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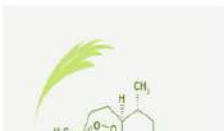
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# A Sustainable Development Approach to Women's Empowerment for Increased Household Economic Independence: Pro-Poor Tourism Concept in an Archipelago Area

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## Abstract

Community-Based Tourism (CBT) in East Sumba highlights its unique natural features through its archipelagic potential, which is synergistically integrated with rich traditional cultural experiences. Island-based CBT faces strategic management challenges, especially in empowering human resources—notably women—amid the inherently vulnerable and fragile nature of island tourism assets. Women's empowerment, a key element of pro-poor tourism, significantly influences poverty reduction and helps address the high rates of stunting in East Sumba. This research aims to examine women's empowerment within archipelago-based CBT management frameworks that impact household economic independence. The study adopts a sustainable tourism approach that involves two systems—the human system and the ecosystem—broken down into four dimensions and 32 indicators to assess the sustainability potential of each. Data analysis uses scoring methods to produce BTS and ATSI diagrams. Findings indicate that CBT in East Sumba falls within the potentially sustainable quadrant on the BTS diagram, with coordinates (6.88, 6.49). The average scores are 7.0 for the human system and 6.44 for the ecosystem, supported by the AMOEBA diagram, which shows broad tendencies. The most critical and vulnerable sustainability indicators include ecosystem integrity—particularly access to clean water—and effective mitigation strategies. Conversely, the indicators with the highest robustness include active women's participation in Family Empowerment and Welfare Organizations and tourism diversification, which is enhanced by East Sumba's strategic location within Indonesia's eastern tourism corridor. Stakeholders can leverage these findings by promoting women's empowerment through integrated tourism package innovations, thereby creating more entrepreneurial opportunities and improving household economic conditions. This research contributes to understanding women's empowerment through sustainable tourism methods, emphasizing its role as a foundation for pro-poor tourism within island-based CBT frameworks.

**Keywords:** women's empowerment; CBT; pro-poor tourism; archipelago tourism; household economic; human system; ecosystem



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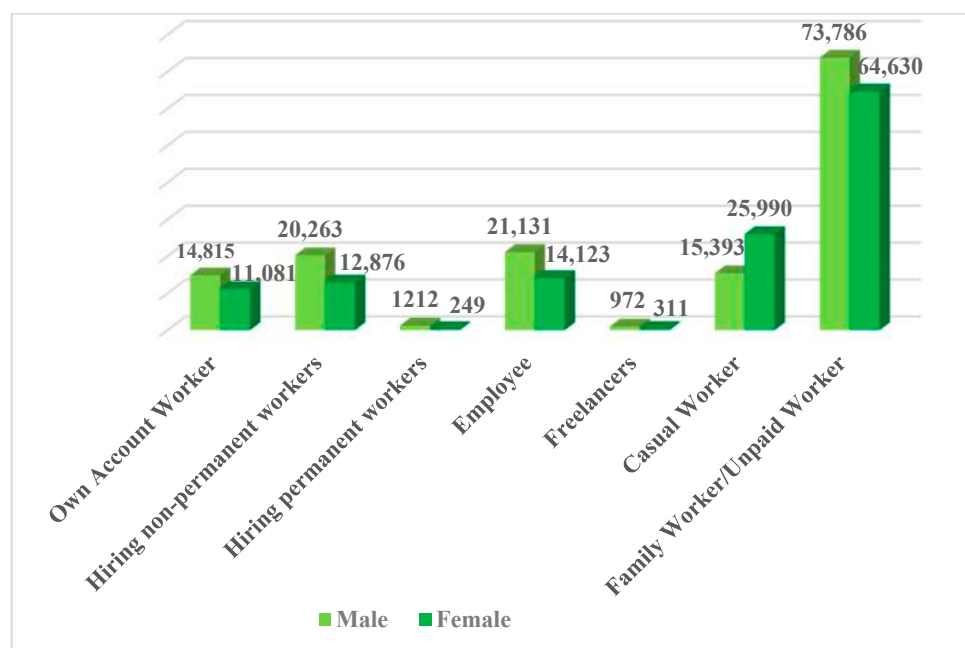
## 1. Introduction

East Sumba is a regency on Sumba Island, East Nusa Tenggara Province, Indonesia. In 2020, East Sumba Regency was classified as a disadvantaged region under Presiden-

tial Regulation No. 63 of 2020. Four years later, in 2024, it was successfully ranked as a developing region based on a decrease in the poverty rate, one of the critical indicators. According to data from the [Central Statistics Agency of East Sumba \(2025\)](#), the poverty rates for 2020, 2021, 2022, and 2023 were 29.65%, 29.68%, 28.22%, and 28.08%, respectively. Beyond these socioeconomic shifts, archipelagic destinations have unique opportunities to develop a strong identity and become resilient in the face of future crises ([Figueroa & Rotarou, 2021](#)). East Sumba Island, with its unique cultural heritage, has high potential for development as a tourist destination to boost its economy and reduce poverty. This potential is further highlighted by the regency's growing tourist appeal, as evident in the increase in foreign and domestic tourists from 2021 to 2023. The number of international tourist visits from 2021 to 2023 was 87 (2021), 813 (2022), and 2121 (2023). Meanwhile, the number of domestic tourist visits was 18,489 (2021), 34,083 (2022), and 50,635 (2023).

The management of island-based tourism potential faces several obstacles, including inadequate infrastructure, limited human resource capacity, weak planning, low local community participation, and a lack of collaboration ([Nashrullah et al., 2025](#)). Island tourism plays a vital role in maritime economic development ([Mo & Qi, 2023](#)), thereby requiring strategies to enhance competitiveness by empowering local communities. Developing sustainable ecotourism service systems is essential for islands that are more vulnerable and easily affected ([Hsiao et al., 2021](#)). The key component of marine ecotourism service systems is management capacity for mitigation, with ecological diversity serving as a core resource. Local communities work with stakeholders to build ecotourism systems that support conservation sustainability and increase tourist satisfaction ([Hsiao et al., 2021](#)). Management of the island focuses on personalized, nature-based experiences to promote sustainable tourism that benefits the local community economy ([Figueroa & Rotarou, 2021](#)). Sustainable tourism management requires an inclusive approach to institutional strengthening and community empowerment. Strengthening community empowerment involves investing in human resource capacity-building, participatory planning, and collaboration among tourism stakeholders to support long-term community welfare ([Nashrullah et al., 2025](#)). Efforts to promote sustainable island tourism often focus on cultural enhancement to attract visitors ([Ge, 2020](#)).

Managing island tourism through local community empowerment is a concept of pro-poor tourism (PPT) ([Yang et al., 2021](#)). PPT has developed since the early 2000s as a concept of sustainable tourism development through local community empowerment. Sustainable island tourism management can drive economic and social transformation ([Cao et al., 2021](#)). PPT can reduce poverty ([Çolak et al., 2023](#)) and have an impact on the environment and society through cooperation between various stakeholders ([Wen et al., 2021](#)). The implementation of PPT without involving the business sector has led to ineffectiveness, stagnation, and the failure of tourism businesses. CSR programs are one form of collaboration to realize PPT, which can harmonize cultural preservation and economic interests to realize sustainable tourism through various innovative initiatives ([Wu et al., 2023](#)). The PPT program is implemented through a social innovation approach and the strengthening of traditions to encourage the transformation of community power structures ([Hazenberget al., 2025](#)). Based on East Sumba statistics for 2024, women's empowerment remains comparatively limited. The majority of women in East Sumba are homemakers without income-generating activities (family workers or unpaid laborers), totaling 64,630, due to restricted opportunities for active participation in industrial sectors ([Central Statistics Agency of East Sumba, 2025](#)). This data demonstrates that most women remain unproductive and unable to contribute to the family's economic reinforcement. Productive-age population statistics are presented in [Figure 1](#).



**Figure 1.** Population 15 Years and Over who Worked During the Previous Week by Main Employment Status and Sex in East Sumba Regency, 2023. Source: (Central Statistics Agency of East Sumba, 2025).

Women's empowerment in East Sumba remains relatively limited due to two main factors: patriarchal norms and educational levels. In some aspects of social life in East Sumba, men still serve as the primary decision-makers in families and communities across various areas of life. Meanwhile, women are seen as holding subordinate roles and are more vulnerable to different forms of violence. Educational attainment in East Sumba is mainly at the primary school level. In 2022 and 2023, it was reported that over 98% of individuals had completed primary education (Central Statistics Agency of East Sumba, 2025). Women's empowerment in East Sumba aims to improve family welfare, thereby helping to lower the persistently high stunting rate, which averaged 15% from 2021 to 2024 (Central Statistics Agency of East Nusa Tenggara Province, 2025). This rate exceeds the government target of below 14%. Women's empowerment through pro-poor tourism management grounded in archipelagic traits is a strategic option for boosting family economics and overall societal conditions.

Sustainable tourism promotes equitable tourism by empowering women in many domains (Jamal & Higham, 2021). Eco-feminist paradigms for eco-cultural justice (Camargo et al., 2016) and feminist epistemological views (Eger et al., 2022) also support women's empowerment. Women's empowerment is key to successful tourism development and to long-term poverty reduction. Examples include Balinese women in indigenous communities. They actively participate in tourism, supporting family resilience while still fulfilling family duties (Adnyani & Purnamawati, 2024). Gender inequality has become a global concern, acting as a barrier to women's empowerment in tourism development. Women are more likely to have insecure jobs, earn less, and have fewer career opportunities (Nanthini & Nair, 2020). Gender inequality began with physical differences; however, it evolved due to social, historical, and cultural factors (Jule, 2014), such as patriarchal restrictions for Arab women (Zuhur, 2003) and Confucian traditions in China (Hao et al., 2021). Gender inequalities block truly sustainable human development, and understanding gender in local contexts is needed. Achieving gender equality helps business development, service quality, and customer satisfaction (Wan & Chan, 2018). Women's empowerment can help

reduce vulnerability and boost resilience and sustainability in the face of global climate and pandemic crises (Kalisch & Cole, 2023).

Sustainable tourism management through the concept of empowerment involves two systems as key indicators; namely, the human system and the ecosystem (Ko, 2005). Human system indicators include politics, economics, socio-culture, and production structures, while ecosystem indicators include environmental impact, ecosystem quality, biodiversity, and environmental policy and management. The presence of women within the human system plays an essential role in realizing sustainable tourism. The tourism industry offers opportunities for women to take on roles within organizational hierarchies (Vujko et al., 2024), contribute innovative ideas or frameworks (McCall & Mearns, 2021), and participate in tourism development planning (Rahmawati & Darwis, 2023). Women's active involvement in tourism-related organizations mainly remains limited to women's groups, such as Family Empowerment and Welfare (Wirdawati et al., 2024).

The achievement of sustainable tourism is shown through economic impacts, especially the creation of entrepreneurial opportunities and the growth of local community economies. Women's empowerment is realized through active involvement in various tourism businesses (McCall & Mearns, 2021), opening doors to start independent businesses (Wardhani & Susilowati, 2021), which in turn leads to increased income (I. Idris et al., 2023; Vukovic et al., 2023), thus supporting household economic independence (Borović et al., 2022). From a social perspective, sustainable tourism creates opportunities for women to participate socially through various tourism industries (Rahmawati & Darwis, 2023). Active involvement in tourism boosts women's self-confidence (Hao et al., 2021), promotes gender equality (Ghimire et al., 2024), raises awareness of the importance of self-development and future generations (Pécot et al., 2024), and fosters increased pride (Rasoolimanesh et al., 2017). Sustainable tourism promotes optimal tourist satisfaction through strengthening service and product quality standards. Tourist experiences are shaped by complex interactions that can encourage tourists to revisit destinations. Sustainable tourism can include products created from environmentally sustainable raw materials, promote environmental and cultural conservation through infrastructure development (El-Manhaly & Taha, 2024), and build on adequate skills and knowledge from local communities (Pécot et al., 2024).

Tourism management produces both positive and negative effects (Butler et al., 2022). The positive aspects of tourism businesses include raising awareness of the importance of protecting the environment and culture. On the other hand, long-term adverse effects can consist of conflicts among local communities (Simpson, 2008), increased waste, and traffic congestion (Pearce & Chen, 2012). Sustainable tourism should create healthy ecosystems, including sufficient water resources, suitable land for tourism activities, and clean air (Yin et al., 2022), as well as the adoption of tourism mitigation strategies (Afifa & Nugroho, 2022). Sustainable tourism is closely linked to tourism diversification (O'Halloran, 2020), which includes traditional cultural uniqueness, handcrafted crafts and culinary arts, and natural attractions found on islands (Mrđa & Carić, 2019). Sustainable tourism involves establishing strong institutions that operate efficiently, uphold development programs and policies regulating tourism growth, and foster effective collaboration with various stakeholders (Kapera, 2018).

The Global Sustainable Tourism Development Council (GSTC) states that sustainable tourism applies four pillars: environmental, economic, social, cultural, and management. Implementing these four pillars benefits local communities and improves destination quality (Borland & Lindgreen, 2013). The conceptualization of sustainable tourism through four pillars is realized through stakeholder synchronization and training programs (Hizmi & Junaid, 2023), which are key to successful sustainable development (Ju-

naid et al., 2022). Tourism environment, as the foundation of sustainable tourism development, encompasses the natural, economic, and social and cultural environments (Ge, 2020). Sustainable tourism development influences environmental conservation, economic development, and social progress (Hernández-Cuevas et al., 2024).

This research examines women's empowerment in island-based CBT located in East Sumba Regency, East Nusa Tenggara. Archipelago tourism has characteristics distinct from those of urban or rural tourism and is more vulnerable to environmental degradation. The findings offer an overview of current conditions related to women's empowerment through CBT management, which influences family economic improvement. CBT, as a model of sustainable tourism, plays a crucial role for both impoverished and non-impoverished households and helps reduce poverty by empowering communities through tourism enterprises (Thomas, 2025). The study provides strategic recommendations for reducing poverty through women's empowerment in tourism businesses, supporting household economic growth and independence. The implications include reconceptualizing women's empowerment in light of the study's findings. The research adds new insights by focusing on women's empowerment in island-based tourism areas to help reduce poverty and promote sustainable tourism goals.

Previous research has examined women's empowerment in CBT (McCall & Mearns, 2021; P. A. Idris & Rahmawati, 2021; El-Manhaly & Taha, 2024), pro-poor tourism (Yang et al., 2021), and archipelago-based tourism (Lewis-Cameron & Brown-Williams, 2022; Figueroa & Rotarou, 2021; Hsiao et al., 2021) in fragmented approaches. This research integrates three tourism management variables, which are assessed using a sustainable tourism methodology—first, women's empowerment as SDG 5: Gender Equality. Second, archipelagic regions are key components of marine tourism, serving as primary attractions in Indonesia, as an archipelagic nation; island tourism offers unique potential but also involves fragile and easily compromised characteristics, which require effective and efficient management strategies. Third, pro-poor tourism as SDG 1: No Poverty. Strategies for poverty alleviation are a strategic concern in eastern Indonesian regions, including East Nusa Tenggara.

## 2. Methodology

### 2.1. Research Design

The research design adopts a descriptive quantitative methodology with a focus on sustainable tourism. The quantitative approach is used to measure indicators of sustainable tourism assessment, covering two systems: the Human System and the Ecosystem. Primary data is collected through observation and interviews to determine scores, while secondary data is obtained from third-party sources, both online and offline. Primary data was collected through Focus Group Discussion (FGD) using survey and interview methods from June to August 2025. The FGD was conducted with approval from the East Sumba Regency Government, dated 10 June 2025, which authorized the Tourism and Culture Office to facilitate the availability of key respondents and informants for data collection. Participants in primary data collection include women involved in tourism management, tourism village managers, tourism awareness groups, village officials, and other relevant stakeholders. Secondary data from third parties was obtained from the tourism office, the central statistics agency, and stakeholders involved in CBT management, including CBT management documents, tourism development programs, and related data. Secondary data was collected over a period of five months, from April to August 2025. The study was carried out in eight tourism villages in East Sumba, located from east to southeast: Kalituda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Lambanapu, and Prailiu. Village selection was based on their characteristics as cultural tourism sites with significant poten-

tial for women's empowerment. The village groups involved in the research are referred to as society.

## 2.2. Data Analysis Techniques

The data analysis technique employs the Barometer of Tourism Sustainability (BTS) and AMOEBA of Tourism Sustainability Indicators (ATSI) methodologies. BTS elucidates the comprehensive sustainability level of human systems and ecosystems (Prescott-Allen, 1997). The sustainability barometer presents a systematic approach to measuring and communicating community welfare and progress toward sustainable development, producing conclusions about human systems and ecosystem conditions, and the effects of human interaction with ecosystems. The BTS methodology provides researchers with the opportunity to select their own indicators to measure humans and ecosystems as an integrated system and to assess the entire system and its components (Guijt et al., 2001). The system barometer presents the sustainability of tourism management in five ratings. These ratings are measured on a score range: Unsustainable Tourism ( $0 \geq X > 2$ ), Potentially Unsustainable Tourism ( $2 \geq X > 4$ ), Intermediate ( $4 \geq X > 6$ ), Potentially Sustainable Tourism ( $6 \geq X > 8$ ), and Sustainable Tourism ( $8 \geq X \leq 10$ ). The barometer also presents the coordinates of measurement results for 32 indicators that describe the sustainability status of tourism management. AMOEBA of Tourism Sustainability Indicators (ATSI) explains the sustainability level of these tourism indicators (Bell & Morse, 1999; Ten et al., 1991). ATSI is the result of measurements from 32 indicators. It is presented in the AMOEBA visualization, which illustrates the level of sustainability: the wider the AMOEBA, the stronger the sustainability. The ATSI visualization design uses a radar chart created in Excel.

BTS and ATSI analysis techniques provide a visual overview of the sustainability conditions of tourism management in a geographical area (Ko, 2005). The BTS and ATSI analysis stages comprise several phases: determining the community; identifying the system, dimensions, and indicators; determining the indicator weights and scales; calculating indicator scores; and presenting the results in visual form. The research employs 32 indicators to measure tourism sustainability, referred to as Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1–2 are assessed as highly unsustainable, ratings 2–4 are evaluated as less sustainable, rating 5 is estimated as neutral, ratings 6–7 are evaluated as potentially sustainable, and ratings 8–10 are assessed as highly sustainable (Sugiyono, 2020). Each indicator is assigned a weighting based on its contribution to the system being measured. The measurement results from 32 indicators, obtained through the rating process, are entered into a table and multiplied by their respective weights to produce a score. The total score for each system produces coordinates that are presented on the Barometer graph, while the rating values are presented in the AMOEBA visualization. Research indicators are formulated based on relevant theoretical foundations, as presented in Table 1.

**Table 1.** Sustainable Indicators (SI).

Society			
Traditional Villages in East Sumba: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Prailiu, Lambanapu			
System	Dimension	Indicators	
The Human System	Politic	SI1	Women occupy strategic positions in organizational management (Vujko et al., 2024)
		SI2	Women have opportunities to express their opinions (McCall & Mearns, 2021)
		SI3	Women participate in tourism development planning (Rahmawati & Darwis, 2023)
		SI4	Women develop women's institutions, such as the Family Welfare Movement (Wirdawati et al., 2024)
	Economic	SI5	Women are actively involved in various tourism business sectors (El-Manhaly & Taha, 2024)
		SI6	Women have opportunities to establish independent businesses in the tourism sector (Wardhani & Susilowati, 2021)
		SI7	Women generate income from tourism to strengthen the economy (Borović et al., 2022)
		SI8	Women experience increased economic independence (Rahmawati & Darwis, 2023)
	Social Dimension	SI9	Women gain self-confidence through tourism involvement (Vujko et al., 2024)
		SI10	Women have opportunities to socialize through tourism businesses (El-Manhaly & Taha, 2024)
		SI11	Women achieve gender equality through the tourism business (Ghimire et al., 2024)
		SI12	Women possess awareness for self-development and future generations (Pécot et al., 2024)
	Production Structure	SI13	Women process environmentally friendly raw materials (El-Manhaly & Taha, 2024)
		SI14	Women play active roles in environmental and cultural conservation (Butler et al., 2022)
		SI15	Women are actively involved in local infrastructure management (El-Manhaly & Taha, 2024)
		SI16	Women possess adequate skills and knowledge (Wirdawati et al., 2024)
The Ecosystem	Environmental Impacts (Butler et al., 2022)	SI17	Fostering awareness to participate in environmental conservation actively
		SI18	Long-term activities impact population density and congestion.
		SI19	Tourism activities potentially generate waste from tourism-related activities.
		SI20	Tourism management potentially triggers conflicts among local communities.
	Ecosystem Quality (Yin et al., 2022)	SI21	Community-Based Tourism (CBT) has adequate water resources
		SI22	CBT has adequate and representative land for the tourism business
		SI23	CBT maintains clean air quality that poses no risk to human health
		SI24	CBT implements tourism mitigation programs
	Tourism diversity (Afifa & Nugroho, 2022)	SI25	CBT possesses a unique traditional culture
		SI26	CBT produces distinctive handicrafts
		SI27	CBT offers distinctive cuisine
		SI28	CBT features natural beauty based on archipelagic characteristics
Environmental Policy and Management (Kapera, 2018)	SI29	CBT maintains healthy governance and executes its functions and responsibilities	
	SI30	CBT implements sustainable tourism development programs	
	SI31	CBT establishes policies that regulate development	
	SI32	CBT maintains extensive cooperation with various stakeholders	

Source: developed from Ko (2005).

### 3. Results

#### 3.1. General Overview of CBT in East Sumba

The research utilizes eight CBTs, including Mondu, Lambanapu, Malumbi, Prailiu, Watuhadang, Rindi, Kaliuda, and Lainjanji. Mondu Village is located in Kanatang District

and covers 90.45 km<sup>2</sup>. The tourism potential of Mondu Village includes savanna landscapes, Mangejing ritual culture, Padadita traditional village, Tanggedu waterfall, Kapihak Beach, and a creative economy through weaving, lontar leaf handicrafts, and statue carving. The population of Mondu Village is 1596, primarily engaged in farming, livestock breeding, and fishing. Lambanapu Village is situated in Kambara District, covering 795 hectares, with a population of 3191. The area is mainly rice fields and agricultural land, so most residents work in farming. Its tourism attractions include the Kambaniru River, the Lambanapu archeological site, the cultural house, weaving, the Tanau and Seribu hills, the Ori Angu Dance Studio, and the Li Luri Studio. Both Mondu and Lambanapu villages are vulnerable to flood disasters. Malumbi Village, located in East Wewewa District, spans 11.2 km<sup>2</sup> with 2467 residents, mostly farmers and artisans. Its tourism potential includes the Kambaniru River and Dam, herbal hills, weaving, betel nut processing sites, and bamboo crafts. Prailiu Village is in Kahaungu Eti District, covering 51 hectares and home to 7874 residents who work as farmers and artisans. Attractions include Prailiu Village, Hamayang (Traditional Ritual), Parunggara tour (Guest Welcome), Hambu marata (bride welcomed in the village of origin), Puru la kamaidu (harvest ceremony), Palupang Djara (Horse Racing), megalithic stones, mangrove tourism, Batu Payung Beach, traditional dance, ikat weaving crafts, and specialty foods like Manggulu, kaparak, instant ginger beverages, and moringa biscuits. Watuhadang Village, in Umalulu District, covers 1020 hectares and has 2954 residents engaged in farming, livestock breeding, and weaving. Its tourism potential includes traditional villages, megalithic graves, traditional houses, pahikung weaving, savanna hills, and the kendingan dance. Watuhadang is relatively safe from natural disasters. Rindi Village, in Rindi District, covers 57 km<sup>2</sup> and has 1702 residents, mainly farmers, livestock breeders, and fishermen. Its attractions consist of noble graves, the tarik bati tradition, the Praiyawang traditional village, and stone carving crafts. The town faces risks from floods and storms. Kaliuda Village, in Pahunga Lodu District, spans 110 hectares and is home to 4238 residents engaged in farming, fishing, livestock breeding, and artisan work. Its tourism appeals include ancestral culture on woven fabrics and Prianu customs, Marapu traditional funeral rituals, megalithic graves, weaving crafts, seaweed farming, the Nalu and Kanggoa Rivers, the Prianu traditional village, Tandening savanna grassland (the longest savanna), and traditional dance. Kaliuda is vulnerable to natural hazards, including floods, tsunamis, and earthquakes. Lainjanji Village, in Wulla Waijilu District, covers 97.2 km<sup>2</sup> with 1500 residents, who mainly work as farmers, plantation workers, and fishermen. The area's attractions include coastal flows and savanna grasslands. The tourism potential consists of the Lainjanji River, Woranu River, Praibakal River, Watuparunu Beach, hot springs, ikat weaving, and seaweed farming.

The selection of these eight CBTs was based on regional characteristics and potential, specifically traditional cultural assets, weaving crafts, and natural resources from the archipelago. Villages known for weaving have significant potential to empower women because most weaving artisans are women. These eight CBTs pose challenges to women's empowerment in tourism management, potentially affecting their families' economic independence. Based on data collected through observation, interviews, and documentation, the assessments of 32 indicators are shown in Table 2.

Table 2 shows the results of sustainable tourism measurements using human systems and ecosystems, covering eight subsystems. The rating value presents measurement results for 32 weighted indicators. The score is calculated by multiplying the weighted value by the rating value. In Table 2, column 1 lists a rating of 6 for the sustainable indicator (SII). The score of 0.5 is the product of the weighted value and the rating value. The total indicator score for the human system is the X-coordinate value. The total score for the ecosystem indicator is the Y-coordinate value, representing the sustainable condition in the Barom-

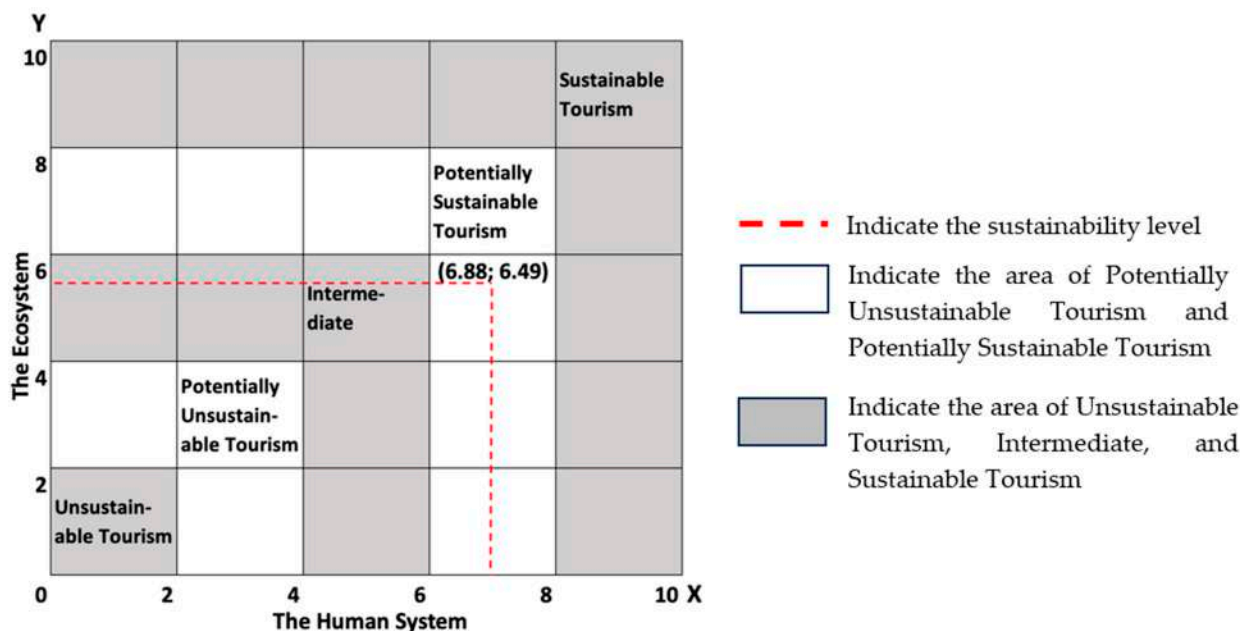
eter graph. The rating value also shows the sustainable condition for each indicator, as presented in the AMOEBA visualization.

**Table 2.** Sustainable Indicator (SI) Assessment.

System	Dimension	Indicator	Weight	Rating	Score	System	Dimension	Indicator	Weight	Rating	Score		
(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)		
The Human System	Politic	SI1	0.08	6.00	0.50	The Ecosystem	Environmental Impacts	SI17	0.07	7.00	0.51		
		SI2	0.06	8.00	0.44			SI18	0.02	4.00	0.10		
		SI3	0.06	6.00	0.33			SI19	0.07	6.00	0.44		
		SI4	0.03	9.00	0.25			SI20	0.05	6.00	0.29		
	Economic	SI5	0.08	7.00	0.58		Ecosystem Quality	SI21	0.07	4.00	0.29		
		SI6	0.03	7.00	0.19			SI22	0.07	6.00	0.44		
		SI7	0.08	6.00	0.50			SI23	0.05	7.00	0.34		
		SI8	0.08	6.00	0.50			SI24	0.07	4.00	0.29		
	Social	SI9	0.06	7.00	0.39		Tourism diversity	SI25	0.07	9.00	0.66		
		SI10	0.06	8.00	0.44			SI26	0.07	9.00	0.66		
		SI11	0.08	8.00	0.67			SI27	0.07	6.00	0.44		
		SI12	0.06	7.00	0.39			SI28	0.05	9.00	0.44		
	Production Structure	SI13	0.08	8.00	0.67		Environmental Policy and Management	SI29	0.07	6.00	0.44		
		SI14	0.06	8.00	0.44			SI30	0.05	6.00	0.29		
		SI15	0.03	5.00	0.14			SI31	0.05	7.00	0.34		
		SI16	0.07	6.00	0.44			SI32	0.07	7.00	0.51		
					$\bar{x} = 7$	$\Sigma = 6.88$						$\bar{x} = 6.44$	$\Sigma = 6.49$

3.2. Quadrant of Sustainability Levels

Based on scoring values in Table 2, the axis value (X; Y) is (6.88; 6.49), which is in the potentially sustainable quadrant, as shown in Figure 2. This quadrant highlights opportunities for sustainable CBT in East Sumba, emphasizing the balance between the Human System and Ecosystem with tourism pentahelix involvement.



**Figure 2.** Barometer of Tourism Sustainability (BTS).

3.3. Sustainability Indicators Value

Based on Table 2, the AMOEBA diagram in Figure 3 illustrates the level of tourism sustainability in East Sumba.

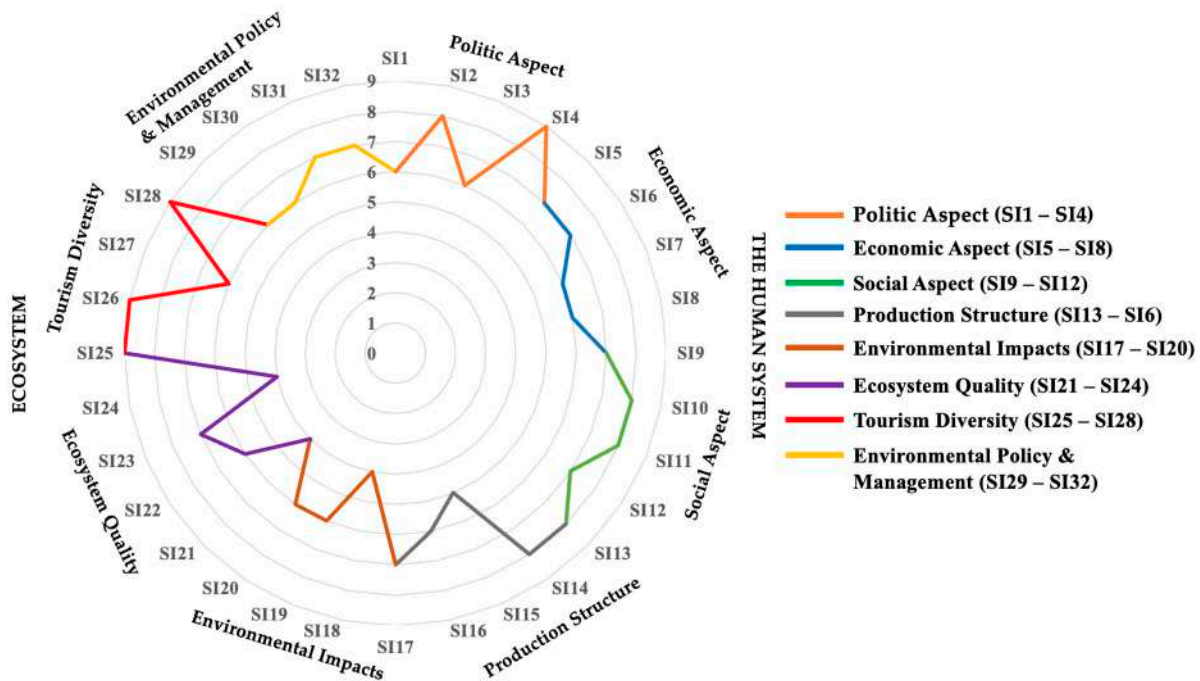


Figure 3. AMOEBA of Tourism Sustainability Indicator (ATSI).

The AMOEBA figure indicates potentially sustainable tourism development on East Sumba Island by its broad coverage. The extent of pseudopodia reflects the magnitude of indicator values: the wider the reach, the higher the value.

## 4. Discussion

### 4.1. Sustainability Level of the Human System in East Sumba Tourism

The human system in sustainable tourism comprises political, economic, social, and production dimensions. Table 2 shows that the average human system assessment is 7, indicating potentially sustainable conditions. However, the women's empowerment indicator in local infrastructure management (SI15) shows relatively low scores of 5. Women's involvement can be improved by making homestay management a central accommodation for CBT. Most CBTs have not provided homestays due to limited staff knowledge and skills, instead renting parts of residents' rooms for tourists. Existing homestays operate independently from residents' houses, resulting in little interaction between tourists and hosts (Wijayanti & Dewi, 2023). Women's empowerment has reached relatively optimal levels in several tourist destinations, such as Bali, Banyuwangi, Bantan, and Yogyakarta, where women play key roles as business managers, tourism promoters, and preservationists (Sirad et al., 2025).

The political aspect is assessed through women's participation in institutions directly and indirectly linked to the tourism industry. As seen in Table 2, the highest rating indicator is 9, indicating that women in East Sumba run an organizational forum through community-based groups focused on family empowerment, specifically the Family Welfare Movement (S14) (Wirdawati et al., 2024). However, women's involvement in tourism-related organizations remains limited, especially in Tourism Awareness Groups and Tourism Village Management bodies. The hierarchy within tourism organizations remains male-dominated, limiting women's roles in planning. Although women have opportunities to share their ideas and opinions verbally and in writing about tourism development (McCall & Mearns, 2021), the management process from planning to oversight is mainly carried out by men. Women's active participation in East Sumba's tourism growth

primarily focuses on tourism business activities, particularly in culinary services, the creative economy, and cultural preservation.

The dimensional indicator measurements shown in Table 2 indicate that while women's empowerment in the tourism industry has reached a sustainable level, its positive impact on economic growth remains limited. This limited impact is partly due to the lack of coordinated and comprehensive support. As a result, women's empowerment efforts remain scattered and do not effectively drive long-term economic development or sustainability. For example, although weaving is a common form of women's empowerment in East Sumba's CBT, the lack of integration across the production and marketing phases limits weavers' ability to increase their income and contribute to broader economic resilience.

Tourism development in East Sumba aims to drive economic growth and improve families' financial independence by empowering women. Women's participation is expected to stimulate tourism growth across the region. As of 2024, 64,630 women in East Sumba are housewives without income—51.94% of the female population and 25.29% of the total population. Women's involvement primarily remains in small-scale operations, with limited roles in starting independent enterprises, which is the main barrier to strengthening the family economy (Borović et al., 2022).

Culinary attractions in East Sumba remain limited in both quantity and quality. The variety of cuisine offered lacks diversity and is presented simply with insufficient representation. Residents produce cuisine in relatively small amounts due to limited market access. Specialty dishes are not consistently available and are often only made upon request or during tourist visits. East Sumba's specialty dishes include Manggolu (made from kepok bananas and peanuts) and Kaparak (made from corn, rice, and sago). Other culinary options include Woba (seaweed) from Kaliuda Village, lobster from Lainjanji Village, and instant ginger beverages and moringa biscuits from Prailiu Village. Women's empowerment in culinary management can be improved through increased training in culinary skills, packaging, and marketing strategies.

Women's active participation in the creative economy and cultural preservation sectors is clear through handicrafts and traditional dances that attract tourists. East Sumba's notable handicrafts include ikat-woven textiles and pahikung, which vary from village to village. Women play key roles as artisans and keepers of weaving history and cultural traditions. East Sumba includes several weaving artisan communities, such as Karaja Sumba, Praiyawang, Pau, Prailiu, Kanatang, and Kaliuda. East Sumba features various unique traditional dances with significant historical importance, often performed during traditional ceremonies and to welcome distinguished guests. These dances, as part of tourism attractions, are curated to offer compelling experiences for visitors. Some of the preserved dances in East Sumba include Hogor Watang from Kaliuda village, Tebe and Dho'a dances from Lainjanji village, Ori Angum Dance Studio and Li Luri Dance Studio from Lambanapu village, and Kendingan Dance from Watuhadang village.

Integrated tourism package development can serve as a strategy to enhance family livelihoods by empowering women in East Sumba. Tourism packages are designed around various potentials in an integrated, thematic approach, encompassing cultural assets, natural resources, the creative economy, culinary offerings, and other potentials, all managed through women's empowerment. Integrated tourism packages offer substantial opportunities for women to participate actively in tourism enterprises, from planning to monitoring. Women have opportunities to develop thematic tourism packages related to weaving, integrated with other tourism potentials, thereby enabling woven fabric products to achieve higher economic value. Tourists demonstrate willingness to pay premium prices for tourism packages because they not only acquire woven fabrics as handicraft

products but also gain historical and cultural experiences with considerable educational value. Thematic tourism packages stimulate economic acceleration by engaging resources in both quantity and quality, including women. Women serving as weaving artisans fulfill dual roles: producing woven fabric, packaging, and presenting products to tourists.

Women in East Sumba recognize that their empowerment in the tourism industry generates substantial social impacts, such as increased gender equality, confidence, and skills. Survey assessment scores of 7 and 8 in Table 2 reflect these outcomes. Through empowerment, women gain wider access to operational and leadership roles within tourism management, leading to greater representation and influence in decision-making. Their active involvement also raises awareness and promotes the development of new knowledge, benefiting both individuals and the community. As women take on greater responsibility in tourism, they help foster a more inclusive and equitable industry, enabling broader participation and social progress.

The production structure dimension, which encompasses both services and high-quality products, is a key element supporting the sustainability of the tourism area. Service elements are closely connected to human resource capacity as the leading actors in tourism management (Wirdawati et al., 2024). Success in CBT management heavily depends on local human resource capacity since it operates by, from, and for the community. In Table 2, ratings for indicators related to women's involvement in local infrastructure management and to skills and knowledge in the tourism sector remain relatively low. This is supported by East Sumba Regency data from 2024, showing that community education is primarily at the primary school level, accounting for over 98%. Improving human resource capacity is a critical, urgent step toward sustainable tourism. The quality of tourism products depends on effective management systems supported by sufficient infrastructure (El-Manhaly & Taha, 2024). In East Sumba, local infrastructure in tourism areas is still limited in both availability and accessibility. Restroom facilities, which are essential amenities for tourists, are scarce and often in poor condition. Increased involvement from various stakeholders is needed to accelerate the development of tourism infrastructure and enhance human resource capacity. Stakeholder programs related to infrastructure development include CSR efforts from Sarana Multi Infrastruktur (SMI) in partnership with Universitas Bina Sarana Informatika (UBSI). SMI has helped build restrooms, food courts, UV curing equipment for weaving, and water wells in Watuhadang village. At the same time, UBSI has provided training and support to boost human resource capacity.

According to Table 2, women's empowerment receives high ratings in the processing of environmentally sustainable raw materials and in conservation efforts. Women actively participate in cultural conservation by maintaining weaving traditions and preserving traditional dances (Butler et al., 2022). The use of naturally sourced coloring materials for dyeing threads to be woven into fabrics, such as *Morinda citrifolia* roots, indigo leaves, tree bark, and clay, further demonstrates engagement with sustainable practices.

#### 4.2. Sustainability Ecosystem Level in Tourism Development in East Sumba Tourism

The second system in sustainable tourism comprises the ecosystem, consisting of four dimensions: Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Based on Table 2 data, the average rating value is 6.43, which overall falls within the potentially sustainable category. However, three indicators are considered less sustainable: long-term congestion potential (S118), adequate water availability (SI21), and tourism mitigation implementation (S124).

Tourism management in East Sumba generates both positive and negative consequences. Generally, tourism activities in East Sumba can foster local community awareness of the importance of environmental and cultural preservation as primary products of

the tourism industry. Meanwhile, negative impacts of tourism activities include potential congestion from increased tourist flows, challenges in waste management, and conflicts among local communities (Butler et al., 2022). Waste issues in East Sumba are already becoming apparent, despite tourist visitation flows not yet being substantial. Plastic waste problems are increasingly exacerbating environmental pollution on land and at sea, as adequate waste management systems remain absent. From an institutional perspective, tourism management potentially triggers conflicts within local communities. The primary factors driving internal conflicts include dysfunctional institutions, a lack of transparency, and unclear programming.

The Ecosystem Quality dimension encompasses water resources, land, clean air, and tourism mitigation (Yin et al., 2022). East Sumba is a tourist area with extensive land and clean air, thanks to low pollution levels. In certain areas, water availability remains a fundamental challenge due to hilly terrain and the risk of drought. Natural springs constitute one water source for meeting community needs. Drought is the primary disaster threat to the East Sumba region, while other threats include floods, earthquakes, and tornadoes. Disaster issues in any area significantly influence tourist interest, necessitating robust mitigation as security assurance for tourists. Tourism mitigation in the East Sumba region has not yet been implemented optimally.

The Tourism Diversity dimension constitutes the primary attraction for tourists, including cultural uniqueness, handicrafts, culinary offerings, and natural beauty. The East Sumba region offers diverse and unique cultural tourism attractions, including traditional dances and customary ceremonies, which are still preserved by local communities (Afifa & Nugroho, 2022). One customary ceremony that continues is the death ritual according to Marapu beliefs. This ceremony aims to escort the deceased's soul to the afterlife, where the body can be preserved for years because families must prepare substantial costs for the burial procession. East Sumba offers weaving crafts that access international markets. Woven textiles are created by predominantly female craftspeople and feature various motifs that each possess its own philosophical significance. The culinary offerings remain severely limited, though some areas offer various fish preparations made from fishery products from the archipelagic region. East Sumba is an archipelagic region with significant marine natural resources, including beaches and fisheries. Beach potential attracts tourists with several characteristics, including sea-oriented interests and family travel patterns. The attractions offered by beach potential include striking natural scenery, exotic wildlife, and culture (Hall & Page, 2009), as well as atmospheric freedom, peaceful environments, and local cuisine (Sharpley, 2012).

Sustainable tourism cannot be realized without the Environmental Policy and Management dimension, as an aspect ensuring system functionality. The Environmental Policy and Management dimension includes healthy institutions, development programs, policies, and cooperation with various parties (Kapera, 2018). The Environmental Policy and Management dimension is potentially sustainable with average values of 6 and 7. The institutions managing tourism in East Sumba remain suboptimal, as evidenced by weak administration, ineffective management, and a lack of work programs. Tourism awareness group organizations and CBT managers, as organizations with distinct functions and roles, are often perceived as identical. This incorrect perspective regarding these organizations potentially triggers conflicts in tourism management. Tourism management remains incidental, lacking short-term, medium-term, and long-term planning, which can lead to unsustainable tourism. The government plays an important role in realizing sustainable tourism through policies that serve as references and protection in tourism management. The East Sumba district government, in general, and the Tourism Office, specifically, must issue policies for tourism management and conduct regular training and assistance programs.

The government represents one of the pentahelix elements that collaborate to support tourism management in East Sumba. Other pentahelix elements include academia, business, community, and media. The role of each pentahelix element in East Sumba tourism development includes: government as the policymaker and facilitator; academia supporting human resource capacity building; business supporting infrastructure development acceleration and capital provision; community supporting management systems; and media supporting publication as components of promotion and marketing. The government's role as policymaker is crucial to ensuring legal protection in island-based CBT management, which is vulnerable to degradation, and to optimizing women's empowerment.

#### *4.3. The Harmonization Between the Human System and the Ecosystem of Sustainable Tourism Development in East Sumba*

The Barometer Figure shows the potentially sustainable quadrant, indicating that CBT in East Sumba offers opportunities for sustainable tourism development through efforts to balance the Human System and Ecosystem, facilitated by tourism pentahelix involvement. Collaboration with various parties can accelerate the optimization of sustainable indicators with low ratings. The potentially sustainable condition can decline to the intermediate quadrant or even to unsustainable status if strategic improvement efforts involving various stakeholders are absent. Women as resources become a strategic alternative for realizing sustainable tourism through optimal empowerment. Several aspects that remain unbalanced in sustainable tourism optimization are as follows: (1) Despite gender equality efforts, women in East Sumba have not yet received opportunities to hold management positions, have not received operational roles, and cannot manage businesses independently; (2). Despite efforts to realize ideal institutions, tourism institutions, such as tourism awareness groups and tourism village managers, have not yet implemented administrative procedures, lack transparency, and have no work programs; (3) Despite efforts to build quality ecosystems, mitigation systems are not yet sufficiently robust and water availability is inadequate; (4) Despite waste management efforts, plastic elements are still utilized in food and beverage packaging; (5). Despite efforts to increase tourist attractions, culinary processing using local raw materials remains minimal.

Based on the AMOEBA diagram, small pseudopodia are reaching with a rating value of 4, signifying a less sustainable status, namely indicators for long-term activities impacting density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Limited human resources and capital in tourism management are among the obstacles to securing adequate water supplies and mitigation systems. Therefore, it is crucial for all stakeholders to actively collaborate and take decisive steps to accelerate sustainable tourism management.

Pseudopodia with extensive reach maintain a rating value of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), possess unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and exhibit archipelago-based natural beauty potential (SI28). Women in Sumba have ample opportunity to play an active role in women's organizations; namely, as administrators in organizations for family empowerment and welfare. Sumba women play an important role as preservers of Sumba's cultural heritage, as weavers of traditional fabrics. For the most part, women use weaving to generate income and improve their families' economic situation. The AMOEBA diagram is a tool for assessing the sustainability of community indicators by measuring their relative strengths and weaknesses. Based on this diagram, small pseudopodia reached a ranking value of 4, indicating a less sustainable status, namely indicators of long-term activities that affect density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Pseudopodia with a wide reach maintain a rating of 9, indicating that women are developing institutions such as the Family Welfare

Movement (SI4), have unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and demonstrate the potential for archipelago-based natural beauty (SI28).

#### 4.4. Sustainable Tourism in East Sumba Archipelago Through Women's Empowerment

Women's empowerment in realizing tourism in East Sumba is achieved through active participation in CBT management, from planning to monitoring. Women's involvement in CBT management in East Sumba remains limited and has not had a significant impact on families' or society's economic development. Optimization of women's empowerment is expected to reduce the still-elevated stunting rates on East Sumba Island. CBT represents a tourism development pattern that emphasizes local community empowerment to improve their economies through tourism business management (Steinicke & Neuburger, 2012). Empowering East Sumba communities, especially women, is fundamental to evaluating the achievements of tourism development. The most crucial empowerment component is empowered human resources, effectively managed to achieve development objectives (Abdullah et al., 2022). Women's empowerment becomes a strategic issue in East Sumba because it supports long-term, significant relationships with poverty alleviation and the reduction in stunting rates. This assertion aligns with Adnyani and Purnamawati's (2024) research, which states that women's roles in indigenous communities in managing Balinese cultural tourism impact family economic resilience. Women in Bali fulfill dual roles by actively participating in various tourism businesses without abandoning family responsibilities.

Women's empowerment in the East Nusa Tenggara region faces various obstacles, including limited capital, unequal employment opportunities, and social gender stereotypes. However, there are significant opportunities for women to increase their participation in the tourism industry, potentially improving their welfare. Implementing inclusive tourism in the East Nusa Tenggara region can generate economic benefits for local communities.

#### 4.5. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago

East Sumba, as an archipelagic region, possesses tourism potential that could serve as an economic driver. Island potential packaged as tourism packages in CBT management can improve family economic independence. Sustainable tourism plays a role in poverty alleviation by emphasizing several factors, including environmental factors (Neto, 2003), social factors, and political factors (Hall & Page, 2009). PPT can serve as an effective poverty alleviation tool and supports tentative steps to realize its potential. PPT implementation using sustainable development approaches, through stakeholder involvement in corporate social responsibility, significantly impacts poverty alleviation (Diego et al., 2016).

Low PPT implementation in the business sector hinders tourism from fulfilling its role effectively, leading to stagnation and failure. Business sector involvement through CSR programs provides internal and external company benefits that impact economic, socio-cultural, and environmental aspects. Internal benefits include building reputation and business sustainability through improved company image and customer loyalty. External benefits include sustainable development as corporate social responsibility toward broader society (Diego et al., 2016). CSR's role in tourism development on East Sumba Island remains relatively modest. One CSR entity involved in tourism management on East Sumba Island, SMI, is an Indonesian State-Owned Enterprise operating in infrastructure financing. SMI's CSR program supports sustainable tourism development in Watuhadang Village by enhancing the quality of creative economy products in the weaving and culinary sectors, improving restroom facilities, and increasing water availability through borehole construction. PT SMI constructed UV-curing equipment for weaving craftspeople to accelerate drying during the production of woven fabrics. UV Curing availability significantly

helps craftspeople improve product quality and quantity. Food court construction enables the optimization of women's empowerment in the culinary sector, from raw material processing and planning to product marketing. Meanwhile, borehole construction promotes ecosystem quality by ensuring adequate water availability to support tourism activities. Access to clean water is a key issue in the East Sumba region, which is highly vulnerable to drought disasters.

CSR programs that can contribute positively to poverty alleviation possess several characteristics: suitability for impoverished rural areas; labor-intensive approaches; empowerment of women and communities representing economically disadvantaged populations; and encouragement of tourism activities that create business opportunities (Spenceley & Meyer, 2012). CSR describes a multifaceted concept encompassing four categories of community expectations (Carroll, 2017): (1) economic expectations (i.e., companies should be profitable), (2) legal expectations (i.e., companies should operate within legal boundaries), (3) ethical expectations (i.e., business operations should meet specific ethical standards not required by law), and (4) philanthropic or discretionary expectations (i.e., companies should voluntarily contribute to addressing social needs, including poverty alleviation). CSR activities are voluntary, so companies bear consequences for their ethical or philanthropic responsibilities (Inoue & Lee, 2011). CSR maintains a substantial role in poverty alleviation through 'pro-poor CSR' programs. Pro-poor CSR encompasses several key initiatives, including poverty reduction, fostering relationships with local suppliers and informal sectors, promoting sustainable tourism practices, and preserving the natural environment of economically disadvantaged communities. Companies can collaborate with secondary stakeholders such as NGOs, government institutions, and international organizations (Smith & Ong, 2015).

## 5. Conclusions

Women represent a significant potential resource in East Sumba, given their considerable numbers and their status as unpaid family workers. Women's empowerment in East Sumba becomes a strategic issue due to cultural traditions and persistently strong patriarchal perspectives (Swari, 2023). Women play crucial roles in achieving family economic independence and reducing stunting rates through their involvement in tourism businesses. Tourism empowerment is measured through sustainable tourism approaches that encompass two inseparable systems: the human system and the ecosystem. The human system encompasses four key dimensions: political, economic, social, and production structure.

In contrast, the ecosystem comprises Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Each dimension contains four indicators, resulting in 32 indicators for measuring tourism sustainability levels in East Sumba. Based on scoring results for 32 indicators, tourism in East Sumba falls within the potentially sustainable category, with opportunities for sustainability through adjustments and strengthening several indicators. This research provides strategic recommendations to advance sustainable tourism, focusing on inclusive tourism through women's empowerment, the creation of thematic, integrated archipelago-based tourism packages, the establishment of healthy CBT institutions, and the strengthening of Pentahelix cooperation.

The theoretical implication of this research is to enrich references on women's empowerment in island tourism areas. The references offer concepts of inclusive and pro-poor tourism management. Island tourism areas have unique and vulnerable characteristics, so this study is expected to provide strategic references. In practical terms, this study provides an overview of the sustainability of tourism developed in the Sumba Island tourism area through women's empowerment. The existing conditions serve as a reference for

relevant stakeholders to formulate plans for Sumba women's participation in supporting sustainable tourism management.

This study offers several recommendations for women's empowerment in CBT across the archipelago. The implication of this research is to provide a broader understanding for various stakeholders, especially women, thereby increasing their involvement in the tourism industry. The active participation of women in the tourism business specifically increases family economic independence and, more generally, influences the financial movement of local communities in East Sumba Regency. Family economic independence in the short- and medium-term can significantly reduce stunting rates.

This research has limitations in geographic coverage, making it difficult for researchers to reach all tourist villages in East Sumba Regency. East Sumba Regency has 14 tourist villages that are relatively far apart, and internet access is limited, which poses an obstacle to data collection. Researchers need time and effort to obtain representative data. The research involved only two systems—namely, the Human System and the Ecosystem, each comprising eight dimensions and 32 indicators. Future research is expected to reach 14 tourist villages in East Sumba Regency. The research dimension can be enriched by including other under-researched areas, such as sociopreneurship and investment in CBT development.

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## Abbreviations

The following abbreviations are used in this manuscript:

CBT	Community-Based Tourism
PPT	Pro-Poor Tourism
CSR	Corporate Social Responsibility
BTS	Barometer of Tourism Sustainability
ATSI	AMOEBAs of Tourism Sustainability Indicators
SI	Sustainability Indicator
SMI	Sarana Multi Infrastruktur
UBSI	Universitas Bina Sarana Informatika

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## Article

# A Sustainable Development Approach to Women's Empowerment for Increased Household Economic Independence: Pro-Poor Tourism Concept in an Archipelago Area

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## Abstract

Community-Based Tourism (CBT) in East Sumba highlights its unique natural features through its archipelagic potential, which is synergistically integrated with rich traditional cultural experiences. Island-based CBT faces strategic management challenges, especially in empowering human resources—notably women—amid the inherently vulnerable and fragile nature of island tourism assets. Women's empowerment, a key element of pro-poor tourism, significantly influences poverty reduction and helps address the high rates of stunting in East Sumba. This research aims to examine women's empowerment within archipelago-based CBT management frameworks that impact household economic independence. The study adopts a sustainable tourism approach that involves two systems—the human system and the ecosystem—broken down into four dimensions and 32 indicators to assess the sustainability potential of each. Data analysis uses scoring methods to produce BTS and ATSI diagrams. Findings indicate that CBT in East Sumba falls within the potentially sustainable quadrant on the BTS diagram, with coordinates (6.88, 6.49). The average scores are 7.0 for the human system and 6.44 for the ecosystem, supported by the AMOEBA diagram, which shows broad tendencies. The most critical and vulnerable sustainability indicators include ecosystem integrity—particularly access to clean water—and effective mitigation strategies. Conversely, the indicators with the highest robustness include active women's participation in Family Empowerment and Welfare Organizations and tourism diversification, which is enhanced by East Sumba's strategic location within Indonesia's eastern tourism corridor. Stakeholders can leverage these findings by promoting women's empowerment through integrated tourism package innovations, thereby creating more entrepreneurial opportunities and improving household economic conditions. This research contributes to understanding women's empowerment through sustainable tourism methods, emphasizing its role as a foundation for pro-poor tourism within island-based CBT frameworks.

**Keywords:** women's empowerment; CBT; pro-poor tourism; archipelago tourism; household economic; human system; ecosystem

## 1. Introduction

East Sumba is a regency on Sumba Island, East Nusa Tenggara Province, Indonesia. In 2020, East Sumba Regency was classified as a disadvantaged region under Presiden-



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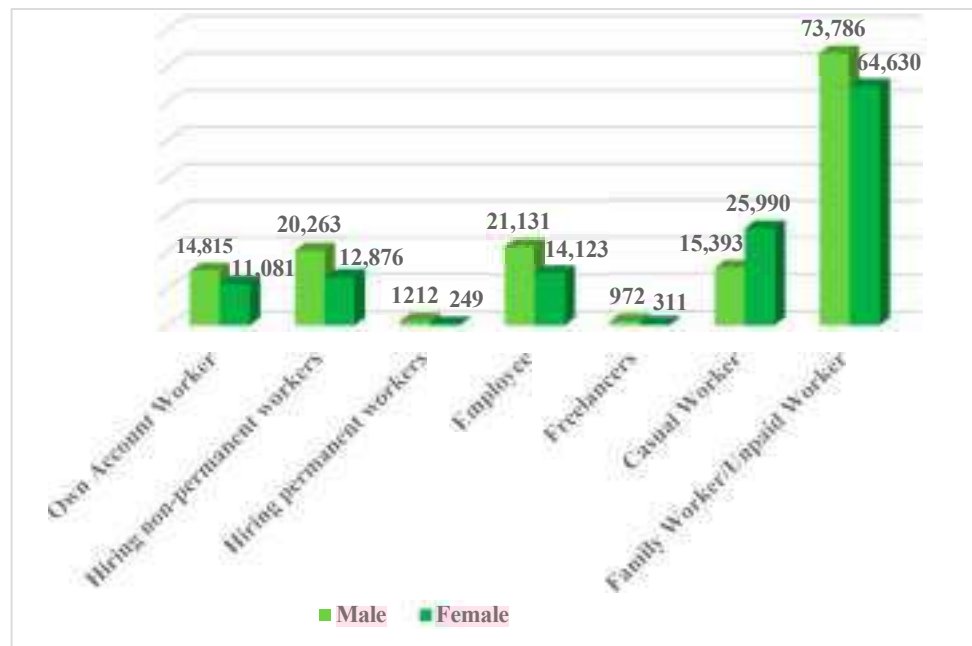
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tial Regulation No. 63 of 2020. Four years later, in 2024, it was successfully ranked as a developing region based on a decrease in the poverty rate, one of the critical indicators. According to data from the [Central Statistics Agency of East Sumba \(2025\)](#), the poverty rates for 2020, 2021, 2022, and 2023 were 29.65%, 29.68%, 28.22%, and 28.08%, respectively. Beyond these socioeconomic shifts, archipelagic destinations have unique opportunities to develop a strong identity and become resilient in the face of future crises ([Figueroa & Rotarou, 2021](#)). East Sumba Island, with its unique cultural heritage, has high potential for development as a tourist destination to boost its economy and reduce poverty. This potential is further highlighted by the regency's growing tourist appeal, as evident in the increase in foreign and domestic tourists from 2021 to 2023. The number of international tourist visits from 2021 to 2023 was 87 (2021), 813 (2022), and 2121 (2023). Meanwhile, the number of domestic tourist visits was 18,489 (2021), 34,083 (2022), and 50,635 (2023).

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The management of island-based tourism potential faces several obstacles, including inadequate infrastructure, limited human resource capacity, weak planning, low local community participation, and a lack of collaboration ([Nashrullah et al., 2025](#)). Island tourism plays a vital role in maritime economic development ([Mo & Qi, 2023](#)), thereby requiring strategies to enhance competitiveness by empowering local communities. Developing sustainable ecotourism service systems is essential for islands that are more vulnerable and easily affected ([Hsiao et al., 2021](#)). The key component of marine ecotourism service systems is management capacity for mitigation, with ecological diversity serving as a core resource. Local communities work with stakeholders to build ecotourism systems that support conservation sustainability and increase tourist satisfaction ([Hsiao et al., 2021](#)). Management of the island focuses on personalized, nature-based experiences to promote sustainable tourism that benefits the local community economy ([Figueroa & Rotarou, 2021](#)). Sustainable tourism management requires an inclusive approach to institutional strengthening and community empowerment. Strengthening community empowerment involves investing in human resource capacity-building, participatory planning, and collaboration among tourism stakeholders to support long-term community welfare ([Nashrullah et al., 2025](#)). Efforts to promote sustainable island tourism often focus on cultural enhancement to attract visitors ([Ge, 2020](#)).

Managing island tourism through local community empowerment is a concept of pro-poor tourism (PPT) ([Yang et al., 2021](#)). PPT has developed since the early 2000s as a concept of sustainable tourism development through local community empowerment. Sustainable island tourism management can drive economic and social transformation ([Cao et al., 2021](#)). PPT can reduce poverty ([Çolak et al., 2023](#)) and have an impact on the environment and society through cooperation between various stakeholders ([Wen et al., 2021](#)). The implementation of PPT without involving the business sector has led to ineffectiveness, stagnation, and the failure of tourism businesses. CSR programs are one form of collaboration to realize PPT, which can harmonize cultural preservation and economic interests to realize sustainable tourism through various innovative initiatives ([Wu et al., 2023](#)). The PPT program is implemented through a social innovation approach and the strengthening of traditions to encourage the transformation of community power structures ([Hazenberget al., 2025](#)). Based on East Sumba statistics for 2024, women's empowerment remains comparatively limited. The majority of women in East Sumba are homemakers without income-generating activities (family workers or unpaid laborers), totaling 64,630, due to restricted opportunities for active participation in industrial sectors ([Central Statistics Agency of East Sumba, 2025](#)). This data demonstrates that most women remain unproductive and unable to contribute to the family's economic reinforcement. Productive-age population statistics are presented in [Figure 1](#).



**Figure 1.** Population 15 Years and Over who Worked During the Previous Week by Main Employment Status and Sex in East Sumba Regency, 2023. Source: (Central Statistics Agency of East Sumba, 2025).

Women’s empowerment in East Sumba remains relatively limited due to two main factors: patriarchal norms and educational levels. In some aspects of social life in East Sumba, men still serve as the primary decision-makers in families and communities across various areas of life. Meanwhile, women are seen as holding subordinate roles and are more vulnerable to different forms of violence. Educational attainment in East Sumba is mainly at the primary school level. In 2022 and 2023, it was reported that over 98% of individuals had completed primary education (Central Statistics Agency of East Sumba, 2025). Women’s empowerment in East Sumba aims to improve family welfare, thereby helping to lower the persistently high stunting rate, which averaged 15% from 2021 to 2024 (Central Statistics Agency of East Nusa Tenggara Province, 2025). This rate exceeds the government target of below 14%. Women’s empowerment through pro-poor tourism management grounded in archipelagic traits is a strategic option for boosting family economics and overall societal conditions.

Sustainable tourism promotes equitable tourism by empowering women in many domains (Jamal & Higham, 2021). Eco-feminist paradigms for eco-cultural justice (Camargo et al., 2016) and feminist epistemological views (Eger et al., 2022) also support women’s empowerment. Women’s empowerment is key to successful tourism development and to long-term poverty reduction. Examples include Balinese women in indigenous communities. They actively participate in tourism, supporting family resilience while still fulfilling family duties (Adnyani & Purnamawati, 2024). Gender inequality has become a global concern, acting as a barrier to women’s empowerment in tourism development. Women are more likely to have insecure jobs, earn less, and have fewer career opportunities (Nanthini & Nair, 2020). Gender inequality began with physical differences; however, it evolved due to social, historical, and cultural factors (Jule, 2014), such as patriarchal restrictions for Arab women (Zuhur, 2003) and Confucian traditions in China (Hao et al., 2021). Gender inequalities block truly sustainable human development, and understanding gender in local contexts is needed. Achieving gender equality helps business development, service quality, and customer satisfaction (Wan & Chan, 2018). Women’s empowerment can help

reduce vulnerability and boost resilience and sustainability in the face of global climate and pandemic crises (Kalisch & Cole, 2023).

Sustainable tourism management through the concept of empowerment involves two systems as key indicators; namely, the human system and the ecosystem (Ko, 2005). Human system indicators include politics, economics, socio-culture, and production structures, while ecosystem indicators include environmental impact, ecosystem quality, biodiversity, and environmental policy and management. The presence of women within the human system plays an essential role in realizing sustainable tourism. The tourism industry offers opportunities for women to take on roles within organizational hierarchies (Vujko et al., 2024), contribute innovative ideas or frameworks (McCall & Mearns, 2021), and participate in tourism development planning (Rahmawati & Darwis, 2023). Women's active involvement in tourism-related organizations mainly remains limited to women's groups, such as Family Empowerment and Welfare (Wirdawati et al., 2024).

The achievement of sustainable tourism is shown through economic impacts, especially the creation of entrepreneurial opportunities and the growth of local community economies. Women's empowerment is realized through active involvement in various tourism businesses (McCall & Mearns, 2021), opening doors to start independent businesses (Wardhani & Susilowati, 2021), which in turn leads to increased income (I. Idris et al., 2023; Vukovic et al., 2023), thus supporting household economic independence (Borović et al., 2022). From a social perspective, sustainable tourism creates opportunities for women to participate socially through various tourism industries (Rahmawati & Darwis, 2023). Active involvement in tourism boosts women's self-confidence (Hao et al., 2021), promotes gender equality (Ghimire et al., 2024), raises awareness of the importance of self-development and future generations (Pécot et al., 2024), and fosters increased pride (Rasoolimanesh et al., 2017). Sustainable tourism promotes optimal tourist satisfaction through strengthening service and product quality standards. Tourist experiences are shaped by complex interactions that can encourage tourists to revisit destinations. Sustainable tourism can include products created from environmentally sustainable raw materials, promote environmental and cultural conservation through infrastructure development (El-Manhaly & Taha, 2024), and build on adequate skills and knowledge from local communities (Pécot et al., 2024).

Tourism management produces both positive and negative effects (Butler et al., 2022). The positive aspects of tourism businesses include raising awareness of the importance of protecting the environment and culture. On the other hand, long-term adverse effects can consist of conflicts among local communities (Simpson, 2008), increased waste, and traffic congestion (Pearce & Chen, 2012). Sustainable tourism should create healthy ecosystems, including sufficient water resources, suitable land for tourism activities, and clean air (Yin et al., 2022), as well as the adoption of tourism mitigation strategies (Afifa & Nugroho, 2022). Sustainable tourism is closely linked to tourism diversification (O'Halloran, 2020), which includes traditional cultural uniqueness, handcrafted crafts and culinary arts, and natural attractions found on islands (Mrđa & Carić, 2019). Sustainable tourism involves establishing strong institutions that operate efficiently, uphold development programs and policies regulating tourism growth, and foster effective collaboration with various stakeholders (Kapera, 2018).

The Global Sustainable Tourism Development Council (GSTC) states that sustainable tourism applies four pillars: environmental, economic, social, cultural, and management. Implementing these four pillars benefits local communities and improves destination quality (Borland & Lindgreen, 2013). The conceptualization of sustainable tourism through four pillars is realized through stakeholder synchronization and training programs (Hizmi & Junaid, 2023), which are key to successful sustainable development (Ju-

naid et al., 2022). Tourism environment, as the foundation of sustainable tourism development, encompasses the natural, economic, and social and cultural environments (Ge, 2020). Sustainable tourism development influences environmental conservation, economic development, and social progress (Hernández-Cuevas et al., 2024).

This research examines women's empowerment in island-based CBT located in East Sumba Regency, East Nusa Tenggara. Archipelago tourism has characteristics distinct from those of urban or rural tourism and is more vulnerable to environmental degradation. The findings offer an overview of current conditions related to women's empowerment through CBT management, which influences family economic improvement. CBT, as a model of sustainable tourism, plays a crucial role for both impoverished and non-impoverished households and helps reduce poverty by empowering communities through tourism enterprises (Thomas, 2025). The study provides strategic recommendations for reducing poverty through women's empowerment in tourism businesses, supporting household economic growth and independence. The implications include reconceptualizing women's empowerment in light of the study's findings. The research adds new insights by focusing on women's empowerment in island-based tourism areas to help reduce poverty and promote sustainable tourism goals.

Previous research has examined women's empowerment in CBT (McCall & Mearns, 2021; P. A. Idris & Rahmawati, 2021; El-Manhaly & Taha, 2024), pro-poor tourism (Yang et al., 2021), and archipelago-based tourism (Lewis-Cameron & Brown-Williams, 2022; Figueroa & Rotarou, 2021; Hsiao et al., 2021) in fragmented approaches. This research integrates three tourism management variables, which are assessed using a sustainable tourism methodology—first, women's empowerment as SDG 5: Gender Equality. Second, archipelagic regions are key components of marine tourism, serving as primary attractions in Indonesia, as an archipelagic nation; island tourism offers unique potential but also involves fragile and easily compromised characteristics, which require effective and efficient management strategies. Third, pro-poor tourism as SDG 1: No Poverty. Strategies for poverty alleviation are a strategic concern in eastern Indonesian regions, including East Nusa Tenggara.

## 2. Methodology

### 2.1. Research Design

The research design adopts a descriptive quantitative methodology with a focus on sustainable tourism. The quantitative approach is used to measure indicators of sustainable tourism assessment, covering two systems: the Human System and the Ecosystem. Primary data is collected through observation and interviews to determine scores, while secondary data is obtained from third-party sources, both online and offline. Primary data was collected through Focus Group Discussion (FGD) using survey and interview methods from June to August 2025. The FGD was conducted with approval from the East Sumba Regency Government, dated 10 June 2025, which authorized the Tourism and Culture Office to facilitate the availability of key respondents and informants for data collection. Participants in primary data collection include women involved in tourism management, tourism village managers, tourism awareness groups, village officials, and other relevant stakeholders. Secondary data from third parties was obtained from the tourism office, the central statistics agency, and stakeholders involved in CBT management, including CBT management documents, tourism development programs, and related data. Secondary data was collected over a period of five months, from April to August 2025. The study was carried out in eight tourism villages in East Sumba, located from east to southeast: Kalituda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Lambanapu, and Prailiu. Village selection was based on their characteristics as cultural tourism sites with significant poten-

tial for women's empowerment. The village groups involved in the research are referred to as society.

## 2.2. Data Analysis Techniques

The data analysis technique employs the Barometer of Tourism Sustainability (BTS) and AMOEBA of Tourism Sustainability Indicators (ATSI) methodologies. BTS elucidates the comprehensive sustainability level of human systems and ecosystems (Prescott-Allen, 1997). The sustainability barometer presents a systematic approach to measuring and communicating community welfare and progress toward sustainable development, producing conclusions about human systems and ecosystem conditions, and the effects of human interaction with ecosystems. The BTS methodology provides researchers with the opportunity to select their own indicators to measure humans and ecosystems as an integrated system and to assess the entire system and its components (Guijt et al., 2001). The system barometer presents the sustainability of tourism management in five ratings. These ratings are measured on a score range: Unsustainable Tourism ( $0 \geq X > 2$ ), Potentially Unsustainable Tourism ( $2 \geq X > 4$ ), Intermediate ( $4 \geq X > 6$ ), Potentially Sustainable Tourism ( $6 \geq X > 8$ ), and Sustainable Tourism ( $8 \geq X \leq 10$ ). The barometer also presents the coordinates of measurement results for 32 indicators that describe the sustainability status of tourism management. AMOEBA of Tourism Sustainability Indicators (ATSI) explains the sustainability level of these tourism indicators (Bell & Morse, 1999; Ten et al., 1991). ATSI is the result of measurements from 32 indicators. It is presented in the AMOEBA visualization, which illustrates the level of sustainability: the wider the AMOEBA, the stronger the sustainability. The ATSI visualization design uses a radar chart created in Excel.

BTS and ATSI analysis techniques provide a visual overview of the sustainability conditions of tourism management in a geographical area (Ko, 2005). The BTS and ATSI analysis stages comprise several phases: determining the community; identifying the system, dimensions, and indicators; determining the indicator weights and scales; calculating indicator scores; and presenting the results in visual form. The research employs 32 indicators to measure tourism sustainability, referred to as Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1–2 are assessed as highly unsustainable, ratings 2–4 are evaluated as less sustainable, rating 5 is estimated as neutral, ratings 6–7 are evaluated as potentially sustainable, and ratings 8–10 are assessed as highly sustainable (Sugiyono, 2020). Each indicator is assigned a weighting based on its contribution to the system being measured. The measurement results from 32 indicators, obtained through the rating process, are entered into a table and multiplied by their respective weights to produce a score. The total score for each system produces coordinates that are presented on the Barometer graph, while the rating values are presented in the AMOEBA visualization. Research indicators are formulated based on relevant theoretical foundations, as presented in Table 1.

**Table 1.** Sustainable Indicators (SI).

Society		
Traditional Villages in East Sumba: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Prailiu, Lambanapu		
System	Dimension	Indicators
The Human System	Politic	SI1 Women occupy strategic positions in organizational management (Vujko et al., 2024)
		SI2 Women have opportunities to express their opinions (McCall & Mearns, 2021)
		SI3 Women participate in tourism development planning (Rahmawati & Darwis, 2023)
		SI4 Women develop women’s institutions, such as the Family Welfare Movement (Wirdawati et al., 2024)
	Economic	SI5 Women are actively involved in various tourism business sectors (El-Manhaly & Taha, 2024)
		SI6 Women have opportunities to establish independent businesses in the tourism sector (Wardhani & Susilowati, 2021)
		SI7 Women generate income from tourism to strengthen the economy (Borović et al., 2022)
		SI8 Women experience increased economic independence (Rahmawati & Darwis, 2023)
	Social Dimension	SI9 Women gain self-confidence through tourism involvement (Vujko et al., 2024)
		SI10 Women have opportunities to socialize through tourism businesses (El-Manhaly & Taha, 2024)
		SI11 Women achieve gender equality through the tourism business (Ghimire et al., 2024)
		SI12 Women possess awareness for self-development and future generations (Pécot et al., 2024)
Production Structure	SI13 Women process environmentally friendly raw materials (El-Manhaly & Taha, 2024)	
	SI14 Women play active roles in environmental and cultural conservation (Butler et al., 2022)	
	SI15 Women are actively involved in local infrastructure management (El-Manhaly & Taha, 2024)	
	SI16 Women possess adequate skills and knowledge (Wirdawati et al., 2024)	
Environmental Impacts (Butler et al., 2022)	SI17 Fostering awareness to participate in environmental conservation actively	
	SI18 Long-term activities impact population density and congestion.	
	SI19 Tourism activities potentially generate waste from tourism-related activities.	
	SI20 Tourism management potentially triggers conflicts among local communities.	
The Ecosystem	Ecosystem Quality (Yin et al., 2022)	SI21 Community-Based Tourism (CBT) has adequate water resources
		SI22 CBT has adequate and representative land for the tourism business
		SI23 CBT maintains clean air quality that poses no risk to human health
		SI24 CBT implements tourism mitigation programs
	Tourism diversity (Afifa & Nugroho, 2022)	SI25 CBT possesses a unique traditional culture
		SI26 CBT produces distinctive handicrafts
		SI27 CBT offers distinctive cuisine
		SI28 CBT features natural beauty based on archipelagic characteristics
Environmental Policy and Management (Kapera, 2018)	SI29 CBT maintains healthy governance and executes its functions and responsibilities	
	SI30 CBT implements sustainable tourism development programs	
	SI31 CBT establishes policies that regulate development	
	SI32 CBT maintains extensive cooperation with various stakeholders	

Source: developed from Ko (2005).

### 3. Results

#### 3.1. General Overview of CBT in East Sumba

The research utilizes eight CBTs, including Mondu, Lambanapu, Malumbi, Prailiu, Watuhadang, Rindi, Kaliuda, and Lainjanji. Mondu Village is located in Kanatang District

and covers 90.45 km<sup>2</sup>. The tourism potential of Mondu Village includes savanna landscapes, Mangejing ritual culture, Padadita traditional village, Tanggedu waterfall, Kapihak Beach, and a creative economy through weaving, lontar leaf handicrafts, and statue carving. The population of Mondu Village is 1596, primarily engaged in farming, livestock breeding, and fishing. Lambanapu Village is situated in Kambera District, covering 795 hectares, with a population of 3191. The area is mainly rice fields and agricultural land, so most residents work in farming. Its tourism attractions include the Kambaniru River, the Lambanapu archeological site, the cultural house, weaving, the Tanau and Seribu hills, the Ori Angu Dance Studio, and the Li Luri Studio. Both Mondu and Lambanapu villages are vulnerable to flood disasters. Malumbi Village, located in East Wewewa District, spans 11.2 km<sup>2</sup> with 2467 residents, mostly farmers and artisans. Its tourism potential includes the Kambaniru River and Dam, herbal hills, weaving, betel nut processing sites, and bamboo crafts. Prailiu Village is in Kahaungu Eti District, covering 51 hectares and home to 7874 residents who work as farmers and artisans. Attractions include Prailiu Village, Hamayang (Traditional Ritual), Parunggara tour (Guest Welcome), Hambu marata (bride welcomed in the village of origin), Puru la kamaidu (harvest ceremony), Palupang Djara (Horse Racing), megalithic stones, mangrove tourism, Batu Payung Beach, traditional dance, ikat weaving crafts, and specialty foods like Manggulu, kaparak, instant ginger beverages, and moringa biscuits. Watuhadang Village, in Umalulu District, covers 1020 hectares and has 2954 residents engaged in farming, livestock breeding, and weaving. Its tourism potential includes traditional villages, megalithic graves, traditional houses, pahikung weaving, savanna hills, and the kendingan dance. Watuhadang is relatively safe from natural disasters. Rindi Village, in Rindi District, covers 57 km<sup>2</sup> and has 1702 residents, mainly farmers, livestock breeders, and fishermen. Its attractions consist of noble graves, the tarik bati tradition, the Praiyawang traditional village, and stone carving crafts. The town faces risks from floods and storms. Kaliuda Village, in Pahunga Lodu District, spans 110 hectares and is home to 4238 residents engaged in farming, fishing, livestock breeding, and artisan work. Its tourism appeals include ancestral culture on woven fabrics and Prianu customs, Marapu traditional funeral rituals, megalithic graves, weaving crafts, seaweed farming, the Nalu and Kanggoa Rivers, the Prianu traditional village, Tandening savanna grassland (the longest savanna), and traditional dance. Kaliuda is vulnerable to natural hazards, including floods, tsunamis, and earthquakes. Lainjanji Village, in Wulla Wajijilu District, covers 97.2 km<sup>2</sup> with 1500 residents, who mainly work as farmers, plantation workers, and fishermen. The area's attractions include coastal flows and savanna grasslands. The tourism potential consists of the Lainjanji River, Woranu River, Praibakal River, Watuparunu Beach, hot springs, ikat weaving, and seaweed farming.

The selection of these eight CBTs was based on regional characteristics and potential, specifically traditional cultural assets, weaving crafts, and natural resources from the archipelago. Villages known for weaving have significant potential to empower women because most weaving artisans are women. These eight CBTs pose challenges to women's empowerment in tourism management, potentially affecting their families' economic independence. Based on data collected through observation, interviews, and documentation, the assessments of 32 indicators are shown in Table 2.

Table 2 shows the results of sustainable tourism measurements using human systems and ecosystems, covering eight subsystems. The rating value presents measurement results for 32 weighted indicators. The score is calculated by multiplying the weighted value by the rating value. In Table 2, column 1 lists a rating of 6 for the sustainable indicator (SII). The score of 0.5 is the product of the weighted value and the rating value. The total indicator score for the human system is the X-coordinate value. The total score for the ecosystem indicator is the Y-coordinate value, representing the sustainable condition in the Barom-

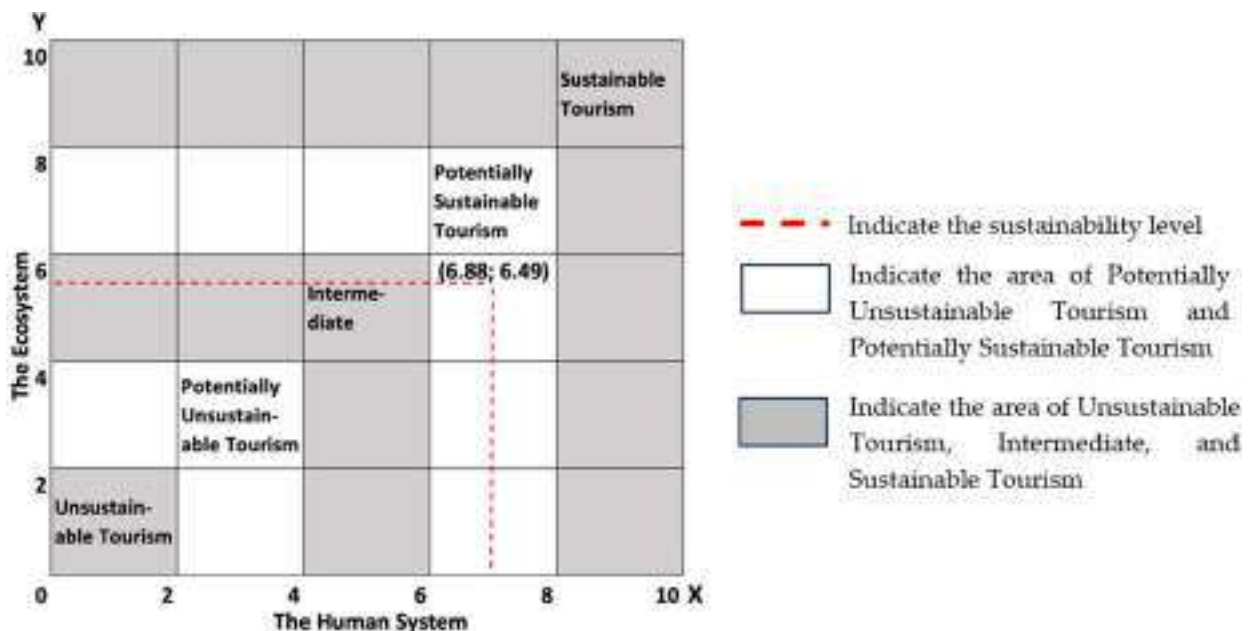
eter graph. The rating value also shows the sustainable condition for each indicator, as presented in the AMOEBA visualization.

**Table 2.** Sustainable Indicator (SI) Assessment.

System	Dimension	Indicator	Weight	Rating	Score	System	Dimension	Indicator	Weight	Rating	Score
(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
The Human System	Politic	SI1	0.08	6.00	0.50	The Ecosystem	Environmental Impacts	SI17	0.07	7.00	0.51
		SI2	0.06	8.00	0.44			SI18	0.02	4.00	0.10
		SI3	0.06	6.00	0.33			SI19	0.07	6.00	0.44
		SI4	0.03	9.00	0.25			SI20	0.05	6.00	0.29
	Economic	SI5	0.08	7.00	0.58		Ecosystem Quality	SI21	0.07	4.00	0.29
		SI6	0.03	7.00	0.19			SI22	0.07	6.00	0.44
		SI7	0.08	6.00	0.50			SI23	0.05	7.00	0.34
		SI8	0.08	6.00	0.50			SI24	0.07	4.00	0.29
	Social	SI9	0.06	7.00	0.39		Tourism diversity	SI25	0.07	9.00	0.66
		SI10	0.06	8.00	0.44			SI26	0.07	9.00	0.66
		SI11	0.08	8.00	0.67			SI27	0.07	6.00	0.44
		SI12	0.06	7.00	0.39			SI28	0.05	9.00	0.44
	Production Structure	SI13	0.08	8.00	0.67		Environmental Policy and Management	SI29	0.07	6.00	0.44
		SI14	0.06	8.00	0.44			SI30	0.05	6.00	0.29
		SI15	0.03	5.00	0.14			SI31	0.05	7.00	0.34
		SI16	0.07	6.00	0.44			SI32	0.07	7.00	0.51
$\bar{x} = 7$					$\Sigma = 6.88$	$\bar{x} = 6.44$					$\Sigma = 6.49$

3.2. Quadrant of Sustainability Levels

Based on scoring values in Table 2, the axis value (X; Y) is (6.88; 6.49), which is in the potentially sustainable quadrant, as shown in Figure 2. This quadrant highlights opportunities for sustainable CBT in East Sumba, emphasizing the balance between the Human System and Ecosystem with tourism pentahelix involvement.



**Figure 2.** Barometer of Tourism Sustainability (BTS).

3.3. Sustainability Indicators Value

Based on Table 2, the AMOEBA diagram in Figure 3 illustrates the level of tourism sustainability in East Sumba.

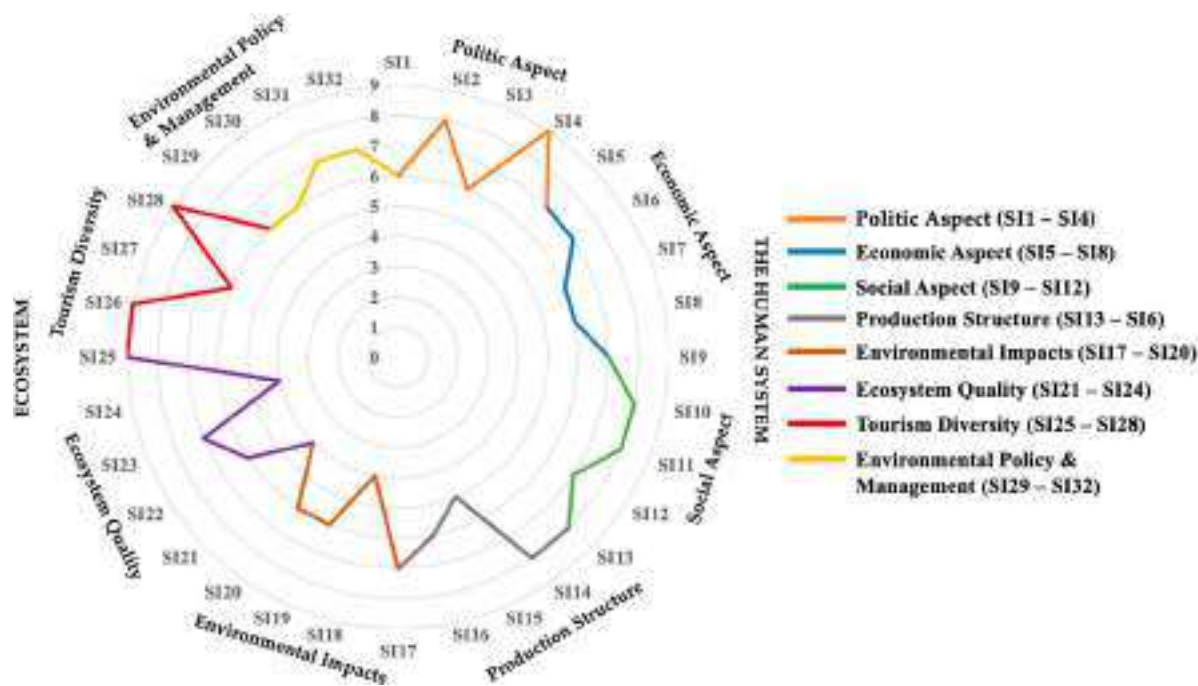


Figure 3. AMOEBA of Tourism Sustainability Indicator (ATSI).

The AMOEBA figure indicates potentially sustainable tourism development on East Sumba Island by its broad coverage. The extent of pseudopodia reflects the magnitude of indicator values: the wider the reach, the higher the value.

## 4. Discussion

### 4.1. Sustainability Level of the Human System in East Sumba Tourism

The human system in sustainable tourism comprises political, economic, social, and production dimensions. Table 2 shows that the average human system assessment is 7, indicating potentially sustainable conditions. However, the women’s empowerment indicator in local infrastructure management (SI15) shows relatively low scores of 5. Women’s involvement can be improved by making homestay management a central accommodation for CBT. Most CBTs have not provided homestays due to limited staff knowledge and skills, instead renting parts of residents’ rooms for tourists. Existing homestays operate independently from residents’ houses, resulting in little interaction between tourists and hosts (Wijayanti & Dewi, 2023). Women’s empowerment has reached relatively optimal levels in several tourist destinations, such as Bali, Banyuwangi, Bantan, and Yogyakarta, where women play key roles as business managers, tourism promoters, and preservationists (Sirad et al., 2025).

The political aspect is assessed through women’s participation in institutions directly and indirectly linked to the tourism industry. As seen in Table 2, the highest rating indicator is 9, indicating that women in East Sumba run an organizational forum through community-based groups focused on family empowerment, specifically the Family Welfare Movement (S14) (Wirdawati et al., 2024). However, women’s involvement in tourism-related organizations remains limited, especially in Tourism Awareness Groups and Tourism Village Management bodies. The hierarchy within tourism organizations remains male-dominated, limiting women’s roles in planning. Although women have opportunities to share their ideas and opinions verbally and in writing about tourism development (McCall & Mearns, 2021), the management process from planning to oversight is mainly carried out by men. Women’s active participation in East Sumba’s tourism growth

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primarily focuses on tourism business activities, particularly in culinary services, the creative economy, and cultural preservation.

The dimensional indicator measurements shown in Table 2 indicate that while women's empowerment in the tourism industry has reached a sustainable level, its positive impact on economic growth remains limited. This limited impact is partly due to the lack of coordinated and comprehensive support. As a result, women's empowerment efforts remain scattered and do not effectively drive long-term economic development or sustainability. For example, although weaving is a common form of women's empowerment in East Sumba's CBT, the lack of integration across the production and marketing phases limits weavers' ability to increase their income and contribute to broader economic resilience.

Tourism development in East Sumba aims to drive economic growth and improve families' financial independence by empowering women. Women's participation is expected to stimulate tourism growth across the region. As of 2024, 64,630 women in East Sumba are housewives without income—51.94% of the female population and 25.29% of the total population. Women's involvement primarily remains in small-scale operations, with limited roles in starting independent enterprises, which is the main barrier to strengthening the family economy (Borović et al., 2022).

Culinary attractions in East Sumba remain limited in both quantity and quality. The variety of cuisine offered lacks diversity and is presented simply with insufficient representation. Residents produce cuisine in relatively small amounts due to limited market access. Specialty dishes are not consistently available and are often only made upon request or during tourist visits. East Sumba's specialty dishes include Manggolu (made from kepok bananas and peanuts) and Kaparak (made from corn, rice, and sago). Other culinary options include Woba (seaweed) from Kaliuda Village, lobster from Lainjanji Village, and instant ginger beverages and moringa biscuits from Prailiu Village. Women's empowerment in culinary management can be improved through increased training in culinary skills, packaging, and marketing strategies.

Women's active participation in the creative economy and cultural preservation sectors is clear through handicrafts and traditional dances that attract tourists. East Sumba's notable handicrafts include ikat-woven textiles and pahikung, which vary from village to village. Women play key roles as artisans and keepers of weaving history and cultural traditions. East Sumba includes several weaving artisan communities, such as Karaja Sumba, Praiyawang, Pau, Prailiu, Kanatang, and Kaliuda. East Sumba features various unique traditional dances with significant historical importance, often performed during traditional ceremonies and to welcome distinguished guests. These dances, as part of tourism attractions, are curated to offer compelling experiences for visitors. Some of the preserved dances in East Sumba include Hogor Watang from Kaliuda village, Tebe and Dho'a dances from Lainjanji village, Ori Angum Dance Studio and Li Luri Dance Studio from Lambanapu village, and Kendingan Dance from Watuhadang village.

Integrated tourism package development can serve as a strategy to enhance family livelihoods by empowering women in East Sumba. Tourism packages are designed around various potentials in an integrated, thematic approach, encompassing cultural assets, natural resources, the creative economy, culinary offerings, and other potentials, all managed through women's empowerment. Integrated tourism packages offer substantial opportunities for women to participate actively in tourism enterprises, from planning to monitoring. Women have opportunities to develop thematic tourism packages related to weaving, integrated with other tourism potentials, thereby enabling woven fabric products to achieve higher economic value. Tourists demonstrate willingness to pay premium prices for tourism packages because they not only acquire woven fabrics as handicraft

2 products but also gain historical and cultural experiences with considerable educational value. Thematic tourism packages stimulate economic acceleration by engaging resources in both quantity and quality, including women. Women serving as weaving artisans fulfill dual roles: producing woven fabric, packaging, and presenting products to tourists.

Women in East Sumba recognize that their empowerment in the tourism industry generates substantial social impacts, such as increased gender equality, confidence, and skills. Survey assessment scores of 7 and 8 in Table 2 reflect these outcomes. Through empowerment, women gain wider access to operational and leadership roles within tourism management, leading to greater representation and influence in decision-making. Their active involvement also raises awareness and promotes the development of new knowledge, benefiting both individuals and the community. As women take on greater responsibility in tourism, they help foster a more inclusive and equitable industry, enabling broader participation and social progress.

2 The production structure dimension, which encompasses both services and high-quality products, is a key element supporting the sustainability of the tourism area. Service elements are closely connected to human resource capacity as the leading actors in tourism management (Wirdawati et al., 2024). Success in CBT management heavily depends on local human resource capacity since it operates by, from, and for the community. In Table 2, ratings for indicators related to women's involvement in local infrastructure management and to skills and knowledge in the tourism sector remain relatively low. This is supported by East Sumba Regency data from 2024, showing that community education is primarily at the primary school level, accounting for over 98%. Improving human resource capacity is a critical, urgent step toward sustainable tourism. The quality of tourism products depends on effective management systems supported by sufficient infrastructure (El-Manhaly & Taha, 2024). In East Sumba, local infrastructure in tourism areas is still limited in both availability and accessibility. Restroom facilities, which are essential amenities for tourists, are scarce and often in poor condition. Increased involvement from various stakeholders is needed to accelerate the development of tourism infrastructure and enhance human resource capacity. Stakeholder programs related to infrastructure development include CSR efforts from Sarana Multi Infrastruktur (SMI) in partnership with Universitas Bina Sarana Informatika (UBSI). SMI has helped build restrooms, food courts, UV curing equipment for weaving, and water wells in Watuhadang village. At the same time, UBSI has provided training and support to boost human resource capacity.

According to Table 2, women's empowerment receives high ratings in the processing of environmentally sustainable raw materials and in conservation efforts. Women actively participate in cultural conservation by maintaining weaving traditions and preserving traditional dances (Butler et al., 2022). The use of naturally sourced coloring materials for dyeing threads to be woven into fabrics, such as *Morinda citrifolia* roots, indigo leaves, tree bark, and clay, further demonstrates engagement with sustainable practices.

#### 4.2. Sustainability Ecosystem Level in Tourism Development in East Sumba Tourism

The second system in sustainable tourism comprises the ecosystem, consisting of four dimensions: Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Based on Table 2 data, the average rating value is 6.43, which overall falls within the potentially sustainable category. However, three indicators are considered less sustainable: long-term congestion potential (S118), adequate water availability (SI21), and tourism mitigation implementation (S124).

Tourism management in East Sumba generates both positive and negative consequences. Generally, tourism activities in East Sumba can foster local community awareness of the importance of environmental and cultural preservation as primary products of

the tourism industry. Meanwhile, negative impacts of tourism activities include potential congestion from increased tourist flows, challenges in waste management, and conflicts among local communities (Butler et al., 2022). Waste issues in East Sumba are already becoming apparent, despite tourist visitation flows not yet being substantial. Plastic waste problems are increasingly exacerbating environmental pollution on land and at sea, as adequate waste management systems remain absent. From an institutional perspective, tourism management potentially triggers conflicts within local communities. The primary factors driving internal conflicts include dysfunctional institutions, a lack of transparency, and unclear programming.

2 The Ecosystem Quality dimension encompasses water resources, land, clean air, and tourism mitigation (Yin et al., 2022). East Sumba is a tourist area with extensive land and clean air, thanks to low pollution levels. In certain areas, water availability remains a fundamental challenge due to hilly terrain and the risk of drought. Natural springs constitute one water source for meeting community needs. Drought is the primary disaster threat to the East Sumba region, while other threats include floods, earthquakes, and tornadoes. Disaster issues in any area significantly influence tourist interest, necessitating robust mitigation as security assurance for tourists. Tourism mitigation in the East Sumba region has not yet been implemented optimally.

1 The Tourism Diversity dimension constitutes the primary attraction for tourists, including cultural uniqueness, handicrafts, culinary offerings, and natural beauty. The East Sumba region offers diverse and unique cultural tourism attractions, including traditional dances and customary ceremonies, which are still preserved by local communities (Afifa & Nugroho, 2022). One customary ceremony that continues is the death ritual according to Marapu beliefs. This ceremony aims to escort the deceased's soul to the afterlife, where the body can be preserved for years because families must prepare substantial costs for the burial procession. East Sumba offers weaving crafts that access international markets. Woven textiles are created by predominantly female craftspeople and feature various motifs that each possess its own philosophical significance. The culinary offerings remain severely limited, though some areas offer various fish preparations made from fishery products from the archipelagic region. East Sumba is an archipelagic region with significant marine natural resources, including beaches and fisheries. Beach potential attracts tourists with several characteristics, including sea-oriented interests and family travel patterns. The attractions offered by beach potential include striking natural scenery, exotic wildlife, and culture (Hall & Page, 2009), as well as atmospheric freedom, peaceful environments, and local cuisine (Sharpley, 2012).

1 Sustainable tourism cannot be realized without the Environmental Policy and Management dimension, as an aspect ensuring system functionality. The Environmental Policy and Management dimension includes healthy institutions, development programs, policies, and cooperation with various parties (Kapera, 2018). The Environmental Policy and Management dimension is potentially sustainable with average values of 6 and 7. The institutions managing tourism in East Sumba remain suboptimal, as evidenced by weak administration, ineffective management, and a lack of work programs. Tourism awareness group organizations and CBT managers, as organizations with distinct functions and roles, are often perceived as identical. This incorrect perspective regarding these organizations potentially triggers conflicts in tourism management. Tourism management remains incidental, lacking short-term, medium-term, and long-term planning, which can lead to unsustainable tourism. The government plays an important role in realizing sustainable tourism through policies that serve as references and protection in tourism management. The East Sumba district government, in general, and the Tourism Office, specifically, must issue policies for tourism management and conduct regular training and assistance programs.

The government represents one of the pentahelix elements that collaborate to support tourism management in East Sumba. Other pentahelix elements include academia, business, community, and media. The role of each pentahelix element in East Sumba tourism development includes: government as the policymaker and facilitator; academia supporting human resource capacity building; business supporting infrastructure development acceleration and capital provision; community supporting management systems; and media supporting publication as components of promotion and marketing. The government's role as policymaker is crucial to ensuring legal protection in island-based CBT management, which is vulnerable to degradation, and to optimizing women's empowerment.

#### *4.3. The Harmonization Between the Human System and the Ecosystem of Sustainable Tourism Development in East Sumba*

The Barometer Figure shows the potentially sustainable quadrant, indicating that CBT in East Sumba offers opportunities for sustainable tourism development through efforts to balance the Human System and Ecosystem, facilitated by tourism pentahelix involvement. Collaboration with various parties can accelerate the optimization of sustainable indicators with low ratings. The potentially sustainable condition can decline to the intermediate quadrant or even to unsustainable status if strategic improvement efforts involving various stakeholders are absent. Women as resources become a strategic alternative for realizing sustainable tourism through optimal empowerment. Several aspects that remain unbalanced in sustainable tourism optimization are as follows: (1) Despite gender equality efforts, women in East Sumba have not yet received opportunities to hold management positions, have not received operational roles, and cannot manage businesses independently; (2). Despite efforts to realize ideal institutions, tourism institutions, such as tourism awareness groups and tourism village managers, have not yet implemented administrative procedures, lack transparency, and have no work programs; (3) Despite efforts to build quality ecosystems, mitigation systems are not yet sufficiently robust and water availability is inadequate; (4) Despite waste management efforts, plastic elements are still utilized in food and beverage packaging; (5). Despite efforts to increase tourist attractions, culinary processing using local raw materials remains minimal.

Based on the AMOEBA diagram, small pseudopodia are reaching with a rating value of 4, signifying a less sustainable status, namely indicators for long-term activities impacting density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Limited human resources and capital in tourism management are among the obstacles to securing adequate water supplies and mitigation systems. Therefore, it is crucial for all stakeholders to actively collaborate and take decisive steps to accelerate sustainable tourism management.

Pseudopodia with extensive reach maintain a rating value of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), possess unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and exhibit archipelago-based natural beauty potential (SI28). Women in Sumba have ample opportunity to play an active role in women's organizations; namely, as administrators in organizations for family empowerment and welfare. Sumba women play an important role as preservers of Sumba's cultural heritage, as weavers of traditional fabrics. For the most part, women use weaving to generate income and improve their families' economic situation. The AMOEBA diagram is a tool for assessing the sustainability of community indicators by measuring their relative strengths and weaknesses. Based on this diagram, small pseudopodia reached a ranking value of 4, indicating a less sustainable status, namely indicators of long-term activities that affect density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Pseudopodia with a wide reach maintain a rating of 9, indicating that women are developing institutions such as the Family Welfare

Movement (SI4), have unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and demonstrate the potential for archipelago-based natural beauty (SI28).

#### 4.4. Sustainable Tourism in East Sumba Archipelago Through Women's Empowerment

1 Women's empowerment in realizing tourism in East Sumba is achieved through active participation in CBT management, from planning to monitoring. Women's involvement in CBT management in East Sumba remains limited and has not had a significant impact on families' or society's economic development. Optimization of women's empowerment is expected to reduce the still-elevated stunting rates on East Sumba Island. CBT represents a tourism development pattern that emphasizes local community empowerment to improve their economies through tourism business management (Steinicke & Neuburger, 2012). Empowering East Sumba communities, especially women, is fundamental to evaluating the achievements of tourism development. The most crucial empowerment component is empowered human resources, effectively managed to achieve development objectives (Abdullah et al., 2022). Women's empowerment becomes a strategic issue in East Sumba because it supports long-term, significant relationships with poverty alleviation and the reduction in stunting rates. This assertion aligns with Adnyani and Purnamawati's (2024) research, which states that women's roles in indigenous communities in managing Balinese cultural tourism impact family economic resilience. Women in Bali fulfill dual roles by actively participating in various tourism businesses without abandoning family responsibilities.

Women's empowerment in the East Nusa Tenggara region faces various obstacles, including limited capital, unequal employment opportunities, and social gender stereotypes. However, there are significant opportunities for women to increase their participation in the tourism industry, potentially improving their welfare. Implementing inclusive tourism in the East Nusa Tenggara region can generate economic benefits for local communities.

#### 4.5. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago

East Sumba, as an archipelagic region, possesses tourism potential that could serve as an economic driver. Island potential packaged as tourism packages in CBT management can improve family economic independence. Sustainable tourism plays a role in poverty alleviation by emphasizing several factors, including environmental factors (Neto, 2003), social factors, and political factors (Hall & Page, 2009). PPT can serve as an effective poverty alleviation tool and supports tentative steps to realize its potential. PPT implementation using sustainable development approaches, through stakeholder involvement in corporate social responsibility, significantly impacts poverty alleviation (Diego et al., 2016).

2 Low PPT implementation in the business sector hinders tourism from fulfilling its role effectively, leading to stagnation and failure. Business sector involvement through CSR programs provides internal and external company benefits that impact economic, socio-cultural, and environmental aspects. Internal benefits include building reputation and business sustainability through improved company image and customer loyalty. External benefits include sustainable development as corporate social responsibility toward broader society (Diego et al., 2016). CSR's role in tourism development on East Sumba Island remains relatively modest. One CSR entity involved in tourism management on East Sumba Island, SMI, is an Indonesian State-Owned Enterprise operating in infrastructure financing. SMI's CSR program supports sustainable tourism development in Watuhadang Village by enhancing the quality of creative economy products in the weaving and culinary sectors, improving restroom facilities, and increasing water availability through borehole construction. PT SMI constructed UV-curing equipment for weaving craftspeople to accelerate drying during the production of woven fabrics. UV Curing availability significantly

helps craftspeople improve product quality and quantity. Food court construction enables the optimization of women's empowerment in the culinary sector, from raw material processing and planning to product marketing. Meanwhile, borehole construction promotes ecosystem quality by ensuring adequate water availability to support tourism activities. Access to clean water is a key issue in the East Sumba region, which is highly vulnerable to drought disasters.

CSR programs that can contribute positively to poverty alleviation possess several characteristics: suitability for impoverished rural areas; labor-intensive approaches; empowerment of women and communities representing economically disadvantaged populations; and encouragement of tourism activities that create business opportunities (Spenceley & Meyer, 2012). CSR describes a multifaceted concept encompassing four categories of community expectations (Carroll, 2017): (1) economic expectations (i.e., companies should be profitable), (2) legal expectations (i.e., companies should operate within legal boundaries), (3) ethical expectations (i.e., business operations should meet specific ethical standards not required by law), and (4) philanthropic or discretionary expectations (i.e., companies should voluntarily contribute to addressing social needs, including poverty alleviation). CSR activities are voluntary, so companies bear consequences for their ethical or philanthropic responsibilities (Inoue & Lee, 2011). CSR maintains a substantial role in poverty alleviation through 'pro-poor CSR' programs. Pro-poor CSR encompasses several key initiatives, including poverty reduction, fostering relationships with local suppliers and informal sectors, promoting sustainable tourism practices, and preserving the natural environment of economically disadvantaged communities. Companies can collaborate with secondary stakeholders such as NGOs, government institutions, and international organizations (Smith & Ong, 2015).

## 5. Conclusions

Women represent a significant potential resource in East Sumba, given their considerable numbers and their status as unpaid family workers. Women's empowerment in East Sumba becomes a strategic issue due to cultural traditions and persistently strong patriarchal perspectives (Swari, 2023). Women play crucial roles in achieving family economic independence and reducing stunting rates through their involvement in tourism businesses. Tourism empowerment is measured through sustainable tourism approaches that encompass two inseparable systems: the human system and the ecosystem. The human system encompasses four key dimensions: political, economic, social, and production structure.

In contrast, the ecosystem comprises Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Each dimension contains four indicators, resulting in 32 indicators for measuring tourism sustainability levels in East Sumba. Based on scoring results for 32 indicators, tourism in East Sumba falls within the potentially sustainable category, with opportunities for sustainability through adjustments and strengthening several indicators. This research provides strategic recommendations to advance sustainable tourism, focusing on inclusive tourism through women's empowerment, the creation of thematic, integrated archipelago-based tourism packages, the establishment of healthy CBT institutions, and the strengthening of Pentahelix cooperation.

The theoretical implication of this research is to enrich references on women's empowerment in island tourism areas. The references offer concepts of inclusive and pro-poor tourism management. Island tourism areas have unique and vulnerable characteristics, so this study is expected to provide strategic references. In practical terms, this study provides an overview of the sustainability of tourism developed in the Sumba Island tourism area through women's empowerment. The existing conditions serve as a reference for

relevant stakeholders to formulate plans for Sumba women's participation in supporting sustainable tourism management.

This study offers several recommendations for women's empowerment in CBT across the archipelago. The implication of this research is to provide a broader understanding for various stakeholders, especially women, thereby increasing their involvement in the tourism industry. The active participation of women in the tourism business specifically increases family economic independence and, more generally, influences the financial movement of local communities in East Sumba Regency. Family economic independence in the short- and medium-term can significantly reduce stunting rates.

This research has limitations in geographic coverage, making it difficult for researchers to reach all tourist villages in East Sumba Regency. East Sumba Regency has 14 tourist villages that are relatively far apart, and internet access is limited, which poses an obstacle to data collection. Researchers need time and effort to obtain representative data. The research involved only two systems—namely, the Human System and the Ecosystem, each comprising eight dimensions and 32 indicators. Future research is expected to reach 14 tourist villages in East Sumba Regency. The research dimension can be enriched by including other under-researched areas, such as sociopreneurship and investment in CBT development.

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## Abbreviations

The following abbreviations are used in this manuscript:

CBT	Community-Based Tourism
PPT	Pro-Poor Tourism
CSR	Corporate Social Responsibility
BTS	Barometer of Tourism Sustainability
ATSI	AMOEBAs of Tourism Sustainability Indicators
SI	Sustainability Indicator
SMI	Sarana Multi Infrastruktur
UBSI	Universitas Bina Sarana Informatika

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# BUKTI KORESPONDENSI

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The screenshot displays a Gmail interface on a mobile device. The search bar at the top contains the text "economies article submission received". The left sidebar shows navigation options: Mail (99+), Chat, and Meet. The main content area lists folders: Kotak Masuk (8,997), Berbintang, Ditunda, Penting, Terkirim, Draf (59), Kategori, Sosial (764), Info Terbaru (2,640), Forum (101), Promosi (3,492), and Selengkapnya. Below these are labels: [Imap]/Drafts, Prioritas, Tindak-lanjuti, and Selengkapnya. The email being viewed is from "Editorial Office" (economies@mdpi.com) dated "Kam, 9 Okt 2025, 10.05". The subject is "[Economies] Manuscript ID: economies-3946451 - Submission Received". The body of the email reads: "Dear Dr. Wijayanti, Professor Lagarensen, Thank you very much for uploading the following manuscript to the MDPI submission system. One of our editors will be in touch with you soon. Journal name: Economies Manuscript ID: economies-3946451 Type of manuscript: Article Title: A Sustainable Development Approach to Women's Empowerment in Increasing Household Economic: Pro-poor Tourism Concept in the Archipelago Area Authors: Ani Wijayanti \*, Bet El Silisna Lagarensen \*, Atun Yulianto Received: 9 Oct 2025 E-mails: ani.awi@bsi.a.id, betel.lagarensen3@gmail.com, atun.aty@bsi.ac.id We encourage you to provide an Author Biography on this publication's webpage. Please click the following link to find the corresponding instructions and decide whether to accept our invitation: https://susy.mdpi.com/user/manuscript/author\_biography/88a898e3438dead1974eda9f051535c6 You can follow progress of your manuscript at the following link (login required): https://susy.mdpi.com/user/manuscripts/review\_info/88a898e3438dead1974eda9f051535c6".

# A Sustainable Development Approach to Women's Empowerment in Increasing Household Economic: Pro-poor Tourism Concept in the Archipelago Area

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## Abstract

Community-Based Tourism (CBT) in East Sumba highlights its unique natural features through its archipelagic potential, which is synergistically integrated with rich traditional cultural experiences. Island-based CBT faces strategic management challenges, especially in empowering human resources, notably women, amid the inherently vulnerable and fragile nature of island tourism assets. Women's empowerment, a key element of pro-poor tourism, significantly influences poverty reduction and helps address the high rates of stunting in East Sumba. This research aims to examine women's empowerment within archipelago-based CBT management frameworks that impact household economic independence. The study adopts a sustainable tourism approach that involves two systems: the human system and the ecosystem, broken down into four dimensions and 32 indicators to assess the sustainability potential. Data analysis uses scoring methods to produce BTS and ATSI diagrams. Findings show that East Sumba CBT falls within the potentially sustainable quadrant on the BTS diagram, with coordinate points (6 88; 6 49). The average scores are 7.0 for the human system and 6,44 for the ecosystem, supported by the AMOEBA diagram showing broad tendencies. The most critical and vulnerable sustainability indicators include ecosystem integrity, particularly access to clean water, and effective mitigation strategies. Conversely, the indicators with the highest robustness include active women's participation in Family Empowerment and Welfare Organizations and tourism diversification, which is enhanced by East Sumba's strategic location within Indonesia's eastern tourism corridor. Stakeholders can leverage these findings by promoting women's empowerment through integrated tourism package innovations, which can create more entrepreneurial opportunities and improve household economic conditions. This research contributes to understanding women's empowerment through sustainable tourism methods, emphasizing its role as a foundation for pro-poor tourism within island-based CBT frameworks.

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**Keywords:** Women's Empowerment; CBT; Pro-Poor Tourism; Archipelago Tourism; Household Economic; Human System; Ecosystem

## 1. Introduction

Sumba is one of the regencies located on the island of Sumba in East Nusa Tenggara Province, Indonesia. It is the third-largest land area after Timor Island and Flores Island, covering 11,153 km<sup>2</sup>. Sumba Island includes four regencies: East Sumba, Central Sumba, West Sumba, and Southwest Sumba. In 2020, East Sumba Regency was categorized as an underdeveloped area, as per Presidential Regulation Number 63 of 2020. Following development efforts, East Sumba Regency successfully moved beyond this classification, as per the Ministerial Decree of Villages, Development of Disadvantaged Regions, and Transmigration Number 490 of 2024. According to Government Regulation No. 63 of 2020, indicators of underdeveloped regions include community economic conditions, human resource capacity, infrastructure and facilities, regional fiscal capability accessibility, and territorial features. The community economic indicator is assessed through the percentage of the population involved in non-agricultural sectors, including tourism. Entrepreneurial opportunities in tourism are one factor used to improve the overall index for evaluating underdeveloped regions. East Sumba Regency's progress from underdeveloped to developing status in 2024 is reflected in the reduction of poverty rates from 2016 to 2023. The poverty rate decreased by 3.35%, from 31.43% in 2016 to 28.08% in 2023 (Central Statistics Agency of East Sumba, 2025).

Tourism is a service industry that can achieve a positive trade balance, making it recognized as an industry that can alleviate poverty through the involvement of local communities (Muhanna, 2007). The tourism industry is promoted as a key component of government policy agendas because it can create jobs and increase the income of local communities (Shakeela et al., 2011). CBT pro-poor is one of the active efforts to eliminate poverty through the rural tourism industry (Yang et al., 2021). Pro-Poor Tourism (PPT) was introduced in 1999 by the UK Department for International Development. PPT is a tourism development approach that benefits the poor and helps alleviate poverty. PPT aims to create entrepreneurial opportunities for the poor in tourism through four principles: (1) expanding business opportunities for the poor, (2) providing education and training, (3) increasing participation of the impoverished in tourism planning, and (4) sharing benefits locally (Butler et al., 2012). Poverty reduction efforts via tourism face challenges due to weak macro environments and limited community involvement (Rodriguez et al., 2017). Ecological and social poverty differ among cities because of environmental differences, highlighting the need for stronger feedback mechanisms. Implementing policies that regulate human-environment relationships is essential to enhance ecosystem stability and social equity, promoting sustainable development (Yang et al., 2021).

PPT implementation without private sector involvement leads to ineffectiveness, stagnation, and failure in the tourism business (Harrison, 2008). Corporate involvement through Corporate Social Responsibility (CSR) programs offers internal and external benefits to companies, covering economic, socio-cultural, and environmental aspects. Internal benefits include reputation building and business sustainability through an improved corporate image and increased customer loyalty. External benefits involve sustainable development as a result of corporate social responsibility, benefiting the broader community (Diego, 2016).

CSR is a complex concept that encompasses four societal expectations (Carroll, 2017): (1) economic expectations, meaning companies must be profitable; (2) legal expectations, meaning companies must operate within legal boundaries; (3) ethical expectations, meaning business operations should meet specific ethical standards not required by law; and (4) philanthropic or discretionary expectations, meaning companies should voluntarily help address social issues, such as poverty alleviation.

CSR promotes sustainable tourism through the 'triple bottom line' approach, integrating economic, socio-cultural, and environmental factors into business strategy and

operations (Coles et al., 2013). Companies can maximize profits while acknowledging their economic, socio-cultural, and environmental impacts. The CSR concept can achieve poor outcomes when companies address impoverished people's economic conditions (e.g., income, employment) as well as socio-cultural and environmental factors (e.g., access to education, health services, clean water, land for traditional use).

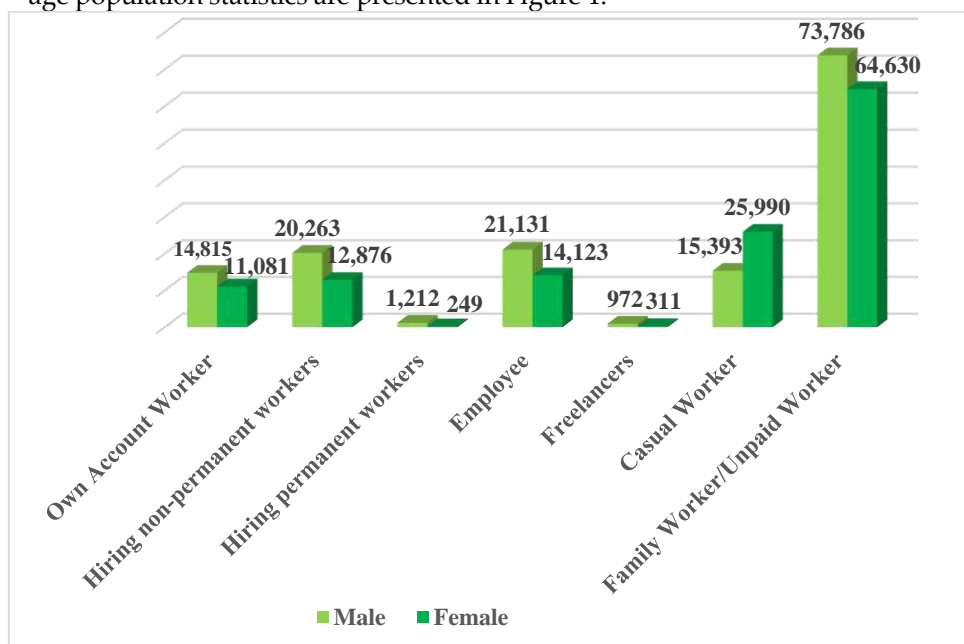
As an archipelagic territory, East Sumba Regency has diverse and unique tourism potential that serves as a vital part of the national economy. Island tourism holds competitive advantages, making it one of the popular travel destinations. It is a key source of revenue for developing countries (Kurniawan et al., 2017). Sustainable island tourism is promoted through cultural enhancement as a way to attract visitors (Ge, 2020). East Sumba Island, with its strong cultural heritage, offers a significant opportunity for development as a tourism hub. Management of the island focuses on personalized, nature-based experiences to promote sustainable tourism that benefits the local community economy (Figueroa & Rotarou, 2021). Effective sustainability practices through the responsible management of island resources can help address future uncertainties and climate change impacts. Archipelagic destinations have unique chances to develop a strong identity and become resilient when facing future crises (Figueroa & Rotarou, 2021).

East Sumba Island demonstrates significant tourism attraction, as shown by the steady increase in both domestic and international tourist arrivals each year. Based on visitor data from 2021 to 2023, tourist arrivals grew by 40%, with international visits increasing by 80%. However, in 2024, domestic tourist arrivals declined by 5,045 people (Central Statistics Agency of East Sumba, 2025). This data underscores the need for relevant stakeholders to develop strategic tourism management plans that maximize resource use and promote women's empowerment initiatives.

Island attractions are a vital part of marine tourism, which has grown into an international-scale industry. Archipelagic regions form the basis for sustainable tourism on islands. In developing countries, island tourism becomes a key source of income (Kurniawan et al., 2017) and provides entrepreneurial opportunities for local communities, while also contributing to economic growth (Kurniawan et al., 2019). Today, many islands are being developed into popular tourist spots (Povilanskas et al., 2016). Tourists are the main participants in island tourism, making the responsible use of island resources and the management of tourism environments essential for protecting and maintaining islands (Peng et al., 2012). Typically, island tourism environments include the natural surroundings, the cultural and human environment, and the economic setting. Developing island tourism involves managing challenges related to resources, environment, and tourism activities (Mai & Smith, 2018). Islands have unique features, delicate ecosystems (Douglas, 2006), limited land resources (Pearce & Chen, 2012), declining biodiversity and environmental conditions (Theppitak, 2018), and remain vulnerable to environmental harm caused by tourism development (Cullen-Unsworth et al., 2014). The marine sector is a crucial pillar of the national economy. Efforts to promote sustainable island tourism often focus on cultural enhancement to attract visitors (Ge, 2020). Developing sustainable ecotourism service systems is essential for islands that are more vulnerable and easily affected (Hsiao et al., 2021). The key component of marine ecotourism service systems is management capacity for mitigation, with ecological diversity serving as a core resource. Local communities work with stakeholders to build ecotourism systems that support conservation sustainability and increase tourist satisfaction (Hsiao et al., 2021). The government, as a stakeholder, plays a role in policy enforcement to protect marine resources, plan service systems, develop infrastructure, and improve accessibility in ecotourism sites.

Based on East Sumba statistics for 2024, women's empowerment remains comparatively limited. The majority of women in East Sumba are homemakers without income generation (family workers or unpaid laborers), totalling 64,630, attributed to

restricted opportunities for active participation in industrial sectors (Central Statistics Agency of East Sumba, 2025). This data demonstrates that most women remain unproductive and unable to contribute to the family's economic reinforcement. Productive age population statistics are presented in Figure 1.



**Figure 1.** Population 15 Years and Over who Worked During the Previous Week by Main Employment Status and Sex in East Sumba Regency, 2023.

Source: East Sumba regency in Figures 2024

Women's empowerment in East Sumba remains relatively limited due to two main factors: patriarchal norms and educational levels. In some aspects of social life in East Sumba, men still serve as the primary decision-makers in families and communities across various areas of life. Meanwhile, women are seen as holding subordinate roles and are more vulnerable to different forms of violence. Educational attainment in East Sumba is mainly at the primary school level. In 2022 and 2023, it was reported that over 98% of individuals had completed primary education (Central Statistics Agency of East Sumba, 2025).

Women's empowerment in East Sumba aims to improve family welfare, which helps lower the persistently high stunting rates, averaging 15% from 2021 to 2024 (Central Statistics Agency of East Nusa Tenggara Province, 2025). This rate exceeds the government target of below 14%. Women's empowerment through pro-poor tourism management, based on archipelagic traits, becomes a strategic option for boosting family economics and societal conditions overall.

The concept of community empowerment in CBT management in East Sumba has not been fully realized, especially regarding women's involvement. Women's participation in CBT management remains relatively limited, only extending to operational tasks in areas like culinary arts and handicraft production. Patriarchal views are a key factor limiting women's roles in CBT management in East Sumba. Society holds misconceptions about gender roles, which hampers women's ability to express themselves freely (Swari, 2023). The lack of women's empowerment directly affects family financial independence and efforts to reduce poverty in the broader community.

Sustainable tourism promotes equitable tourism through women's empowerment across various domains (Jamal & Higham, 2021). Women's empowerment efforts are supported by eco-feminist paradigms for eco-cultural justice (Camargo et al., 2016) and feminist epistemological views (Eger et al., 2022). Women's empowerment is key to achieving successful tourism development. It also plays a strategic role in long-term poverty reduction—for instance, women in indigenous communities managing Balinese cultural

tourism bolster family economic resilience. Balinese women take on dual roles through active participation in various tourism enterprises in Bali while still fulfilling family responsibilities (Adnyani & Purnamawati, 2024).

Perspectives on gender inequality become global concerns as barriers to women's empowerment initiatives in tourism development. Initially, the foundation of gender inequality was based on physical differences; however, it evolved due to social, historical, and cultural factors (Jule, 2014), including Arab women's patriarchal restrictions (Zuhur, 2003) and Confucian traditions in China (Hao et al., 2021). Gender inequality concerns become barriers to comprehensive, sustainable human development efforts, necessitating strategies to understand gender within specific socio-cultural contexts. The implementation of gender equality is very important for business development to improve the quality of excellent service and have an impact on customer satisfaction (Wan & Chan, 2018).

The concept of empowerment refers to a process that enhances the capacity of individuals and groups to achieve desired outcomes (Alsop et al., 2005). Empowerment initiatives lead to changes in the capabilities of individuals or groups (Ganle et al., 2015). Women's empowerment is a dynamic process that requires transformation from women and focuses on developing abilities or capacities (Cornwall & Rivas, 2015), enabling women to have the ability to control resources (Ali, 2014). Efforts to explore women's empowerment are carried out by providing equitable access to men, in accordance with applicable laws (Mosedale, 2005).

Most of the tourism industry is a women's economic activity, but men more often hold the top leadership. In this case, the issue of gender equality greatly affects the career process of women in the tourism industry (Carvalho, 2018). Women face considerable challenges in careers in the tourism industry, along with issues of tourism management and gender equality. In the tourism industry, women tend to get lower positions and salaries than men, despite having a higher level of education (Carvalho, 2014).

The process and mechanism of women's empowerment include three main components: resources, agency, and achievement (Kabeer, 2005). The agency component relates to applicable procedures, the resource component consists of factors that enable the agency to be exercised, and the achievement component reflects the outcomes of that agency. Empowerment programs are complex social processes that vary based on political, cultural, and socio-economic factors within a region (Richardson, 2018). The implementation and perception of women's empowerment may differ depending on their social environments (Mason & Smith, 2003). Therefore, measuring women's empowerment must be done within its socio-cultural context by clarifying the action constraints relevant to that context (Mosedale, 2005).

The COVID-19 pandemic led to an increased role for women in the tourism industry, impacting their economic lives and productivity. Women's empowerment offers opportunities to tackle global climate and pandemic crises by lowering vulnerability and boosting resilience and sustainability (Kalisch & Cole, 2023). Generally, women experience insecure employment, lower earnings, and limited career advancement (Nanthini & Nair, 2020).

The scope of tourism destinations includes two systems: the human system and the ecosystem, which serve as indicators for evaluating sustainable tourism (Ko, 2005). Humans, as essential parts of the ecosystem, are responsible for its long-term conservation. Sustainability assessment uses different dimensions as sub-systems and indicators as measurable aspects to evaluate tourism sustainability. The human system covers political, economic, socio-cultural, and production structure aspects, including service and product quality standards. In contrast, the ecosystem includes environmental impact, ecosystem health, biodiversity, and environmental policies and management frameworks.

The presence of women as members of the human-influenced system plays a crucial role in making sustainable tourism a reality. Women's empowerment in sustainable tourism efforts includes four key areas: political, economic, socio-cultural, and production structure. The tourism industry offers opportunities for women to take on roles within organizational hierarchies (Vujko et al., 2024), contribute innovative ideas or frameworks (McCall et al., 2021), and participate in tourism development planning (Rahmawati & Darwis, 2023). Women's active involvement in tourism-related organizations mainly remains limited to women's groups, such as Family Empowerment and Welfare (Wirdawati et al., 2024).

The achievement of sustainable tourism is shown through economic impacts, especially the creation of entrepreneurial opportunities and the growth of local community economies. Women's empowerment is realized through active involvement in various tourism businesses (McCall et al., 2021), opening doors to start independent businesses (Wardhani & Susilowati, 2021), which in turn leads to increased income (Idris et al., 2023; Vukovic et al., 2023), supporting household economic independence (Borovic et al., 2022).

From a social perspective, sustainable tourism creates opportunities for women to participate socially through various tourism industries (Rahmawati & Darwis, 2023). Active involvement in tourism boosts women's self-confidence (Hao et al., 2021), promotes gender equality (Ghimire et al., 2024), raises awareness of the importance of self-development and future generations (Pécot et al., 2024), and fosters increased pride (Rasoolimanesh et al., 2017; Su et al., 2016).

Sustainable tourism promotes optimal tourist satisfaction through strengthening service and product quality standards. Tourist experiences are formulated from various complex interactions (Kim & Brown, 2012), which can encourage tourists to revisit tourism destinations. Sustainable tourism is capable of packaging products from environmentally sustainable raw materials, promoting environmental and cultural conservation through infrastructure development (El-Manhaly & Taha, 2024), alongside adequate skills and knowledge from local communities (Pécot et al., 2024).

Cultural Heritage Tourism (CHT), as one sustainable tourism model, plays an essential role in preserving cultural heritage through community support from the planning stage and effective management (Su et al., 2016). Limited community involvement in the planning and management phases potentially creates social problems and conflicts among stakeholders (Zhu et al., 2017).

Tourism management produces both positive and negative effects (Butler et al., 2022). The positive aspects of tourism businesses include raising awareness of the importance of protecting the environment and culture. On the other hand, long-term adverse effects can include conflicts among local communities (Simpson, 2008), increased waste, and traffic congestion (Wang et al., 2010; McDowall & Choi, 2010; Pearce & Chen, 2012). Sustainable tourism should be able to create healthy ecosystems, such as sufficient water resources, suitable land for tourism activities, clean air (Yin et al., 2022), and the adoption of tourism mitigation strategies (Afifa & Nugroho, 2022).

Sustainable tourism is closely linked to tourism diversification (O'Halloran, 2020), which includes traditional cultural uniqueness, handcrafted crafts and culinary arts, and natural attractions found on islands (Mrd-a & Hrvoje Caric, 2019). Sustainable tourism involves establishing strong institutions that operate efficiently, uphold development programs and policies regulating tourism growth, and foster effective collaboration with various stakeholders (Kapera, 2018).

The Global Sustainable Tourism Development Council (GSTC) states that sustainable tourism applies four pillars: environmental, economic, social, cultural, and management. Implementation of these four pillars provides benefits to local communities and improves destination quality (Borland & Lindgreen, 2013). The conceptualization of sustainable tourism through four pillars is actualized through stakeholder synchronization and training

programs (Hizmi & Junaid, 2023), as the key to successful sustainable development (Junaid et al., 2021). Tourism environment, as the foundation of sustainable tourism development, encompasses natural ecological environment, economic environment, and social and cultural environment (Ge, 2020). Sustainable tourism development influences environmental conservation, economic development, and social progress (Hernández-Cuevas, 2024). The sustainable tourism model integrates environmental and social aspects to actualize competitive nature reserve tourism destinations (Murillo & Orozco, 2006).

In 2002, UNWTO launched the sustainable tourism and poverty elimination program by supporting sustainable development projects (Ashley & Roe, 2002). CBT, as a model of sustainable tourism, plays a crucial role for both impoverished and non-impoverished households and helps reduce poverty through community empowerment in tourism enterprises (Thomas, 2025). CBT represents a tourism development approach that highlights community empowerment as a way for local communities to boost their economy through managing tourism businesses (Steinicke & Neuburger, 2012).

East Sumba Island features 14 CBT sites with unique characteristics that showcase eastern Indonesian cultural experiences. CBT in East Sumba is notable for its location at Indonesia's eastern edge, offering stunning coastal scenery and captivating savanna landscapes. Island tourism plays a vital role in marine economic development (Mo & Qi, 2023). Currently, island tourism faces significant challenges, requiring strategic efforts to boost competitiveness by empowering local communities (Cameron, 2010). East Sumba offers stunning natural beauty and opportunities to connect with indigenous culture. Marapu is the most prominent cultural site on East Sumba Island, symbolizing local beliefs that foster close ties among humans, the universe, and ancestral heritage. The area's natural environment remains remarkably pristine, as Sumba Island is a specialty interest tourism destination

This research examines women's empowerment in island-based CBT located in East Sumba Regency, East Nusa Tenggara. Archipelago tourism has different characteristics from urban or rural tourism and is more vulnerable to environmental degradation. The findings offer an overview of current conditions related to women's empowerment through CBT management, which influences family economic improvement. The study offers strategic recommendations for reducing poverty through women's empowerment in tourism businesses, supporting household economic growth and independence. The implications include reconceptualizing women's empowerment based on the study's findings. The research adds new insights by focusing on women's empowerment in island-based tourism areas to help reduce poverty and promote sustainable tourism goals.

Previous research has examined women's empowerment in CBT (McCall et al., 2021; Idris et al., 2021; El-Manhaly & Taha, 2024), pro-poor tourism (Yang et al., 2021; Rodriguez et al., 2017; Butler et al., 2012), and archipelago-based tourism (Lewis-Cameron & Williams, 2022; Figueroa & Rotarou, 2021; Hsiao et al., 2021) in fragmented approaches. This research integrates three tourism management variables assessed using a sustainable tourism methodology—first, women's empowerment as SDG 5: Gender Equality. Second, archipelagic regions are key components of marine tourism, serving as primary attractions in Indonesia, as an archipelagic nation. Island tourism offers unique potential but also involves fragile and easily compromised characteristics, which require effective and efficient management strategies—third, pro-poor tourism as SDG 1: No Poverty. Strategies for poverty alleviation are a strategic concern in eastern Indonesian regions, including East Nusa Tenggara.

## 2. Methodology

The research design adopts a descriptive quantitative methodology with a focus on sustainable tourism. The quantitative approach is used to measure indicators of

sustainable tourism assessment, covering two systems: the Human System and the Ecosystem. Primary data is collected through observation and interviews to determine scores, while secondary data is obtained from third-party sources, both online and offline. Primary data was collected through Focus Group Discussion (FGD) using survey and interview methods from June to August 2025. The FGD was carried out based on a letter of approval from the East Sumba Regency Government, dated June 10, 2025, which contained the appointment of the Tourism and Culture Office to assist and facilitate the availability of key respondents and informants in data collection. Participants in primary data collection include women involved in tourism management, tourism village managers, tourism awareness groups, village officials, and other relevant stakeholders. The study was carried out in eight tourism villages in East Sumba, located from east to southeast: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Lambanapu, and Prailiu. Village selection was based on their characteristics as cultural tourism sites with significant potential for women's empowerment. The village groups involved in the research are referred to as society.

The data analysis technique employs the Barometer of Tourism Sustainability (BTS) and AMOEBA of Tourism Sustainability Indicators (ATSI) methodologies. BTS elucidates the comprehensive sustainability level of human systems and ecosystems (Prescott-Allen, 1997), while ATSI explains the sustainability level of tourism indicators (Bell & Morse, 1999; Ten et al., 1991). The BTS and ATSI analysis techniques provide a visual overview of tourism management sustainability conditions in a geographical area (Ko, 2005). The sustainability barometer presents a systematic approach to measure and communicate community welfare and progress toward sustainable development, producing conclusions about human system and ecosystem conditions and the effects of human interaction with ecosystems. The BTS methodology provides opportunities for researchers to select their own indicators to measure humans and ecosystems as one integrated system and assess the entire system and its components (Guijt et al., 2001).

The research employs 32 indicators to measure tourism sustainability, termed Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1-2 are assessed as highly unsustainable, ratings 2-4 are assessed as less sustainable, rating 5 is assessed as neutral, ratings 6-7 are assessed as potentially sustainable, and ratings 8-10 are assessed as highly sustainable (Sugiyono, 2020). The measurement results of 32 indicators produce an AMOEBA visualization that depicts the sustainability level; the broader the AMOEBA visualization, the stronger the sustainability level. Technical analysis stages to produce AMOEBA visualizations encompass several phases: determining society, identifying systems, dimensions, and indicators, determining indicator weights and scales, calculating indicator scores, and implementing them in visual form. Research indicators are formulated based on relevant theoretical foundations, as presented in Table 1,

**Table 1.** Sustainable Indicator (SI)

Society		
Traditional Villages in East Sumba: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Prailiu, Lambanapu		
System	Dimension	Indicators
	Politic	SI1 Women occupy strategic positions in organizational management (Vujko et al., 2024)

		SI2	Women have opportunities to express their opinions (Mc Call & Mearns, 2021)
		SI3	Women participate in tourism development planning (Rahmawati & Darwis, 2023)
		SI4	Women develop women's institutions, such as the Family Welfare Movement (Wirdawati et al., 2024)
		SI5	Women are actively involved in various tourism business sectors (El-Manhaly & Taha., 2024)
	Economic	SI6	Women have opportunities to establish independent businesses in the tourism sector (Wardhani & Susilowati, 2021)
		SI7	Women generate income from tourism to strengthen the economy (Borovic' et al., 2022)
		SI8	Women experience increased economic independence (Rahmawati & Darwis, 2023)
	Social	SI9	Women gain self-confidence through tourism involvement (Vujko et al., 2024)
	Dimension	SI10	Women have opportunities to socialize through tourism businesses (El-Manhaly & Taha, 2024)
		SI11	Women achieve gender equality through the tourism business (Ghimire et al., 2024)
		SI12	Women possess awareness for self-development and future generations (Pécot et al., 2024)
The	Production	SI13	Women process environmentally friendly raw materials (El-Manhaly & Taha, 2024)
Human	Structure	SI14	Women play active roles in environmental and cultural conservation (Butler et al., 2022)
System		SI15	Women are actively involved in local infrastructure management (El-Manhaly & Taha, 2024)
		SI16	Women possess adequate skills and knowledge (Wirdawati et al., 2024)
The	Environmental	SI17	Fostering awareness to participate in environmental conservation actively
Ecosyste	Impacts	SI18	Long-term activities impact population density and congestion.
m	(Butler et al., 2022)	SI19	Tourism activities potentially generate waste from tourism-related activities.
		SI20	Tourism management potentially triggers conflicts among local communities.
	Ecosystem	SI21	Community-Based Tourism (CBT) has adequate water resources
	Quality (Yin et al., 2022)	SI22	CBT has adequate and representative land for the tourism business
		SI23	CBT maintains clean air quality that poses no risk to human health
		SI24	CBT implements tourism mitigation programs
	Tourism	SI25	CBT possesses a unique traditional culture
	diversity (Afifa & Nugroho, 2022)	SI26	CBT produces distinctive handicrafts
		SI27	CBT offers distinctive cuisine
		SI28	CBT features natural beauty based on archipelagic characteristics
	Enviromental	SI29	CBT maintains healthy governance and executes its functions and responsibilities
	Policy &	SI30	CBT implements sustainable tourism development programs
	Management	SI31	CBT establishes policies that regulate development
	(Kapera, 2018)	SI32	CBT maintains extensive cooperation with various stakeholders

Source: developed from Ko (2005)

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### 3. Results

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#### 3.1. General Overview of CBT in East Sumba

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The research utilizes eight CBTs, including Mondu, Lambanapu, Malumbi, Prailiu, Watuhadang, Rindi, Kaliuda, and Lainjanji. Mondu Village is located in Kanatang District, covering 90.45 km<sup>2</sup>. The tourism potential of Mondu Village includes savanna landscapes, Mangejing ritual culture, Padadita traditional village, Tanggedu waterfall, Kapihak Beach, and a creative economy through weaving, lontar leaf handicrafts, and statue carving. The population of Mondu Village totals 1,596 people, primarily engaged in farming, livestock breeding, and fishing. Lambanapu Village is situated in Kambera

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District, covering 795 hectares, with a population of 3,191. The area mainly consists of rice fields and agricultural land, so most residents work in farming. Its tourism attractions include the Kambaniru River, the Lambanapu archaeological site, the cultural house, weaving, the Tanau and Seribu hills, the Ori Angu Dance Studio, and the Li Luri Studio. Both Mondu and Lambanapu villages are vulnerable to flood disasters. Malumbi Village, located in East Wewewa District, spans 11.2 km<sup>2</sup> with 2,467 residents, mostly farmers and artisans. Its tourism potential includes the Kambaniru River and Dam, herbal hills, weaving, betel nut processing sites, and bamboo crafts. Prailiu Village is in Kahaungu Eti District, covering 51 hectares, with 7,874 residents working as farmers and artisans. Attractions include Prailiu Village, Hamayang (Traditional Ritual), Parunggara tour (Guest Welcome), Hambu marata (bride welcomed in the village of origin), Puru la kamaidu (harvest ceremony), Palupang Djara (Horse Racing), megalithic stones, mangrove tourism, Batu Payung Beach, traditional dance, ikat weaving crafts, and specialty foods like Manggulu, kaparak, instant ginger beverages, and moringa biscuits. Watuhadang Village, in Umalulu District, covers 1,020 hectares, with 2,954 residents engaged in farming, livestock breeding, and weaving. Its tourism potential includes traditional villages, megalithic graves, traditional houses, pahikung weaving, savanna hills, and the kendingan dance. Watuhadang is relatively safe from natural disasters. Rindi Village, in Rindi District, covers 57 km<sup>2</sup> and has 1,702 residents working mainly as farmers, livestock breeders, and fishermen. Its attractions consist of noble graves, the tarik bati tradition, the Praiyawang traditional village, and stone carving crafts. The village faces risks from floods and storms. Kaliuda Village, in Pahunga Lodu District, spans 110 hectares with 4,238 residents involved in farming, fishing, livestock breeding, and artisan work. Its tourism appeals include ancestral culture on woven fabrics and Priau customs, Marapu traditional funeral rituals, megalithic graves, weaving crafts, seaweed farming, the Nalu and Kanggoa Rivers, the Priau traditional village, Tandening savanna grassland (the longest savanna), and traditional dance. Kaliuda is vulnerable to natural hazards such as floods, tsunamis, and earthquakes. Lainjanji Village, in Wulla Waijilu District, covers 97.2 km<sup>2</sup> with 1,500 residents, who mainly work as farmers, plantation workers, and fishermen. The area's attractions include coastal flows and savanna grasslands. The tourism potential includes the Lainjanji River, Woranu River, Praibakal River, Watu Parunu Beach, hot springs, Watuparunu Beach, ikat weaving, and seaweed farming.

The selection of eight CBTs was based on regional characteristics and potential, specifically traditional cultural assets, weaving crafts, and natural resources from the archipelago. Villages known for weaving have significant potential to empower women because most weaving artisans are women. These eight CBTs present challenges to women's empowerment in tourism management, which can affect their families' economic independence. Based on data collected through observation, interviews, and documentation, the assessments of 32 indicators are shown in Table 2

**Table 2.** Sustainable Indicator (SI) Assessment

System	Dimension	Indicator	Rating	Score	System	Dimension	Indicator	Rating	Score
(1)	(2)	(4)	(6)	(7)	(1)	(2)	(4)	(6)	(7)
The Human System	Political	SI1	6,00	0,50	The Ecosystem	Environmental Impacts	SI17	7,00	0,51
		SI2	8,00	0,44			SI18	4,00	0,10
		SI3	6,00	0,33		SI19	6,00	0,44	
		SI4	9,00	0,25		SI20	6,00	0,29	
	Economic	SI5	7,00	0,58	Ecosystem Quality	SI21	4,00	0,29	
		SI6	7,00	0,19		SI22	6,00	0,44	

	SI7	6,00	0,50		SI23	7,00	0,34
	SI8	6,00	0,50		SI24	4,00	0,29
Social	SI9	7,00	0,39	Tourism	SI25	9,00	0,66
	SI10	8,00	0,44	diversity	SI26	9,00	0,66
	SI11	8,00	0,67		SI27	6,00	0,44
	SI12	7,00	0,39		SI28	9,00	0,44
Production	SI13	8,00	0,67	Environment	SI29	6,00	0,44
Structure	SI14	8,00	0,44	al Policy and	SI30	6,00	0,29
	SI15	5,00	0,14	Management	SI31	7,00	0,34
	SI16	6,00	0,44		SI32	7,00	0,51
		$\bar{x}=7$	<b>6,88</b>			$\bar{x}= 6,44$	<b>6,49</b>

Source: Authors (2025)

## 4. Discussion

### 4.1. Sustainability Level of The Human System in East Sumba Tourism

The human system in sustainable tourism is divided into four dimensions: political, economic, social, and production structure. Based on Table 2, the average rating for the human system assessment is 7, indicating potentially sustainable conditions. However, there are still relatively low scores of 5 on the women's empowerment indicator in local infrastructure management (SI15). Women's involvement in infrastructure management can be enhanced through homestay management, serving as the central accommodation for CBT. Most CBTs have not offered homestays due to limited knowledge and skills among staff regarding homestays. CBT in East Sumba has not provided homestays managed by renting out parts of residents' rooms as temporary housing for tourists. The existing homestays are separate accommodation businesses, managed independently from residents' houses; as a result, there is little interaction between tourists and hosts (Wijayanti & Dewi, 2023).

The political aspect is assessed through women's participation in institutions directly and indirectly linked to the tourism industry. As seen in Table 2, the highest rating indicator is 9, indicating that women in East Sumba run an organizational forum through community-based groups focused on family empowerment, specifically the Family Welfare Movement (S14) (Wirdawati et al., 2024). However, women's involvement in tourism-related organizations remains limited, especially in Tourism Awareness Groups and Tourism Village Management bodies. The hierarchy within tourism organizations is still male-dominated, which restricts women's roles in planning. Although women have opportunities to share their ideas and opinions verbally and in writing about tourism development (McCall et al., 2021), the management process from planning to oversight is mainly carried out by men. Women's active participation in East Sumba's tourism growth mainly focuses on tourism business activities, particularly in culinary services, the creative economy, and cultural preservation sectors.

The dimensional indicator measurements shown in Table 2 indicate that women's empowerment within the tourism industry has reached sustainability, but it has not led to significant economic growth. Women involved in tourism have not received coordinated and comprehensive support. Women's empowerment remains scattered across different sectors, lacking strong backing from key stakeholders. The most common form of women's empowerment in East Sumba's CBT involves weaving artisans. However, the business processes of these weavers lack integration, especially in the

production and marketing phases, which ultimately hampers long-term system development and sustainability.

Tourism development in East Sumba Regency aims to accelerate economic growth and improve family financial independence through women's empowerment initiatives. Women's empowerment is expected to boost tourism growth across the East Sumba region. According to 2024 data from East Sumba Regency, 64,630 women are housewives without income, making up 51.94% of the female population or 25.29% of the entire regional population. Women's involvement in East Sumba's tourism industry remains relatively constrained to small-scale operations, with limited active participation in establishing independent enterprises. This suboptimal women's empowerment constitutes the primary barrier to strengthening the family economy (Borovic et al., 2022).

Culinary attractions in East Sumba remain limited in both quantity and quality. The variety of cuisine offered lacks diversity and is presented simply with insufficient representation. Residents produce cuisine in relatively small quantities due to limited market access. Specialty dishes are not consistently available and are often only made upon request or during tourist visits. East Sumba's specialty dishes include Manggolu (made from kepok bananas and peanuts) and Kaparak (made from corn, rice, and sago). Other culinary options include Woba or seaweed from Kaliuda Village, lobster from Lainjanji Village, and instant ginger beverages and moringa biscuits from Prailiu Village. Women's empowerment in culinary management can be improved through increased training in culinary skills, packaging, and marketing strategies.

Women's active participation in the creative economy and cultural preservation sectors is clear through handicrafts and traditional dances that attract tourists. East Sumba's notable handicrafts include ikat-woven textiles and pahikung, which vary across villages. Women play key roles as artisans and keepers of weaving history and cultural traditions. East Sumba includes several weaving artisan communities, such as Karaja Sumba, Praiyawang, Pau, Prailiu, Kanatang, and Kaliuda.

East Sumba features various unique traditional dances with significant historical importance, often performed during traditional ceremonies and to welcome distinguished guests. These dances, as part of tourism attractions, are curated to offer compelling experiences for visitors. Some of the preserved dances in East Sumba include Hogor Watang from Kaliuda village, Tebe and Dho'a dances from Lainjanji village, Ori Angum Dance Studio and Li Luri Dance Studio from Lambanapu village, and Kendingan Dance from Watuhadang village.

Integrated tourism package development can serve as a strategy for enhancing family economies through women's empowerment in East Sumba. Tourism packages are designed from various potentials in an integrated and thematic approach, encompassing cultural assets, natural resources, creative economy, culinary offerings, and other potentials managed through women's empowerment. Integrated tourism packages provide substantial opportunities for women to participate actively in tourism enterprises, from planning through monitoring processes. Women have opportunities to develop thematic tourism packages related to weaving, integrated with other tourism potentials, thereby enabling woven fabric products to achieve higher economic value. Tourists demonstrate willingness to pay premium prices for tourism packages because they not only acquire woven fabrics as handicraft products but also gain historical and cultural experiences with considerable educational value. Thematic tourism packages stimulate economic acceleration by engaging resources in both quantity and quality, including women. Women serving as weaving artisans fulfill dual roles as woven fabric producers while packaging and presenting products to tourists.

Women in East Sumba recognize that women's empowerment in the tourism industry generates substantial social impacts. This understanding is reflected in relatively

high assessment scores of 7 and 8 (Table 2). Women's empowerment can actualize gender equality in tourism business management (Ghimire et al., 2024). Women receive equal opportunities with men to assume positions in tourism institutional management and operate tourism businesses. Women's active participation raises awareness regarding the importance of developing knowledge and skills concerning tourism (Pécot et al., 2024), thereby increasing self-confidence to participate and contribute to tourism enterprises (Vujko et al., 2024).

The production structure dimension, which encompasses both services and high-quality products, is a key element supporting the sustainability of the tourism area. Service elements are closely connected to human resource capacity as the leading actors in tourism management (Wirdawati et al., 2024). Success in CBT management heavily depends on local human resource capacity since it operates by, from, and for the community. In Table 2, ratings for indicators related to women's involvement in local infrastructure management and skills and knowledge in tourism sectors remain relatively low. This is supported by East Sumba Regency data from 2024, showing that community education is primarily at the primary school level, accounting for over 98%. Improving human resource capacity is a critical and urgent step toward achieving sustainable tourism. The quality of tourism products depends on effective management systems supported by sufficient infrastructure (El-Manhaly & Taha, 2024). In East Sumba, local infrastructure in tourism areas is still limited in both availability and accessibility. Restroom facilities, which are essential amenities for tourists, are scarce and often in poor condition. Increased involvement from various stakeholders is needed to accelerate the development of tourism infrastructure and enhance human resource capacity. Stakeholder programs related to infrastructure development include CSR efforts from Sarana Multi Infrastruktur (SMI) in partnership with Universitas Bina Sarana Informatika (UBSI). SMI has helped build restrooms, food courts, UV curing equipment for weaving, and water wells in Watuhadang village. At the same time, UBSI has provided training and support to boost human resource capacity.

According to Table 2, women's empowerment receives high ratings in processing environmentally sustainable raw materials and conservation efforts. Women actively participate in cultural conservation by maintaining weaving traditions and preserving traditional dances (Butler et al., 2022). The use of naturally sourced colouring materials for dyeing threads to be woven into fabrics, such as *Morinda citrifolia* roots, indigo leaves, tree bark, and clay, further demonstrates engagement with sustainable practices.

#### 4.2. Sustainability Ecosystem Level in Tourism Development in East Sumba Tourism

The second system in sustainable tourism comprises the ecosystem, consisting of four dimensions: Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Based on Table 2 data, the average rating value is 6.43, which overall falls within the potentially sustainable category. However, three indicators are considered less sustainable: long-term congestion potential (S118), adequate water availability (SI21), and tourism mitigation implementation (S124).

Tourism management in East Sumba generates both positive and negative consequences. Generally, tourism activities in East Sumba can foster local community awareness regarding the importance of environmental and cultural preservation as primary tourism industry products. Meanwhile, negative impacts arising from tourism activities include potential congestion due to increased tourist flow, waste management challenges, and conflicts among local communities (Butler et al., 2022). Waste issues in East Sumba are already becoming apparent, despite tourist visitation flows not yet being substantial. Plastic waste problems increasingly exacerbate environmental pollution on land and sea, as adequate waste management systems remain absent. From an

institutional perspective, tourism management potentially triggers conflicts within local communities. The primary factors causing internal conflicts include dysfunctional institutions, lack of transparency, and absence of clear programming.

The Ecosystem Quality dimension encompasses water resources, land, adequate clean air quality, and tourism mitigation (Yin et al., 2022). East Sumba represents a tourist area with extensive land coverage and clean air quality due to low pollution levels. In certain areas, water availability remains a fundamental challenge due to hilly topography and potential drought disasters. Natural springs constitute one water source for meeting community needs. Drought represents the primary disaster threatening the East Sumba region, while other disasters requiring attention include floods, earthquakes, and tornadoes. Disaster issues in any area significantly influence tourist interest, necessitating robust mitigation as security assurance for tourists. Tourism mitigation in the East Sumba region has not yet been implemented optimally.

The Tourism Diversity dimension constitutes the primary attraction for tourists, including cultural uniqueness, handicrafts, culinary offerings, and natural beauty. The East Sumba region possesses diverse and unique cultural tourism attractions in the form of traditional dances and customary ceremonies still preserved by local communities (Afifa & Nugroho, 2022). One customary ceremony that continues is the death ritual according to Marapu beliefs. This ceremony aims to escort the deceased's soul to the afterlife, where the body can be preserved for years because families must prepare substantial costs for the burial procession. East Sumba offers weaving crafts that access international markets. Woven textiles are created by predominantly female craftspeople, featuring various motifs that each possess their own philosophical significance. The culinary offerings remain severely limited, though some areas provide various fish preparations as fishery products from the archipelagic region. East Sumba represents an archipelagic region with marine natural potential in the form of beaches and fisheries. Beach potential holds tourist attraction with several characteristics, including sea-oriented interests and family travel patterns. The attractions offered by beach potential include striking natural scenery, exotic wildlife, and culture (Hall & Page, 2009), atmospheric freedom, peaceful environments, and local cuisine (Sharpley, 2012).

Sustainable tourism cannot be realized without the Environmental Policy and Management dimension, as an aspect ensuring system functionality. The Environmental Policy and Management dimension includes healthy institutions, development programs, policies, and cooperation with various parties (Kapera, 2018). The Environmental Policy and Management dimension is potentially sustainable with average values of 6 and 7. The institutions managing tourism in East Sumba remain suboptimal, evident from weak administration, ineffective management, and a lack of work programs. Tourism awareness group organizations and CBT managers, as two organizations with different functions and roles, are often perceived as identical organizations. This incorrect perspective regarding these organizations potentially triggers conflicts in tourism management. Tourism management remains incidental, lacking short-term, medium-term, and long-term planning, which can lead to unsustainable tourism. The government plays an important role in realizing sustainable tourism through policies that serve as references and protection in tourism management. The East Sumba district government, generally, and the Tourism Office, specifically, must issue policies related to tourism management and conduct regular training and assistance programs. The government represents one of the pentahelix elements that collaborate to support tourism management in East Sumba. Other pentahelix elements include academia, business, community, and media. The role of each pentahelix element in East Sumba tourism development includes: government as policymaker and facilitator, academia supporting human resource capacity building, business supporting infrastructure development

acceleration and capital provision, community supporting management systems, and media supporting publication as components of promotion and marketing. The government's role as policymaker is crucial to ensure legal protection in island-based CBT management that is vulnerable to degradation, and the optimization of women's empowerment.

4.3. Barometer of Tourism Sustainability (BTS)

Based on scoring values in Table 2, the axis value (X; Y) is (6.88; 6.49), which is positioned in the potentially sustainable quadrant, as presented in Figure 2. The potentially sustainable quadrant indicates that CBT in East Sumba offers opportunities for sustainable tourism development through efforts to balance the Human System and Ecosystem, facilitated by tourism pentahelix involvement. Collaboration with various parties can accelerate the optimization of sustainable indicators that currently have low ratings. The potentially sustainable condition can potentially decline to the intermediate quadrant or even to potentially unsustainable status if strategic improvement efforts through various stakeholder involvement are absent. Women as resources become a strategic alternative for realizing sustainable tourism through optimal empowerment. Several aspects that remain unbalanced in sustainable tourism optimization include: 1). Gender equality efforts, yet women in East Sumba have not received opportunities to hold management positions, have not received operational roles, and cannot manage businesses independently, 2). Efforts to realize ideal institutions, yet tourism institutions in the form of tourism awareness groups and tourism village managers have not implemented administrative procedures, lack transparency, and have no work programs, 3). Efforts to build quality ecosystems, yet mitigation systems are not sufficiently robust, and water availability is inadequate, 4). Waste management efforts, yet still utilizing plastic elements in food and beverage packaging, 5). Efforts to increase tourist attractions, yet culinary processing using local raw materials remains minimal.

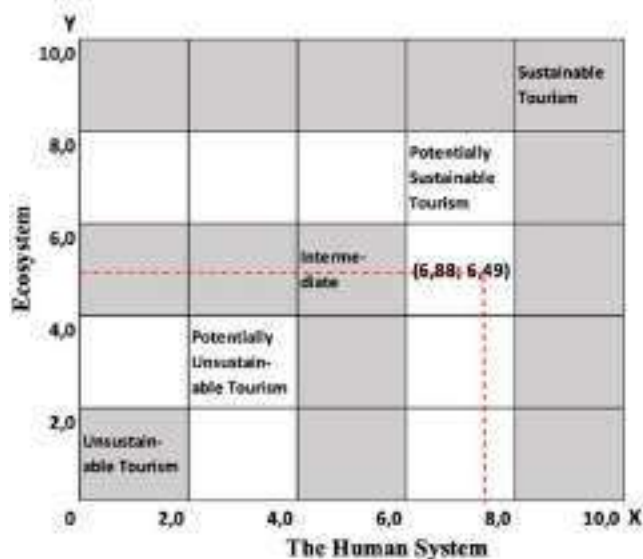
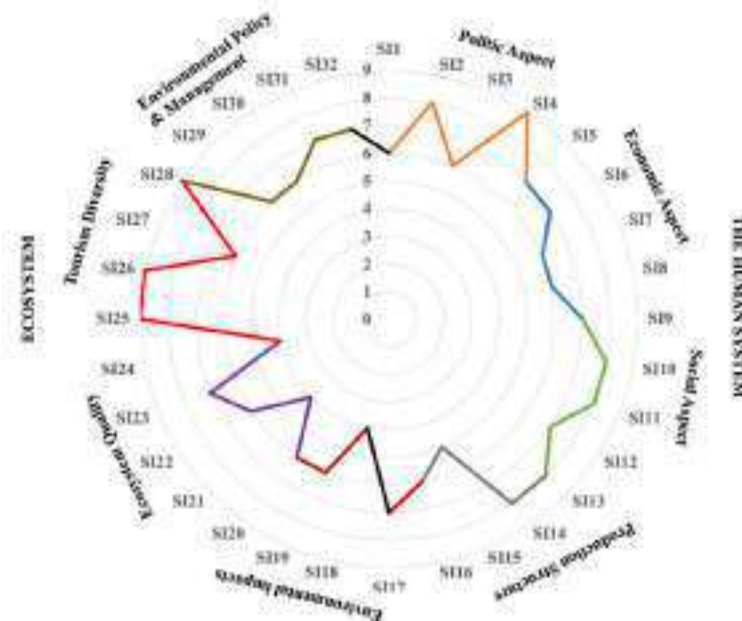


Figure 2. Barometer of Tourism Sustainability (BTS)  
Source: Authors (2025)

4.4. AMOEBA of Tourism Sustainability Indicator (ATSI)

Based on Table 2, the AMOEBA of Tourism Sustainability Indicator (ATSI) diagram is formulated. The visual AMOEBA depicts the level of tourism sustainability in East Sumba, as presented in Figure 3.



**Figure 3.** AMMOEBA of Tourism Sustainability Indicator (ATSI)

Source: Authors (2025)

Overall, the AMOEBA figure demonstrates potentially sustainable tourism development on East Sumba Island, as evidenced by the AMOEBA visualization having extensive coverage. The reach of pseudopodia indicates the magnitude of indicator values; the wider the reach, the higher the value. In the AMOEBA diagram, small pseudopodia are reaching with a rating value of 4, signifying a less sustainable status, namely indicators for long-term activities impacting density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Pseudopodia with extensive reach maintain a rating value of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), possess unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and exhibit archipelago-based natural beauty potential (SI28).

*4.5. Sustainable Tourism in East Sumba Archipelago through Women’s Empowerment*

Women’s empowerment for realizing tourism in East Sumba is conducted through active participation in CBT management from planning through monitoring. Women’s involvement in East Sumba’s CBT management remains limited and does not provide a significant impact on economic development for families or society broadly. Optimization of women’s empowerment is expected to reduce the still-elevated stunting rates on East Sumba Island.

CBT represents a tourism development pattern that emphasizes local community empowerment as a means for local communities to improve their economy through tourism business management (Steinicke & Neuburger, 2012). Empowerment of East Sumba communities, especially women, is fundamental to success in evaluating tourism development achievements. The most crucial empowerment component consists of empowered human resources that are effectively managed to achieve development objectives (Abdullah et al., 2022). Women’s empowerment becomes a strategic issue in East Sumba because it maintains long-term and significant relationships with poverty alleviation and stunting rate reduction. This assertion aligns with Adnyani’s (2024) research, which states that women’s roles in indigenous communities in managing Balinese cultural tourism impact family economic resilience. Women in Bali fulfill dual

roles through active involvement in various tourism businesses in Bali without abandoning family responsibilities.

Women's empowerment in the East Nusa Tenggara region faces various obstacles, including limited capital, unequal employment opportunities, and social gender stereotypes. However, there are significant opportunities for women to increase participation in the tourism industry that potentially improve welfare. Implementation of inclusive tourism in the East Nusa Tenggara region can provide economic benefits for local communities.

#### 4.6. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago

East Sumba, as an archipelagic region, possesses tourism potential that can become an economic driver. Island potential packaged as tourism packages in CBT management can improve family economic independence. Sustainable tourism plays a role in poverty alleviation through emphasis on several factors, including environmental factors (Neto, 2003), social factors, and political factors (Hall & Page, 2009). PPT can serve as an effective poverty alleviation tool and supports tentative steps to realize its potential. PPT implementation using sustainable development approaches through stakeholder involvement in the form of corporate social responsibility significantly impacts poverty alleviation (Diego, 2016).

Low PPT implementation from the business sector hinders tourism from fulfilling an effective role, tends toward stagnation, and experiences failure (Harrison, 2008). Business sector involvement through CSR programs provides internal and external company benefits that impact economic, socio-cultural, and environmental aspects. Internal benefits include building reputation and business sustainability through improved company image and customer loyalty. External benefits include sustainable development as corporate social responsibility toward broader society (Diego, 2016). CSR's role in tourism development on East Sumba Island remains relatively modest. One CSR entity involved in tourism management on East Sumba Island is SMI is an Indonesian State-Owned Enterprise operating in infrastructure financing. SMI's CSR program supports sustainable tourism development in Watuhadang Village by enhancing the quality of creative economy products in weaving and culinary sectors, improving restroom facilities, and increasing water availability through borehole construction. PT SMI constructed UV-curing equipment for weaving craftspeople to accelerate the drying process in producing woven fabrics. UV Curing availability significantly assists craftspeople in improving product quality and quantity. Food court construction realizes optimization of women's empowerment in the culinary sectors from raw material processing planning through product marketing. Meanwhile, borehole construction promotes ecosystem quality by ensuring adequate water availability to support tourism activities. Clean water availability represents one of the issues in the East Sumba region that maintains high potential for drought disasters.

CSR programs that can contribute positively to poverty alleviation possess several characteristics: suitability for impoverished rural areas; labor-intensive approaches; empowering women and communities representing economically disadvantaged populations; and encouraging tourist activities that provide business opportunities (Spenceley & Meyer, 2012). CSR represents a multifaceted concept encompassing four categories of community expectations (Carroll, 2017): (1) economic expectations (i.e., companies should be profitable), (2) legal expectations (i.e., companies should operate within legal boundaries), (3) ethical expectations (i.e., business operations should meet specific ethical standards not required by law), and (4) philanthropic or discretionary expectations (i.e., companies should voluntarily contribute to addressing social needs, including poverty alleviation). CSR activities are voluntary, so companies bear

consequences for their ethical or philanthropic responsibilities (Inoue & Lee, 2011). CSR maintains a substantial role in poverty alleviation through 'pro-poor CSR' programs. Pro-poor CSR encompasses several key initiatives, including poverty reduction, fostering relationships with local suppliers and informal sectors, promoting sustainable tourism practices, and preserving the natural environment of economically disadvantaged communities. Companies can collaborate with secondary stakeholders such as NGOs, government institutions, and international organizations (Smith & Ong, 2015)

## 5. Conclusions

Women represent a significant potential resource in East Sumba, given their considerable numbers and their status as unpaid family workers. Women's empowerment in East Sumba becomes a strategic issue due to cultural traditions and persistently strong patriarchal perspectives. Women play crucial roles in achieving family economic independence and reducing stunting rates through their involvement in tourism businesses. Tourism empowerment is measured using sustainable tourism approaches encompassing two inseparable systems: the human system and the ecosystem. The human system encompasses four key dimensions: political, economic, social, and production structure. In contrast, the ecosystem comprises Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Each dimension contains four indicators, resulting in 32 indicators for measuring tourism sustainability levels in East Sumba. Based on scoring results for 32 indicators, tourism in East Sumba falls within the potentially sustainable category, possessing sustainable opportunities through the adjustment and strengthening of several indicators. This research provides strategic recommendations to improve the status of sustainable tourism, focusing on implementing inclusive tourism through women's empowerment, creating thematic and integrated archipelago-based tourism packages, establishing healthy CBT institutions, and strengthening Pentahelix cooperation

This study provides several recommendations on women's empowerment in CBT in the archipelago. The implication of this research is to provide a broader understanding for various stakeholders, especially women, which has an impact on increasing involvement in the tourism industry. The active participation of women in the tourism business specifically has an impact on increasing family economic independence and generally has an impact on the economic movement of local communities in East Sumba Regency. Family economic independence in the short and medium term can significantly reduce stunting rates.

This research has limitations in the form of geographical space, which is an obstacle for researchers to reach all tourist villages in East Sumba Regency. East Sumba Regency has four tourist villages that have relatively far apart, as well as relatively difficult internet access, which is an obstacle in the data collection process. Researchers need time and effort to get representative data. The research only involved two systems, namely The Human System and Ecosystem which included eight dimensions and 32 indicators. Future research is expected to be able to reach fourteen tourist villages in East Sumba Regency. The research dimension can be enriched by involving other dimensions that have not been researched, including sociopreneur and investment in the development of CBT.

**Author Contributions:** A.W.: Devised the project, the main conceptual ideas, and a proof outline. A.W, and B.E.L.: Designed the model and the computational framework and analyzed the data. Atun Yulianto developed the theory and performed computations. A.W, B.E.L, and A.Y.: Contributed to the interpretation of the results. A.W.: Took the lead in writing the manuscript and provided final approval of the version to be published. A.W, B.E.L, and A.Y.: Provided critical feedback and helped shape the research, analysis, and manuscript.

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## Abbreviations

The following abbreviations are used in this manuscript:

CBT	Community-Based Tourism
PPT	Pro-Poor Tourism
CSR	Corporate Social Responsibility
BTS	Barometer of Tourism Sustainability
ATSI	AMOEBA of Tourism Sustainability Indicators
SI	Sustainability Indicator
SMI	Sarana Multi Infrastruktur
UBSI	Universitas Bina Sarana Informatika

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**No. 2**

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POINT MANUSCRIPT/  
*ISSUED NEED TO CONFIRM  
& REVISE***

**(14 Oktober 2025)**

The screenshot shows a Gmail interface with a dark sidebar on the left. The main content area displays an email from 'Economies Editorial Office' (economies@mdpi.com) dated 'Sel, 14 Okt 2025, 12.10'. The email subject is '[Economies] Manuscript ID: economies-3946451 - Issues Need to Confirm and Revise'. The body of the email contains the following text:

Dear Authors,

Thank you for your submission. The following issues need to be confirmed and revised:

1. We note that you have chosen "Open Review" for your paper. Please note that "Open Review" is different from "Open Access". "Open Review" means that when your paper is published online, the review reports and your responses will also be published. In other words, if you have chosen "Open Review", readers will be able to see your published paper with the review reports and your responses. If you have not selected "Open Review", readers will only be able to see your published paper. Please confirm that you wish to select "Open Review" for your paper.
2. [betel.lagarens3@gmail.com](mailto:betel.lagarens3@gmail.com) is not institutional email addresses. Please provide the institutional email addresses.
3. The "Data Availability Statement" section is missing. Please provide it to us.

Kind regards,

Eulalia Zhang  
Assistant Editor

The sidebar on the left shows various folders and labels: Mail (99+), Chat, Meet, Kotak Masuk (8.997), Berbintang, Ditunda, Penting, Terkirim, Draf (59), Kategori, Sosial (764), Info Terbaru (2.640), Forum (101), Promosi (3.492), Selengkapnya, and a Label section with options like [Imap]/Drafts, Prioritas, Tindak-lanjuti, and Selengkapnya.



Ani Wijayanti &lt;ani.awi@bsi.ac.id&gt;

---

**[Economies] Manuscript ID: economies-3946451 - Issues Need to Confirm and Revise**

5 pesan

**Economies Editorial Office** <economies@mdpi.com>

14 Oktober 2025 pukul 12.10

Balas Ke: Eulalia Zhang &lt;eulalia.zhang@mdpi.com&gt;, Economies Editorial Office &lt;economies@mdpi.com&gt;

Kepada: Ani Wijayanti &lt;ani.awi@bsi.a.id&gt;, Bet El Silisna Lagarensse &lt;betel.lagarensse3@gmail.com&gt;, Ani Wijayanti

&lt;ani.awi@bsi.ac.id&gt;

Cc: Economies Editorial Office &lt;economies@mdpi.com&gt;, Eulalia Zhang &lt;eulalia.zhang@mdpi.com&gt;

Dear Authors,

Thank you for your submission. The following issues need to be confirmed and revised:

1. We note that you have chosen "Open Review" for your paper. Please note that "Open Review" is different from "Open Access". "Open Review" means that when your paper is published online, the review reports and your responses will also be published. In other words, if you have chosen "Open Review", readers will be able to see your published paper with the review reports and your responses. If you have not selected "Open Review", readers will only be able to see your published paper. Please confirm that you wish to select "Open Review" for your paper.
2. [betel.lagarensse3@gmail.com](mailto:betel.lagarensse3@gmail.com) is not institutional email addresses. Please provide the institutional email addresses.
3. The "Data Availability Statement" section is missing. Please provide it to us.

Kind regards,

Eulalia Zhang  
Assistant Editor  
E-Mail: [eulalia.zhang@mdpi.com](mailto:eulalia.zhang@mdpi.com)

MDPI Branch Office, Nanjing  
15th Floor, Building 32, Xiaolongwan Headquarter Base, No. 70 Phoenix Road,  
Jiangning District, Nanjing

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We are pleased to share some exciting news: both the Impact Factor (IF) and CiteScore of International Journal of Financial Studies (IJFS) have increased! IJFS has achieved a new CiteScore of 4.6, up from 3.7, in the Finance category. The journal's Impact Factor (IF) has also risen to 2.2, up from 2.1, in the "Business, Finance" category.

---

**Ani Wijayanti** <ani.awi@bsi.ac.id>

14 Oktober 2025 pukul 14.19

Kepada: Eulalia Zhang &lt;eulalia.zhang@mdpi.com&gt;, Economies Editorial Office &lt;economies@mdpi.com&gt;

Cc: Ani Wijayanti &lt;ani.awi@bsi.a.id&gt;, Bet El Silisna Lagarensse &lt;betel.lagarensse3@gmail.com&gt;, Economies Editorial Office &lt;economies@mdpi.com&gt;, Eulalia Zhang &lt;eulalia.zhang@mdpi.com&gt;

Dear Editorial;

Thank you for your email. Here are our responses;

No	Note	Response
1	We note that you have chosen "Open Review" for your paper. Please note that "Open Review" is different from "Open Access". "Open Review" means that when your paper is published online, the review reports and your responses will also be published. In other words, if you have chosen "Open Review", readers will be able to see your published paper with the review reports and your responses. If you have not selected "Open Review", readers will only be able to see your published paper. Please confirm that you wish to select "Open Review" for your paper.	We misunderstood the term "Open Review"  We decided to "No Open Review"
2	<a href="mailto:betel.lagarens3@gmail.com">betel.lagarens3@gmail.com</a> is not institutional email addresses. Please provide the institutional email addresses.	The institutional email addresses is <a href="mailto:betlagarens3@polimdo.ac.id">betlagarens3@polimdo.ac.id</a>
3	The "Data Availability Statement" section is missing. Please provide it to us.	The file we uploaded previously had an error, and we have updated it.  The data that support the findings of this study are openly available at <a href="https://zenodo.org/records/17346982">https://zenodo.org/records/17346982</a> We also attached the Excel file.

Best regards,  
Ani Wijayanti

[Kutipan teks disembunyikan]

--

**Dr. Ani Wijayanti, M.M., M.MPar., CHE**

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**Supplementary\_Data.xlsx**

49K

**eulalia.zhang** <eulalia.zhang@mdpi.com>  
Balas Ke: eulalia.zhang@mdpi.com  
Kepada: Ani Wijayanti <ani.awi@bsi.ac.id>  
Cc: Bet El Silisna Lagarens3 <betel.lagarens3@gmail.com>, atun.aty@bsi.ac.id, Economies Editorial Office <economies@mdpi.com>

14 Oktober 2025 pukul 14.57



**No. 4**

**BUKTI KONFIRMASI  
REVISI MAYOR/ MAJOR  
REVISION**

**(4 November 2025)**

The screenshot shows a Gmail interface on a dark theme. On the left is a sidebar with navigation options: Mail (99+), Chat, and Meet. Below these are folders: Kotak Masuk (8,997), Berbintang, Ditunda, Penting, Terkirim, Draf (59), Kategori, Sosial (764), Info Terbaru (2,640), Forum (101), Promosi (3,492), and Selengkapnya. A 'Label' section is also visible with options like [Imap]/Drafts, Prioritas, Tindak-lanjuti, and Selengkapnya.

The main content area displays an email from Economies Editorial Office (economies@mdpi.com) sent on Nov 4, 2025, at 12:33. The subject is "[Economies] Manuscript ID: economies-3946451 - Major Revision". The email body contains the following text:

Dear Dr. Wijayanti, Professor Lagarensa,

Thank you again for your manuscript submission:

Manuscript ID: **economies-3946451**  
 Type of manuscript: Article  
 Title: A Sustainable Development Approach to Women's Empowerment in Increasing Household Economic: Pro-poor Tourism Concept in the Archipelago Area  
 Authors: Ani Wijayanti \*, Bet El Silisna Lagarensa \*, Atun Yulianto  
 Received: 9 Oct 2025  
 E-mails: [ani.awi@bsi.ac.id](mailto:ani.awi@bsi.ac.id), [betlagarensa@polimdo.ac.id](mailto:betlagarensa@polimdo.ac.id), [atun.aty@bsi.ac.id](mailto:atun.aty@bsi.ac.id)  
 Section: Labour and Education

[https://www.mdpi.com/journal/economies/sections/labour\\_and\\_education](https://www.mdpi.com/journal/economies/sections/labour_and_education)

Your manuscript has now been reviewed by experts in the field and can be found with the review reports at:  
<https://susy.mdpi.com/user/manuscripts/resubmit/88a898e3438dead1974eda9f051535c6>

Please revise the manuscript found at the above link according to the reviewers' comments and upload the revised file within 10 days. Note the following check-list:

# Reviewer #1

## Response to Reviewer X Comments

### 1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation	Reviewer's Evaluation	Response and Revisions
Does the introduction provide sufficient background and include all relevant references?	Yes	
Are all the cited references relevant to the research?	Yes	
Is the research design appropriate?	Yes	
Are the methods adequately described?	Can be improved	
Are the results clearly presented?	Yes	
Are the conclusions supported by the results?	Yes	
Are all figures and tables clear and well-presented?	Can be improved	

### 3. Point-by-point response to Comments and Suggestions for Authors

#### Comments 1:

In line 52, it is stated that the unemployment rate decreased by 3.35%. However, based on the context — “*The poverty rate decreased by 3.35%, from 31.43% in 2016 to 28.08% in 2023 (Central Statistics Agency of East Sumba, 2025)*” — it is evident that this refers to a decline of **3.35 percentage points**, not **3.35 percent**.

#### Comments 2:

In lines 106 and 107, it is stated that there was a 40% increase in the period from 2021 to 2023. It should be clarified whether this figure represents an **actual increase of 40 percent in the number of tourists**, or whether it should instead be expressed as an increase of **40 percentage points**.

**Comments 3:**

In the methodology section, there is no explanation of how the scoring values presented in Table 2 were calculated for each indicator. The Excel file includes calculations based on significance levels and weights; however, the methodology section does not explain how the weights were assigned or where the significance level values were obtained.

**Comments 4:**

Furthermore, the description does not specify the sources of the secondary data (data obtained from third-party sources, both online and offline) mentioned in line 329. It is necessary to indicate both the **sources** and the **time period** from which these data were obtained.

**Comments 5:**

It appears that parts of the discussion of the results should be included in the Results section. However, the results are currently discussed within the Discussion section (for example, in Sections 4.3 and 4.4). It is recommended to revise both sections so that the presentation and interpretation of results are placed in the Results section, while the Discussion section is reserved for recommendations, comments, and proposed solutions. Where appropriate, these recommendations may explicitly refer to the relevant parts of the Results section.

**Comments 6:**

In Figure 2, the scales on both axes appear to be inaccurate. The points **6.88** and **6.49** on the *Ecosystem* axis are positioned below 6, while on the *Human System* axis they are placed too close to 8.

**Comments 7:**

Authors need to revise discussions by focusing on theoretical implications and managerial implications, not just only results of the study. At the earlier comment, authors need to revise by focusing on the concepts – Woman, PPT, CSR. This should be mentioned clearly on Discussion and conclusion.

# Reviewer #2

## Response to Reviewer X Comments

### 1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation	Reviewer's Evaluation	Response and Revisions
Does the introduction provide sufficient background and include all relevant references?	Yes	
Is the research design appropriate?	Can be improved	
Are the methods adequately described?	Can be improved	
Are the results clearly presented?	Must be improved	
Are the conclusions supported by the results?	Can be improved	
Are all figures and tables clear and well-presented?	Can be improved	

### 3. Point-by-point response to Comments and Suggestions for Authors

#### Comments 1:

Page 2 Line 54 – 84 Authors mention about tourism, CBT, PPT, and CSR. In this case, authors connect PPT with CSR. This is very interesting gap for this project. However, in Line 71 – 84, authors need to discuss between PPT and CSR by focusing on PPT as the concept of the study, and demonstrate that CSR is a guideline for driving PPT.

#### Comments 2:

Page 2 -7 Introduction Authors need to revise by focusing on main concepts and context of the study. Authors need to discuss and demonstrate whether 'sustainable tourism', PPT, CSR, Island Tourism, or woman empowerment, is the main concept of the study, or authors are synthesizing PPT with woman empowerment. For the context, it is East Sumba Island (island tourism), or woman community. Authors need to mention clearly. Headings or sub-headings at the Introduction can help to readers understanding the story of this paper because 6 pages

for Introduction is too long. However, the important issue is whether authors can demonstrate research problems clearly or not.

**Comments 3:**

Page 7, Line 301. Authors need to provide research gap or contribution clearly before next paragraph. What did authors focus on this research – solving tourism problems or issues, driving woman empowerment in CBT, drive island tourism through PPT and CSR, or conduct case study of woman empowerment in island tourism. Then the next section is the purposes of the study.

**Comments 4:**

Page 8, Line 342-348 Barometer of Tourism sustainability. What is it? How did authors calculate or manage? How did you interpret 5 level of Barometer?

**Comments 5:**

Page 8, Line 365-368 What is AMOEBA visualization.

**Comments 6:**

Page 8 Methodology: how authors evaluate the Score, need to be mentioned. It seems that authors assess the score through variables in Table 1 (Page 9), only one score assessment. Is it correct? If yes, how authors can ensure that the data are reliability and validity. If not, please clarify this issue.

**Comments 7:**

Page 8. Authors need to demonstrate how authors analyzed data – quantitative and qualitative research.

**Comments 8:**

Page 10. Results: authors need to demonstrate results to answer research problems (mentioned above)

**Comments 9:**

Page 11 Line 423

Table 2, authors need to explain the results of this table. What is the meaning of Rating 6.00 and Score 0.50?

**Comments 10:**

Page 11 Discussions: authors need to mention contribution clearly at the first paragraph of Discussion. In Line 426 – 430, score 7 or 5: Can authors compare with other places or cities? If yes, how authors rely on this score. If authors apply this questionnaires or assessment to other places or studies, the results can compare.

# Reviewer # 3

## Response to Reviewer X Comments

### 1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation	Reviewer's Evaluation	Response and Revisions
Does the introduction provide sufficient background and include all relevant references?	Yes	
Is the research design appropriate?	Yes	
Are the methods adequately described?	Yes	
Are the results clearly presented?	Can be improved	
Are the conclusions supported by the results?	Can be improved	
Are all figures and tables clear and well-presented?	Yes	

### 3. Point-by-point response to Comments and Suggestions for Authors

#### Comments 1:

This study is important, not only in terms of the subject it addresses, but also in terms of the methodology it uses to demonstrate what it set out to achieve.

In my opinion, I believe that the final part of the title would be more explicit if it were... *Concept in Est Sumba (Indonesia)* – I leave this suggestion.

#### Comments 2:

The section on the subject's context is well structured. However, it could have been better consolidated, namely by presenting other studies or case studies that illustrate the methodology applied here

#### Comments 3:

In terms of conclusions, in addition to what was identified by the study, it was important

to know HOW? How and in what way can the results identified by the study be achieved? To this end, something more economic could have been presented, in response to the journal to which the paper was submitted.

**Comments 4:**

Of the 94 sources referenced in the bibliography, only 34% are articles from the last 5 years;

**Comments 5:**

Sources referenced but not included in the bibliography: Carvalho, 2018 (line 197)/Choi, 2010 (line 262)/ Junaid et al., 2021(line 278).

**Comments 6:**

Sources incorrectly placed in the bibliography: Hizmi & Junaid, 2023 (line 277)/ Murillo & Orozco, 2006).

**Comments 7:**

There is a wide range of bibliography on the issue of Social Responsibility and Poverty, with some of the authors being well known in the field, such as Ashley, Caroline and Goodwin, Harold, among many others.



**No. 5**

**BUKTI KONFIRMASI  
PENERIMAAN REVISI/  
*REVISION RECEIVED &*  
RESPON TERHADAP  
REVIEWER**

**(12 November 2025)**

The image shows a Gmail interface on a dark theme. On the left is a sidebar with navigation options: Mail (99+), Chat, and Meet. The main inbox area lists folders: Kotak Masuk (8,997), Berbintang, Ditunda, Penting, Terkirim, Draf (59), Kategori, Sosial (764), Info Terbaru (2,640), Forum (101), Promosi (3,492), and Selengkapnya. Below these are labels: [Imap]/Drafts, Prioritas, Tindak-lanjuti, and Selengkapnya. The top of the inbox shows a search bar with 'economies article submission received' and a status 'Aktif'. An email is open, showing the subject '[Economies] Manuscript ID: economies-3946451 - Revised Version Received' with 'External' and 'Kotak Masuk' tags. The sender is 'Economies Editorial Office <economies@mdpi.com>' dated 'Rab, 12 Nov 2025, 21.33'. The email body contains a thank you message and details about the manuscript submission.

**[Economies] Manuscript ID: economies-3946451 - Revised Version Received** External Kotak Masuk x

**Economies Editorial Office** <economies@mdpi.com> Rab, 12 Nov 2025, 21.33

kepada Bet, saya, Atun, Economies

Dear Dr. Wijayanti, Professor Lagarensse,

Thank you very much for providing the revised version of your paper:

Manuscript ID: **economies-3946451**  
Type of manuscript: **Article**  
Title: A Sustainable Development Approach to Women's Empowerment in Increasing Household Economic: Pro-poor Tourism Concept in the Archipelago Area  
Authors: Ani Wijayanti \*, Bet El Silisna Lagarensse \*, Atun Yulianto  
**Received**: 9 Oct 2025  
E-mails: [ani.awi@bsi.ac.id](mailto:ani.awi@bsi.ac.id), [betlagarensse@polimdo.ac.id](mailto:betlagarensse@polimdo.ac.id), [atun.aty@bsi.ac.id](mailto:atun.aty@bsi.ac.id)  
Labour and Education  
[https://www.mdpi.com/journal/economies/sections/labour\\_and\\_education](https://www.mdpi.com/journal/economies/sections/labour_and_education)  
[https://susy.mdpi.com/user/manuscripts/review\\_info/88a898e3438dead1974eda9f051535c6](https://susy.mdpi.com/user/manuscripts/review_info/88a898e3438dead1974eda9f051535c6)

We will continue processing your paper and will keep you informed about the status of your **submission**.

Kind regards,  
Ms. Helen Zhang  
Managing Editor  
E-mail: [hongyan.zhang@mdpi.com](mailto:hongyan.zhang@mdpi.com)

# Reviewer #1

## Response to Reviewer X Comments

### 1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation	Reviewer's Evaluation	Response and Revisions
Does the introduction provide sufficient background and include all relevant references?	Yes	
Are all the cited references relevant to the research?	Yes	
Is the research design appropriate?	Yes	
Are the methods adequately described?	Can be improved	The methodology has been redesigned
Are the results clearly presented?	Yes	
Are the conclusions supported by the results?	Yes	
Are all figures and tables clear and well-presented?	Can be improved	The figure and tabel have ben updated

### 3. Point-by-point response to Comments and Suggestions for Authors

#### Comments 1:

In line 52, it is stated that the unemployment rate decreased by 3.35%. However, based on the context — “The poverty rate decreased by 3.35%, from 31.43% in 2016 to 28.08% in 2023 (Central Statistics Agency of East Sumba, 2025)” — it is evident that this refers to a decline of **3.35 percentage points**, not **3.35 percent**.

#### Response 1:

Dear Profesor, Thank you for pointing this out. We agree with this comment and recognize that the narrative we presented was inaccurate. To address this, we have rewritten it using more detailed sentences. The revised version is as follows:

*Four years later, in 2024, it was successfully ranked as a developing region based on a decrease in the poverty rate, one of the critical indicators. According to data from the Central Statistics Agency of East Sumba*

*(2025), the poverty rates for 2020, 2021, 2022, and 2023 were 29.65%, 29.68%, 28.22%, and 28.08%, respectively. (Page 2, Line 39 – 42)*

### **Comments 2:**

In lines 106 and 107, it is stated that there was a 40% increase in the period from 2021 to 2023. It should be clarified whether this figure represents an **actual increase of 40 percent in the number of tourists**, or whether it should instead be expressed as an increase of **40 percentage points**.

### **Response 2:**

Dear Profesor,

Thank you for your feedback. We agree with your comment. We did not present the data clearly, just as with the data on poverty. Below, we present the detailed data on annual tourist visits.

*This potential is further highlighted by the regency's growing tourist appeal, as evident in the increase in foreign and domestic tourists from 2021 to 2023. The number of international tourist visits from 2021 to 2023 was 87 (2021), 813 (2022), and 2,121 (2023). Meanwhile, the number of domestic tourist visits was 18,489 (2021), 34,083 (2022), and 50,635 (2023). (Page 2, Line 47-51).*

### **Comments 3:**

In the methodology section, there is no explanation of how the scoring values presented in Table 2 were calculated for each indicator. The Excel file includes calculations based on significance levels and weights; however, the methodology section does not explain how the weights were assigned or where the significance level values were obtained.

### **Response 3:**

Dear Profesor,

Thank you for pointing this out. We have not yet provided details in the methodology section. We have updated the narrative on data analysis techniques, expanding it to two paragraphs. The first paragraph describes the BTS and ATSI methods, while the second paragraph explains the data analysis system, including weighting techniques. We have also added the weighting results to Table 2: Sustainable Indicator Assessment.

*BTS and ATSI analysis techniques provide a visual overview of the sustainability conditions of tourism management in a geographical area (Ko, 2005). The BTS and ATSI analysis stages comprise several phases: determining the community; identifying the system, dimensions, and indicators; determining the indicator weights and scales; calculating indicator scores; and presenting the results in visual form. The research employs 32 indicators to measure tourism sustainability, referred to as Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1-2 are assessed as highly unsustainable, ratings 2-4 are*

*evaluated as less sustainable, rating 5 is estimated as neutral, ratings 6-7 are evaluated as potentially sustainable, and ratings 8-10 are assessed as highly sustainable (Sugiyono, 2020). Each indicator is assigned a weighting based on its contribution to the system being measured. The measurement results from 32 indicators, obtained through the rating process, are entered into a table and multiplied by their respective weights to produce a score. The total score for each system produces coordinates that are presented on the Barometer graph, while the rating values are presented in the AMOEBA visualisation. (Page 6, Line 240-261)*

**Comments 4:**

Furthermore, the description does not specify the sources of the secondary data (data obtained from third-party sources, both online and offline) mentioned in line 329. It is necessary to indicate both the **sources** and the **time period** from which these data were obtained.

**Response 4:**

Dear Profesor,

Thank you for your input.

We have added information about secondary data to the methodology section in the research design subchapter.

*Secondary data from third parties was obtained from the tourism office, the central statistics agency, and stakeholders involved in CBT management, including CBT management documents, tourism development programmes, and related data. Secondary data was collected over a period of five months, from April to August 2025. (Page 5-6, Line 211-215)*

**Comments 5:**

It appears that parts of the discussion of the results should be included in the Results section. However, the results are currently discussed within the Discussion section (for example, in Sections 4.3 and 4.4). It is recommended to revise both sections so that the presentation and interpretation of results are placed in the Results section, while the Discussion section is reserved for recommendations, comments, and proposed solutions. Where appropriate, these recommendations may explicitly refer to the relevant parts of the Results section.

**Response 5:**

Dear Profesor,

We agree with your opinion, and we have restructured the presentation of the results and discussion. We have moved several paragraphs from the discussion section to the results section, where they are more appropriately placed. Chapter Results on **line 266** and Chapter Discussion on **line 341**

**Comments 6:**

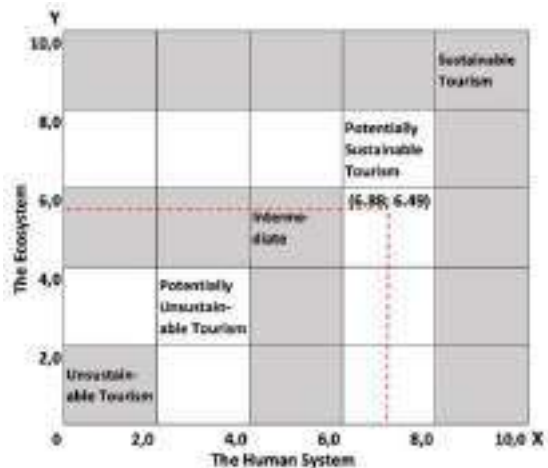
In Figure 2, the scales on both axes appear to be inaccurate. The points **6.88** and **6.49** on the *Ecosystem* axis are positioned below 6, while on the *Human System* axis they are placed too close to 8.

### Response 6:

Dear Profesor,

Thank you very much for your input.

We realise that the coordinates in image 2 were inaccurate and imprecise. We have revised the coordinates to make them more precise, as follows: (Page 9)



### Comments 7:

Authors need to revise discussions by focusing on theoretical implications and managerial implications, not just only results of the study. At the earlier comment, authors need to revise by focusing on the concepts – Woman, PPT, CSR. This should be mentioned clearly on Discussion and conclusion.

### Response 7:

Dear Profesor.

Thank you for pointing this out.

We have attempted to present several implications for interpretation in subsections 4.1, 4.2, 4.4, and 4.5. In addition, we have added a subsection 4.3 titled 'Implications Arising from the Redesigned Results and Discussion,' which discusses the implications specifically introduced by the new presentation format. These changes aim to clarify our findings and provide deeper insight into the potential impact of our results.

4.3. The Harmonization between the Human System and the Ecosystem of Sustainable Tourism Development in East Sumba (Page 14, Line 525-568)

The theoretical and practical implications have been added to the Conclusion section.

*The theoretical implication of this research is to enrich references on women's empowerment in island tourism areas. The references offer concepts of inclusive and pro-poor tourism management. Island tourism areas have unique and vulnerable characteristics, so this study is expected to provide strategic references. In practical terms, this study provides an overview of the sustainability of tourism developed in the Sumba Island tourism area through women's empowerment. The existing conditions serve as a reference for relevant stakeholders to formulate plans for Sumba women's participation in supporting sustainable tourism management. (Page 16, 662-669).*

# Reviewer #2

## Response to Reviewer X Comments

### 1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation	Reviewer's Evaluation	Response and Revisions
Does the introduction provide sufficient background and include all relevant references?	Yes	
Is the research design appropriate?	Can be improved	The research design has been improved as response below
Are the methods adequately described?	Can be improved	The methodology has been improved as response below
Are the results clearly presented?	Must be improved	The result has been improved and redesign as response below
Are the conclusions supported by the results?	Can be improved	The conclusion has been improved as response below
Are all figures and tables clear and well-presented?	Can be improved	The figures and table have been improved

### 3. Point-by-point response to Comments and Suggestions for Authors

#### Comments 1:

Page 2 Line 54 – 84 Authors mention about tourism, CBT, PPT, and CSR. In this case, authors connect PPT with CSR. This is very interesting gap for this project. However, in Line 71 – 84, authors need to discuss between PPT and CSR by focusing on PPT as the concept of the study, and demonstrate that CSR is a guideline for driving PPT.

#### Response 1:

Dear Professor,

Thank you very much for emphasising the link between PPT and CSR. We have updated the narrative to reinforce the concept of PPT and to highlight CSR as a programme that can drive PPT's success. The narrative we present is as follows:

*Managing island tourism through local community empowerment is a concept of pro-poor tourism (PPT) (Yang et al., 2021). PPT has developed since the early 2000s as a concept of sustainable tourism development through local community empowerment. Sustainable island tourism management can drive economic and social transformation (Cao et al., 2021). PPT can reduce poverty (Çolak et al., 2023) and have an impact on the environment and society through cooperation between various stakeholders (Wen et al., 2021). The implementation of PPT without involving the business sector has led to ineffectiveness, stagnation, and the failure of tourism businesses. CSR programmes are one form of collaboration to realise PPT. CSR programmes can harmonise cultural preservation and economic interests to realise sustainable tourism through various innovative initiatives (Wu et al., 2023). The PPT programme is implemented through a social innovation approach and the strengthening of traditions to encourage the transformation of community power structures (Hazenberget al., 2025). Based on East Sumba statistics for 2024, women's empowerment remains comparatively limited. The majority of women in East Sumba are homemakers without income-generating activities (family workers or unpaid laborers), totaling 64,630, due to restricted opportunities for active participation in industrial sectors (Central Statistics Agency of East Sumba, 2025). (Page 2, Line 69-85).*

#### **Comments 2:**

Page 2 -7 Introduction Authors need to revise by focusing on main concepts and context of the study. Authors need to discuss and demonstrate whether 'sustainable tourism', PPT, CSR, Island Tourism, or woman empowerment, is the main concept of the study, or authors are synthesizing PPT with woman empowerment. For the context, it is East Sumba Island (island tourism), or woman community. Authors need to mention clearly. Headings or sub-headings at the Introduction can help to readers understanding the story of this paper because 6 pages for Introduction is too long. However, the important issue is whether authors can demonstrate research problems clearly or not.

#### **Response 2:**

Dear Profesor,

Thank you for pointing this out. We agree with this comment. We realise that our introduction is quite long, as it covers the research background and literature review, and includes references to important indicators in the research. Based on your input, we have redesigned our introduction to make it more structured. The introduction now includes: 1) a description of island tourism and PPT in management of island attractions; 2) the PPT concept and its application through CSR programmes; 3) examination of PPT for vulnerable groups and an analysis of women's empowerment and key strategic issues in island tourism regions; 4) a review of assessment indicators for measuring women's empowerment; and 5) explanation of research objectives and an overview of relevant previous studies. **(Page 2 to 5)**

### **Comments 3:**

Page 7, Line 301. Authors need to provide research gap or contribution clearly before next paragraph. What did authors focus on this research – solving tourism problems or issues, driving woman empowerment in CBT, drive island tourism through PPT and CSR, or conduct case study of woman empowerment in island tourism. Then the next section is the purposes of the study.

### **Response 3:**

Dear Professor,

Thank you. For pointing this out. We realise that the previous introduction did not sufficiently emphasise the research gap.

*Based on your guidance, we have completely redesigned the introduction. Our emphasis is on solving the problem of sustainable tourism management by empowering women through PPT in island tourism areas. (Page 2 to 5).*

### **Comments 4:**

Page 8, Line 342-348 Barometer of Tourism sustainability. What is it? How did authors calculate or manage? How did you interpret 5 level of Barometer?

### **Response 4:**

Dear Professor,

Thank you for your feedback.

We have updated the narrative on the methodology related to the barometer, as presented in the following sentence:

*The Barometer of Tourism Sustainability BTS elucidates the comprehensive sustainability level of human systems and ecosystems (Prescott-Allen, 1997). The sustainability barometer presents a systematic approach to measuring and communicating community welfare and progress toward sustainable development, producing conclusions about human systems and ecosystem conditions, and the effects of human interaction with ecosystems. The BTS methodology provides researchers with the opportunity to select their own indicators to measure humans and ecosystems as an integrated system and to assess the entire system and its components (Guijt et al., 2001). The system barometer presents the sustainability of tourism management in five ratings. These ratings are measured on a score range: Unsustainable Tourism ( $0 \geq X > 2$ ), Potentially Unsustainable Tourism ( $2 \geq X > 4$ ), Intermediate ( $4 \geq X > 6$ ), Potentially Sustainable Tourism ( $6 \geq X > 8$ ), and Sustainable Tourism ( $8 \geq X \leq 10$ ). The barometer also presents the coordinates of measurement results for 32 indicators that describe the sustainability status of tourism management. (Page 6, Line 222-234)*

### **Comments 5:**

Page 8, Line 365-368 What is AMOEBA visualization.

### **Response 5:**

Dear Professor,

Thank you for your feedback.

Similar to the explanation regarding the Barometer, we have updated the narrative on the methodology related to AMOEBA as presented in the following sentence:

*AMOEBa of Tourism Sustainability Indicators (ATSI) explains the sustainability level of these tourism indicators (Bell & Morse, 1999; Ten et al., 1991). ATSI is the result of measurements from 32 indicators. It is presented in the AMOEBA visualisation, which illustrates the level of sustainability: the wider the AMOEBA, the stronger the sustainability. The ATSI visualisation design uses a radar chart in Excel. (Page 6, Line 235-239).*

#### **Comments 6:**

Page 8 Methodology: how authors evaluate the Score, need to be mentioned. It seems that authors assess the score through variables in Table 1 (Page 9), only one score assessment. Is it correct? If yes, how authors can ensure that the data are reliability and validity. If not, please clarify this issue.

#### **Response 6:**

Dear Professor,

Thank you for pointing this out. We agree with this comment. We have not provided a systematic explanation of the scoring system. We also realise that the weighting column in Table 2 has not been presented. We have rewritten the data analysis technique in the methodology section and added the weighting results to Table 2. We have re-narrated the explanation regarding data analysis techniques, which we present in the following paragraph:

*BTS and ATSI analysis techniques provide a visual overview of the sustainability conditions of tourism management in a geographical area (Ko, 2005). The BTS and ATSI analysis stages comprise several phases: determining the community; identifying the system, dimensions, and indicators; determining the indicator weights and scales; calculating indicator scores; and presenting the results in visual form. The research employs 32 indicators to measure tourism sustainability, referred to as Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1-2 are assessed as highly unsustainable, ratings 2-4 are evaluated as less sustainable, rating 5 is estimated as neutral, ratings 6-7 are evaluated as potentially sustainable, and ratings 8-10 are assessed as highly sustainable (Sugiyono, 2020). Each indicator is assigned a weighting based on its contribution to the system being measured. The measurement results from 32 indicators, obtained through the rating process, are entered into a table and multiplied by their respective weights to produce a score. The total score for each system produces coordinates that are presented on the Barometer graph, while the rating values are presented in the AMOEBA visualisation. (Page 6, Line 241-259)*

The author guarantees the reliability and validity of the data, as the instruments used have been verified by previous researchers in an article entitled: Development of a tourism sustainability assessment procedure: a conceptual approach (Ko, 2005); Sustainability Indicators Measuring the Immeasurable? (Bell & Morse, 1999). A quantitative method for description and assessment of ecosystems: The AMOEBA-approach (Ten et al., 1991). (Page 6, Line 236-241).

**Comments 7:**

Page 8. Authors need to demonstrate how authors analyzed data – quantitative and qualitative research.

**Response 7:**

Dear Profesor,

We have updated the narrative in the methodology section, which now covers two subchapters: research design and data analysis techniques. The methodology narrative explains in more detail the mixed-method approach used in the study.

**Comments 8:**

Page 10. Results: authors need to demonstrate results to answer research problems (mentioned above)

**Response 8:**

Dear Profesor,

We present our research results in the results chapter, which are then interpreted in detail to answer the research questions in the discussion section, which covers five subchapters, namely:

*4.1. Sustainability Level of The Human System in East Sumba Tourism*

*4.2. Sustainability Ecosystem Level in Tourism Development in East Sumba Tourism*

*4.3. The Harmonization between the Human System and the Ecosystem of Sustainable Tourism Development in East Sumba*

*4.4. Sustainable Tourism in East Sumba Archipelago through Women's Empowerment*

*4.5. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago*

(Page 10-16)

**Comments 9:**

Page 11 Line 423

Table 2, authors need to explain the results of this table. What is the meaning of Rating 6.00 and Score 0.50?

**Response 9:**

Dear Profesor,

We have added a narrative explaining the meaning of the figures presented in Table 2.

*Table 2 shows the results of sustainable tourism measurements using human systems and ecosystems, covering eight subsystems. The rating value presents measurement results for 32 weighted indicators. The*

score is calculated by multiplying the weighted value by the rating value. In Table 2, column 1 lists a rating of 6 for the sustainable indicator (SII). The score of 0.5 is the product of the weighted value and the rating value. The total indicator score for the human system is the X-coordinate value. The total score for the ecosystem indicator is the Y-coordinate value, representing the sustainable condition in the Barometer graph. The rating value also shows the sustainable condition for each indicator, as presented in the AMOEBA visualisation. (Page 9, Line: 317-324)

### **Comments 10:**

Page 11 Discussions: authors need to mention contribution clearly at the first paragraph of Discussion. In Line 426 – 430, score 7 or 5: Can authors compare with other places or cities? If yes, how authors rely on this score. If authors apply this questionnaires or assessment to other places or studies, the results can compare.

### **Response 10:**

Dear Profesor,

We have presented an interpretation of the scores in Table 2 and added a narrative on the implications of women's empowerment in other cities.

*The human system in sustainable tourism comprises political, economic, social, and production dimensions. Table 2 shows that the average human system assessment is 7, indicating potentially sustainable conditions. However, the women's empowerment indicator in local infrastructure management (SI15) shows relatively low scores of 5. Women's involvement can be improved by making homestay management a central accommodation for CBT. Most CBTs have not provided homestays due to limited staff knowledge and skills, instead renting parts of residents' rooms for tourists. Existing homestays operate independently from residents' houses, resulting in little interaction between tourists and hosts ([Wijayanti & Dewi, 2023](#)). Women's empowerment has reached relatively optimal levels in several tourist destinations, such as Bali, Banyuwangi, Bantan, and Yogyakarta, where women play key roles as business managers, tourism promoters, and preservationists ([Sirad et al., 2025](#)). (Page 10, Line: 343-354).*

# Reviewer # 3

## Response to Reviewer X Comments

### 1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation	Reviewer's Evaluation	Response and Revisions
Does the introduction provide sufficient background and include all relevant references?	Yes	
Is the research design appropriate?	Yes	
Are the methods adequately described?	Yes	
Are the results clearly presented?	Can be improved	The result has been improved and redesign
Are the conclusions supported by the results?	Can be improved	The conclusion has been improved as response below
Are all figures and tables clear and well-presented?	Yes	

### 3. Point-by-point response to Comments and Suggestions for Authors Comments 1:

This study is important, not only in terms of the subject it addresses, but also in terms of the methodology it uses to demonstrate what it set out to achieve.

In my opinion, I believe that the final part of the title would be more explicit if it were... *Concept in Est Sumba (Indonesia)* – I leave this suggestion.

#### Response 1:

Dear Professor.

Thank you for your opinion.

We have made several revisions in accordance with the detailed suggestions you provided.

#### Comments 2:

The section on the subject's context is well structured. However, it could have been better consolidated, namely by presenting other studies or case studies that illustrate the

methodology applied here

**Response 3:**

Dear Professor,

Thank you for pointing out. We have presented previous research examining the methodologies we use, including:

*Development of a tourism sustainability assessment procedure: a conceptual approach (Ko, 2005); Sustainability Indicators Measuring the Immeasurable? ((Bell & Morse, 1999). A quantitative method for description and assessment of ecosystems: The AMOEBA-approach (Ten et al., 1991). (Page 6, Line 236-243).*

Several case studies on tourism management that use indicators consistent with our research are described in the introduction.

*Previous research has examined women's empowerment in CBT (McCall et al., 2021; Idris et al., 2021; El-Manhaly & Taha, 2024), pro-poor tourism (Yang et al., 2021), and archipelago-based tourism (Lewis-Cameron & Williams, 2022; Figueroa & Rotarou, 2021; Hsiao et al., 2021) in fragmented approaches. (Line 187-190)*

**Comments 3:**

In terms of conclusions, in addition to what was identified by the study, it was important to know HOW? How and in what way can the results identified by the study be achieved? To this end, something more economic could have been presented, in response to the journal to which the paper was submitted.

**Response 3:**

Dear Professor,

Thank you for pointing out.

The Conclusion section presents several recommendations as implications for resolving the issues presented in the introduction.

*This study offers several recommendations for women's empowerment in CBT across the archipelago. The implication of this research is to provide a broader understanding for various stakeholders, especially women, thereby increasing their involvement in the tourism industry. The active participation of women in the tourism business specifically increases family economic independence and, more generally, influences the financial movement of local communities in East Sumba Regency. Family economic independence in the short- and medium-term can significantly reduce stunting rates. (Line 675-675).*

The study presents various reviews of the economy as the main impact of women's empowerment. The interpretation of the research results, which emphasises the study of economic aspects, is narrated in two subchapters, namely:

4.4. Sustainable Tourism in East Sumba Archipelago through Women's Empowerment (Page 15).

4.5. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago (Page 15).

**Comments 4:**

Of the 94 sources referenced in the bibliography, only 34% are articles from the last 5 years;

**Response 4:**

Dear Professor,

Thank you for pointing out.

The author has reduced the references from 94 to 69 as a result of the introduction redesign. In the bibliography section, the number of references from the last five years is 69% or 47. Several references older than 5 years are still used because they provide crucial theoretical foundations and are cited in the methodology section, including:

1. Bell, S., & Morse. (1999). *Sustainability Indicators: Measuring the Immeasurable*. London: Earthscan. Available online: [https://www.u-cursos.cl/ciencias/2015/2/CS06067/1/material\\_docente/bajar?id\\_material=1210909](https://www.u-cursos.cl/ciencias/2015/2/CS06067/1/material_docente/bajar?id_material=1210909) [accessed on 4 September 2025]. (Line 713)
2. Ko, T. G. (2005). *Development of a Tourism Sustainability Assessment Procedure: A Conceptual Approach*. *Tourism Management*, 26(3), 431–445. [CrossRef]. (Line 780)
3. Prescott-Allen, R. (1997). *Barometer of Sustainability*. *Political Science*, May 1997. Available online: [https://www.academia.edu/64347879/Barometer\\_of\\_sustainability\\_measuring\\_and\\_communicating\\_welbeing\\_and\\_sustainable\\_development](https://www.academia.edu/64347879/Barometer_of_sustainability_measuring_and_communicating_welbeing_and_sustainable_development) [accessed on 1 September 2025] (Line 804)
4. Ten, B., Hosper, S., & Colijn, F. (1991). *A quantitative method for description and assessment of ecosystems: The AMOEBA-approach*. *Marine Pollution Bulletin*, 23, 265–270. Available online: <https://digitallibrary.un.org/record/109294%0D%0A%0D%0A>. [accessed on 1 September 2025] (Line 827)

#### **Comments 5:**

Sources referenced but not included in the bibliography: Carvalho, 2018 (line 197)/Choi, 2010 (line 262)/ Junaid et al., 2021(line 278).

#### **Response 5:**

Dear Professor,

Thank you for pointing out.

We have updated the reference list and citations in the manuscript. We have removed the references to Carvalho (2018 & Choi (2010) and added the reference to Junaid et al. (2021 to the bibliography. (Line 774)

#### **Comments 6:**

Sources incorrectly placed in the bibliography: Hizmi & Junaid, 2023 (line 277)/ Murillo & Orozco, 2006).

#### **Response 6:**

Dear Professor,

We have corrected the reference layout in accordance with the provisions. (Page 17).

#### **Comments 7:**

There is a wide range of bibliography on the issue of Social Responsibility and Poverty, with some of the authors being well known in the field, such as Ashley, Caroline and Goodwin, Harold, among many others.

#### **Response 7:**

Dear Professor,

We have updated the references by removing several older references and replacing them with relatively new ones, namely:

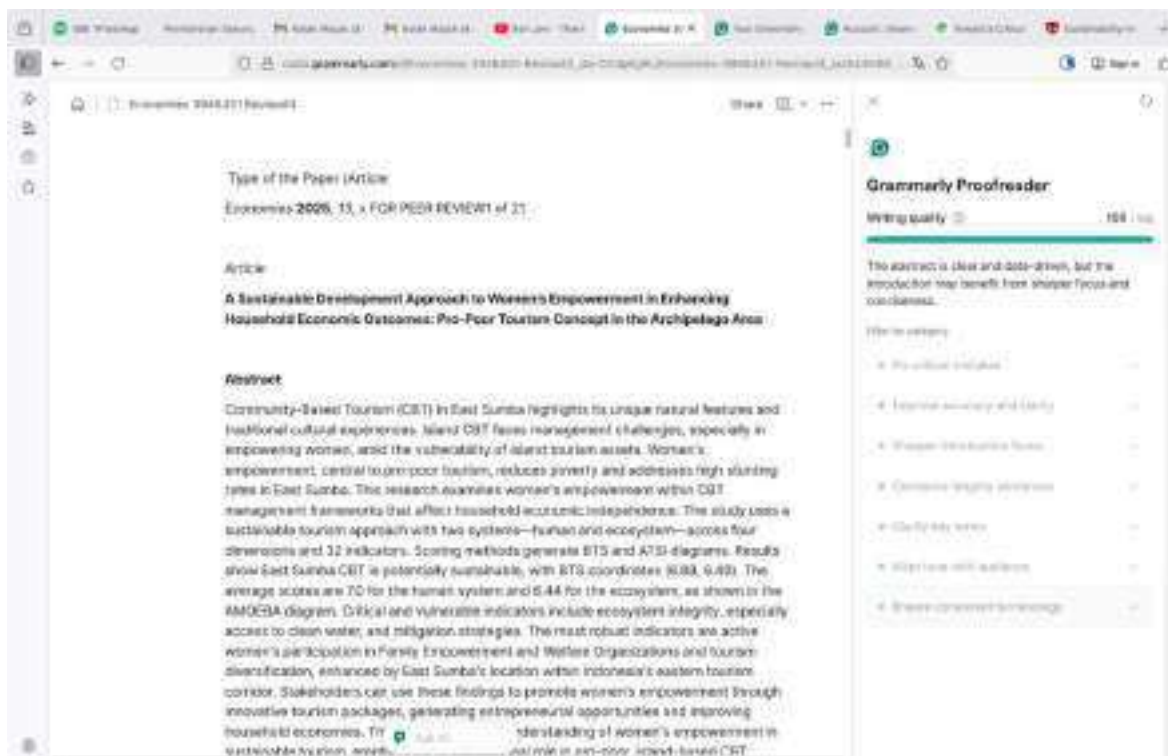
- Cao, W., Zhou, Y., Li, R., Xuecao Li, X., Zhang, H. (2021). Monitoring long-term annual urban expansion (1986–2017) in the largest archipelago of China. *Science of the Total Environment*, 776, 146015. [CrossRef]
- Çolak, O., Kiper, V.O., & Kingir, S. (2023). Engaging poverty with tourism: Pro-poor tourism perspective. *Journal of multidisciplinary academic tourism*, 8 (1), 93-100. [CrossRef]
- Hazenberg, R., Phuong, B.L.A., & Tran, T.M.L. (2025). Pro-Poor Tourism as a Mechanism of Social Innovation and Empowerment. *EAI Endorsed Transactions on Tourism, Technology and Intelligence*, 2(1), 1-7. [CrossRef]
- Nashrullah., Paturusi, S.A., Adikampana, I.M., & Anom, I.P. (2025). Unveiling Tourism Management Reality in the Tanakeke Archipelago: The Symbiosis of Biophysical Potential, Sociocultural Capital, and Stakeholder Constellations. *Asian Journal of Management Entrepreneurship and Social Science*, 5(3), 1158-1184. [CrossRef]
- Sirad, D.A., Widiastini, N.M.A., & Karta, N.L.P.A. (2025). Empowering Women in Indonesia's Tourism Villages: The Role of MSMEs in Economic Development. *Journal of Social and Humanities*, 15(1), 1-9. [CrossRef]
- Wen, S., Cai, X., & Justin. (2021). Pro-Poor Tourism and Local Practices: An Empirical Study of an Autonomous County in China. *SAGE Open*, 11(2), 1-11. [CrossRef]
- Wu, C.S., Tan, Z.S., Lee, I.T., Hoa, S.X., & Fordham, G.G. (2023). Corporate Social Responsibility in Sustainable Tourism Development towards Local Culture. *Sosateris*, 11(2). [CrossRef]

#### 4. Response to Comments on the Quality of English Language

Dear Professor,

Thank you for your advice on the quality of our English.

We have proofread manually and used the paid Grammarly Pro tool. The results of our proofreading are presented in the screenshot below.





# A Sustainable Development Approach to Women's Empowerment in Increasing Household Economic: Pro-Poor Tourism Concept in the Archipelago Area

## Abstract

Community-Based Tourism (CBT) in East Sumba highlights its unique natural features through its archipelagic potential, which is synergistically integrated with rich traditional cultural experiences. Island-based CBT faces strategic management challenges, especially in empowering human resources, notably women, amid the inherently vulnerable and fragile nature of island tourism assets. Women's empowerment, a key element of pro-poor tourism, significantly influences poverty reduction and helps address the high rates of stunting in East Sumba. This research aims to examine women's empowerment within archipelago-based CBT management frameworks that impact household economic independence. The study adopts a sustainable tourism approach that involves two systems—the human system and the ecosystem—broken down into four dimensions and 32 indicators to assess the sustainability potential of each. Data analysis uses scoring methods to produce BTS and ATSI diagrams. Findings indicate that East Sumba CBT falls within the potentially sustainable quadrant on the BTS diagram, with coordinates (6.88, 6.49). The average scores are 7.0 for the human system and 6.44 for the ecosystem, supported by the AMOEBA diagram, which shows broad tendencies. The most critical and vulnerable sustainability indicators include ecosystem integrity — particularly access to clean water — and effective mitigation strategies. Conversely, the indicators with the highest robustness include active women's participation in Family Empowerment and Welfare Organizations and tourism diversification, which is enhanced by East Sumba's strategic location within Indonesia's eastern tourism corridor. Stakeholders can leverage these findings by promoting women's empowerment through integrated tourism package innovations, thereby creating more entrepreneurial opportunities and improving household economic conditions. This research contributes to understanding women's empowerment through sustainable tourism methods, emphasizing its role as a foundation for pro-poor tourism within island-based CBT frameworks.

**Keywords:** Women's Empowerment; CBT; Pro-Poor Tourism; Archipelago Tourism; Household Economic; Human System; Ecosystem

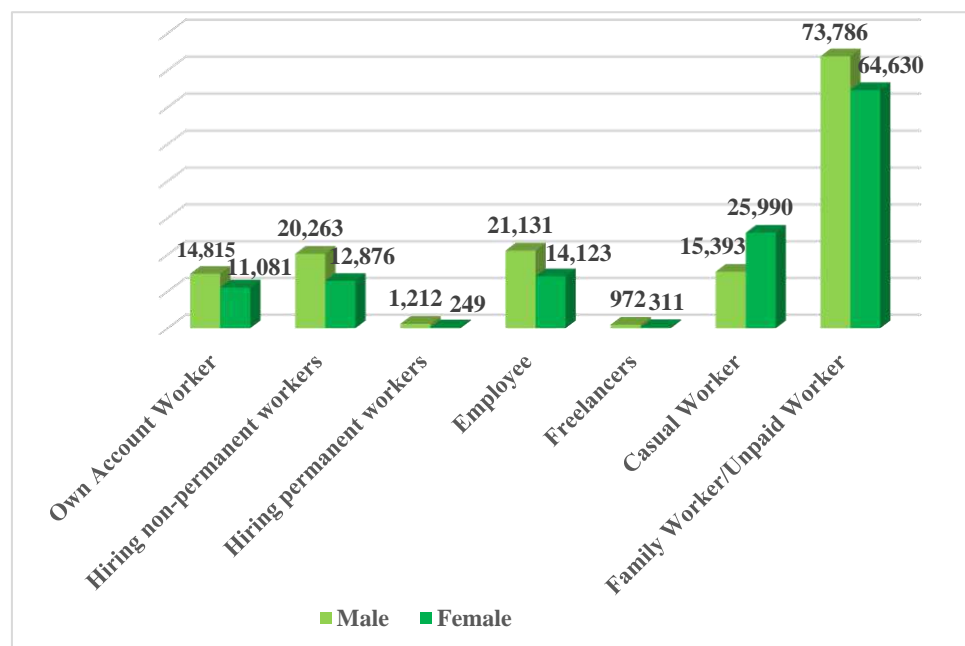
## 1. Introduction

East Sumba is a regency on Sumba Island, East Nusa Tenggara Province, Indonesia. In 2020, East Sumba Regency was classified as a disadvantaged region under Presidential Regulation No. 63 of 2020. Four years later, in 2024, it was successfully ranked as a developing region based on a decrease in the poverty rate, one of the critical indicators. According to data from the [Central Statistics Agency of East Sumba \(2025\)](#), the poverty rates for 2020, 2021, 2022, and 2023 were 29.65%, 29.68%, 28.22%, and 28.08%, respectively. Beyond these socioeconomic shifts, archipelagic destinations have unique opportunities to develop a strong identity and become resilient in the face of future crises ([Figueroa & Rotarou, 2021](#)). East Sumba Island, with its unique cultural heritage, is a golden ticket to develop it as a tourist destination to boost the economy and reduce poverty. This potential is further highlighted by the regency's growing tourist appeal, as evident in the increase in foreign and domestic tourists from 2021 to 2023. The number of international tourist visits from 2021 to 2023 was 87 (2021), 813 (2022), and 2,121 (2023). Meanwhile, the number of domestic tourist visits was 18,489 (2021), 34,083 (2022), and 50,635 (2023).

The management of island-based tourism potential faces several obstacles, including inadequate infrastructure, limited human resource capacity, weak planning, low local community participation, and a lack of collaboration ([Nashrullah et al., 2025](#)). Island tourism plays a vital role in maritime economic development ([Mo & Qi, 2023](#)), thereby requiring strategies to enhance competitiveness by empowering local communities. Developing sustainable ecotourism service systems is essential for islands that are more vulnerable and easily affected ([Hsiao et al., 2021](#)). The key component of marine ecotourism service systems is management capacity for mitigation, with ecological diversity serving as a core resource. Local communities work with stakeholders to build ecotourism systems that support conservation sustainability and increase tourist satisfaction ([Hsiao et al., 2021](#)). Management of the island focuses on personalized, nature-based experiences to promote sustainable tourism that benefits the local community economy ([Figueroa & Rotarou, 2021](#)). Sustainable tourism management requires an inclusive approach to institutional strengthening and community empowerment. Strengthening community empowerment involves investing in human resource capacity-building, participatory planning, and collaboration among tourism stakeholders to support long-term community welfare ([Nashrullah et al., 2025](#)). Efforts to promote sustainable island tourism often focus on cultural enhancement to attract visitors ([Ge, 2020](#)).

Managing island tourism through local community empowerment is a concept of pro-poor tourism (PPT) ([Yang et al., 2021](#)). PPT has developed since the early 2000s as a concept of sustainable tourism development through local community empowerment. Sustainable island tourism management can drive economic and social transformation ([Cao et al., 2021](#)). PPT can reduce poverty ([Çolak et al., 2023](#)) and have an impact on the environment and society through cooperation between various stakeholders ([Wen et al., 2021](#)). The implementation of PPT without involving the business sector has led to ineffectiveness, stagnation, and the failure of tourism businesses. CSR programmes are one form of collaboration to realise PPT. CSR programmes can harmonise cultural preservation and economic interests to realise sustainable tourism through various innovative initiatives ([Wu et al., 2023](#)). The PPT programme is implemented through a social innovation approach and the strengthening of traditions to encourage the transformation of community power structures ([Hazenbergh et al., 2025](#)). Based on East Sumba statistics for 2024, women's empowerment remains comparatively limited. The majority of women in East Sumba are homemakers without income-generating activities (family workers or unpaid laborers), totaling 64,630, due to restricted opportunities for active participation in industrial sectors ([Central Statistics Agency of East Sumba, 2025](#)).

This data demonstrates that most women remain unproductive and unable to contribute to the family's economic reinforcement. Productive-age population statistics are presented in Figure 1.



**Figure 1.** Population 15 Years and Over who Worked During the Previous Week by Main Employment Status and Sex in East Sumba Regency, 2023. Source: East Sumba regency in Figures 2024

Women's empowerment in East Sumba remains relatively limited due to two main factors: patriarchal norms and educational levels. In some aspects of social life in East Sumba, men still serve as the primary decision-makers in families and communities across various areas of life. Meanwhile, women are seen as holding subordinate roles and are more vulnerable to different forms of violence. Educational attainment in East Sumba is mainly at the primary school level. In 2022 and 2023, it was reported that over 98% of individuals had completed primary education ([Central Statistics Agency of East Sumba, 2025](#)). Women's empowerment in East Sumba aims to improve family welfare, thereby helping lower the persistently high stunting rates, which averaged 15% from 2021 to 2024 ([Central Statistics Agency of East Nusa Tenggara Province, 2025](#)). This rate exceeds the government target of below 14%. Women's empowerment through pro-poor tourism management grounded in archipelagic traits is a strategic option for boosting family economics and overall societal conditions.

Sustainable tourism promotes equitable tourism by empowering women in many domains ([Jamal & Higham, 2021](#)). Eco-feminist paradigms for eco-cultural justice ([Camargo et al., 2016](#)) and feminist epistemological views ([Eger et al., 2022](#)) also support women's empowerment. Women's empowerment is key to successful tourism development and to long-term poverty reduction. Examples include Balinese women in indigenous communities. They actively participate in tourism, supporting family resilience while still fulfilling family duties ([Adnyani & Purnamawati, 2024](#)). Gender inequality has become a global concern, acting as a barrier to women's empowerment in tourism development. Women are more likely to have insecure jobs, earn less, and have fewer career opportunities ([Nanthini & Nair, 2020](#)). Gender inequality began with physical differences; however, it evolved due to social, historical, and cultural factors ([Jule, 2014](#)), such as patriarchal restrictions for Arab women ([Zuhur, 2003](#)) and Confucian

traditions in China (Hao et al., 2021). Gender inequalities block truly sustainable human development, and understanding gender in local contexts is needed. Achieving gender equality helps business development, service quality, and customer satisfaction (Wan & Chan, 2018). Women's empowerment can help reduce vulnerability and boost resilience and sustainability in the face of global climate and pandemic crises (Kalisch & Cole, 2023).

Sustainable tourism management through the concept of empowerment involves two systems as key indicators, namely the human system and the ecosystem (Ko, 2005). Human system indicators include politics, economics, socio-culture, and production structures, while ecosystem indicators include environmental impact, ecosystem quality, biodiversity, and environmental policy and management. The presence of women within the human system plays an essential role in realising sustainable tourism. The tourism industry offers opportunities for women to take on roles within organizational hierarchies (Vujko et al, 2024), contribute innovative ideas or frameworks (McCall et al., 2021), and participate in tourism development planning (Rahmawati & Darwis, 2023). Women's active involvement in tourism-related organizations mainly remains limited to women's groups, such as Family Empowerment and Welfare (Wirdawati et al., 2024).

The achievement of sustainable tourism is shown through economic impacts, especially the creation of entrepreneurial opportunities and the growth of local community economies. Women's empowerment is realized through active involvement in various tourism businesses (McCall et al., 2021), opening doors to start independent businesses (Wardhani & Susilowati, 2021), which in turn leads to increased income (Idris et al., 2023; Vukovic et al., 2023), supporting household economic independence (Borovic et al., 2022). From a social perspective, sustainable tourism creates opportunities for women to participate socially through various tourism industries (Rahmawati & Darwis, 2023). Active involvement in tourism boosts women's self-confidence (Hao et al., 2021), promotes gender equality (Ghimire et al., 2024), raises awareness of the importance of self-development and future generations (Pécot et al., 2024), and fosters increased pride (Rasoolimanesh et al., 2017). Sustainable tourism promotes optimal tourist satisfaction through strengthening service and product quality standards. Tourist experiences are shaped by complex interactions that can encourage tourists to revisit destinations. Sustainable tourism can package products from environmentally sustainable raw materials, promote environmental and cultural conservation through infrastructure development (El-Manhaly & Taha, 2024), and build on adequate skills and knowledge from local communities (Pécot et al., 2024).

Tourism management produces both positive and negative effects (Butler et al., 2022). The positive aspects of tourism businesses include raising awareness of the importance of protecting the environment and culture. On the other hand, long-term adverse effects can consist of conflicts among local communities (Simpson, 2008), increased waste, and traffic congestion (Pearce & Chen, 2012). Sustainable tourism should create healthy ecosystems, including sufficient water resources, suitable land for tourism activities, and clean air (Yin et al., 2022), as well as the adoption of tourism mitigation strategies (Afifa & Nugroho, 2022). Sustainable tourism is closely linked to tourism diversification (O'Halloran, 2020), which includes traditional cultural uniqueness, handcrafted crafts and culinary arts, and natural attractions found on islands (Mrd-a & Caric, 2019). Sustainable tourism involves establishing strong institutions that operate efficiently, uphold development programs and policies regulating tourism growth, and foster effective collaboration with various stakeholders (Kapera, 2018).

The Global Sustainable Tourism Development Council (GSTC) states that sustainable tourism applies four pillars: environmental, economic, social, cultural, and management. Implementing these four pillars benefits local communities and improves destination quality (Borland & Lindgreen, 2013). The conceptualization of sustainable tourism

through four pillars is realized through stakeholder synchronization and training programs (Hizmi & Junaid, 2023), which are key to successful sustainable development (Junaid et al., 2021). Tourism environment, as the foundation of sustainable tourism development, encompasses the natural, economic, and social and cultural environments (Ge, 2020). Sustainable tourism development influences environmental conservation, economic development, and social progress (Hernández-Cuevas,2024).

This research examines women's empowerment in island-based CBT located in East Sumba Regency, East Nusa Tenggara. Archipelago tourism has characteristics distinct from those of urban or rural tourism and is more vulnerable to environmental degradation. The findings offer an overview of current conditions related to women's empowerment through CBT management, which influences family economic improvement. CBT, as a model of sustainable tourism, plays a crucial role for both impoverished and non-impoverished households and helps reduce poverty by empowering communities through tourism enterprises (Thomas, 2025). The study provides strategic recommendations for reducing poverty through women's empowerment in tourism businesses, supporting household economic growth and independence. The implications include reconceptualizing women's empowerment in light of the study's findings. The research adds new insights by focusing on women's empowerment in island-based tourism areas to help reduce poverty and promote sustainable tourism goals.

Previous research has examined women's empowerment in CBT (McCall et al., 2021; Idris et al., 2021; El-Manhaly & Taha, 2024), pro-poor tourism (Yang et al., 2021), and archipelago-based tourism (Lewis-Cameron & Williams, 2022; Figueroa & Rotarou, 2021; Hsiao et al., 2021) in fragmented approaches. This research integrates three tourism management variables assessed using a sustainable tourism methodology—first, women's empowerment as SDG 5: Gender Equality. Second, archipelagic regions are key components of marine tourism, serving as primary attractions in Indonesia, as an archipelagic nation. Island tourism offers unique potential but also involves fragile and easily compromised characteristics, which require effective and efficient management strategies—third, pro-poor tourism as SDG 1: No Poverty. Strategies for poverty alleviation are a strategic concern in eastern Indonesian regions, including East Nusa Tenggara.

## 2. Methodology

### 2.1 Research Design

The research design adopts a descriptive quantitative methodology with a focus on sustainable tourism. The quantitative approach is used to measure indicators of sustainable tourism assessment, covering two systems: the Human System and the Ecosystem. Primary data is collected through observation and interviews to determine scores, while secondary data is obtained from third-party sources, both online and offline. Primary data was collected through Focus Group Discussion (FGD) using survey and interview methods from June to August 2025. The FGD was conducted with approval from the East Sumba Regency Government, dated June 10, 2025, which authorized the Tourism and Culture Office to facilitate the availability of key respondents and informants for data collection. Participants in primary data collection include women involved in tourism management, tourism village managers, tourism awareness groups, village officials, and other relevant stakeholders. Secondary data from third parties was obtained from the tourism office, the central statistics agency, and stakeholders involved in CBT management, including CBT management documents, tourism development programmes, and related data. Secondary data was collected over a period of five months, from April to August 2025. The study was carried out in eight tourism villages in East

Sumba, located from east to southeast: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Lambanapu, and Prailiu. Village selection was based on their characteristics as cultural tourism sites with significant potential for women's empowerment. The village groups involved in the research are referred to as society.

## 2.2. Data Analysis Techniques

The data analysis technique employs the Barometer of Tourism Sustainability (BTS) and AMOEBA of Tourism Sustainability Indicators (ATSI) methodologies. BTS elucidates the comprehensive sustainability level of human systems and ecosystems (Prescott-Allen, 1997). The sustainability barometer presents a systematic approach to measuring and communicating community welfare and progress toward sustainable development, producing conclusions about human systems and ecosystem conditions, and the effects of human interaction with ecosystems. The BTS methodology provides researchers with the opportunity to select their own indicators to measure humans and ecosystems as an integrated system and to assess the entire system and its components (Guijt et al., 2001). The system barometer presents the sustainability of tourism management in five ratings. These ratings are measured on a score range: Unsustainable Tourism ( $0 \geq X > 2$ ), Potentially Unsustainable Tourism ( $2 \geq X > 4$ ), Intermediate ( $4 \geq X > 6$ ), Potentially Sustainable Tourism ( $6 \geq X > 8$ ), and Sustainable Tourism ( $8 \geq X \leq 10$ ). The barometer also presents the coordinates of measurement results for 32 indicators that describe the sustainability status of tourism management. AMOEBA of Tourism Sustainability Indicators (ATSI) explains the sustainability level of these tourism indicators (Bell & Morse, 1999; Ten et al., 1991). ATSI is the result of measurements from 32 indicators. It is presented in the AMOEBA visualisation, which illustrates the level of sustainability: the wider the AMOEBA, the stronger the sustainability. The ATSI visualisation design uses a radar chart in Excel.

BTS and ATSI analysis techniques provide a visual overview of the sustainability conditions of tourism management in a geographical area (Ko, 2005). The BTS and ATSI analysis stages comprise several phases: determining the community; identifying the system, dimensions, and indicators; determining the indicator weights and scales; calculating indicator scores; and presenting the results in visual form. The research employs 32 indicators to measure tourism sustainability, referred to as Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1-2 are assessed as highly unsustainable, ratings 2-4 are evaluated as less sustainable, rating 5 is estimated as neutral, ratings 6-7 are evaluated as potentially sustainable, and ratings 8-10 are assessed as highly sustainable (Sugiyono, 2020). Each indicator is assigned a weighting based on its contribution to the system being measured. The measurement results from 32 indicators, obtained through the rating process, are entered into a table and multiplied by their respective weights to produce a score. The total score for each system produces coordinates that are presented on the Barometer graph, while the rating values are presented in the AMOEBA visualisation. Research indicators are formulated based on relevant theoretical foundations, as presented in Table 1.

Table 1. Sustainable Indicator (SI).

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Traditional Villages in East Sumba: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Prailiu, Lambanapu		
System	Dimension	Indicators
The Human System	Politic	SI1 Women occupy strategic positions in organizational management ( <a href="#">Vujko et al., 2024</a> )
		SI2 Women have opportunities to express their opinions ( <a href="#">Mc Call &amp; Mearns, 2021</a> )
		SI3 Women participate in tourism development planning ( <a href="#">Rahmawati &amp; Darwis, 2023</a> )
		SI4 Women develop women's institutions, such as the Family Welfare Movement ( <a href="#">Wirdawati et al., 2024</a> )
	Economic	SI5 Women are actively involved in various tourism business sectors ( <a href="#">El-Manhaly &amp; Taha, 2024</a> )
		SI6 Women have opportunities to establish independent businesses in the tourism sector ( <a href="#">Wardhani &amp; Susilowati, 2021</a> )
		SI7 Women generate income from tourism to strengthen the economy ( <a href="#">Borovic' et al., 2022</a> )
		SI8 Women experience increased economic independence ( <a href="#">Rahmawati &amp; Darwis, 2023</a> )
	Social Dimension	SI9 Women gain self-confidence through tourism involvement ( <a href="#">Vujko et al., 2024</a> )
		SI10 Women have opportunities to socialize through tourism businesses ( <a href="#">El-Manhaly &amp; Taha, 2024</a> )
		SI11 Women achieve gender equality through the tourism business ( <a href="#">Ghimire et al., 2024</a> )
		SI12 Women possess awareness for self-development and future generations ( <a href="#">Pécot et al., 2024</a> )
	Production Structure	SI13 Women process environmentally friendly raw materials ( <a href="#">El-Manhaly &amp; Taha, 2024</a> )
		SI14 Women play active roles in environmental and cultural conservation ( <a href="#">Butler et al., 2022</a> )
		SI15 Women are actively involved in local infrastructure management ( <a href="#">El-Manhaly &amp; Taha, 2024</a> )
		SI16 Women possess adequate skills and knowledge ( <a href="#">Wirdawati et al., 2024</a> )
The Ecosystem	Environmental Impacts ( <a href="#">Butler et al., 2022</a> )	SI17 Fostering awareness to participate in environmental conservation actively
		SI18 Long-term activities impact population density and congestion.
		SI19 Tourism activities potentially generate waste from tourism-related activities.
		SI20 Tourism management potentially triggers conflicts among local communities.
	Ecosystem Quality ( <a href="#">Yin et al., 2022</a> )	SI21 Community-Based Tourism (CBT) has adequate water resources
		SI22 CBT has adequate and representative land for the tourism business
		SI23 CBT maintains clean air quality that poses no risk to human health
		SI24 CBT implements tourism mitigation programs
	Tourism diversity ( <a href="#">Afifa &amp; Nugroho, 2022</a> )	SI25 CBT possesses a unique traditional culture
		SI26 CBT produces distinctive handicrafts
		SI27 CBT offers distinctive cuisine
		SI28 CBT features natural beauty based on archipelagic characteristics
Enviromental Policy & Management ( <a href="#">Kapera, 2018</a> )	SI29 CBT maintains healthy governance and executes its functions and responsibilities	
	SI30 CBT implements sustainable tourism development programs	
	SI31 CBT establishes policies that regulate development	
	SI32 CBT maintains extensive cooperation with various stakeholders	

Source: developed from Ko (2005).

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### 3. Results

#### 3.1. General Overview of CBT in East Sumba

The research utilizes eight CBTs, including Mondu, Lambanapu, Malumbi, Prailiu, Watuhadang, Rindi, Kaliuda, and Lainjanji. Mondu Village is located in Kanatang District and covers 90.45 km<sup>2</sup>. The tourism potential of Mondu Village includes savanna landscapes, Mangejing ritual culture, Padadita traditional village, Tanggedu waterfall, Kapihak Beach, and a creative economy through weaving, lontar leaf handicrafts, and statue carving. The population of Mondu Village is 1,596, primarily engaged in farming, livestock breeding, and fishing. Lambanapu Village is situated in Kambera District, covering 795 hectares, with a population of 3,191. The area is mainly rice fields and agricultural land, so most residents work in farming. Its tourism attractions include the Kambaniru River, the Lambanapu archaeological site, the cultural house, weaving, the Tanau and Seribu hills, the Ori Angu Dance Studio, and the Li Luri Studio. Both Mondu and Lambanapu villages are vulnerable to flood disasters. Malumbi Village, located in East Wewewa District, spans 11.2 km<sup>2</sup> with 2,467 residents, mostly farmers and artisans. Its tourism potential includes the Kambaniru River and Dam, herbal hills, weaving, betel nut processing sites, and bamboo crafts. Prailiu Village is in Kahaungu Eti District, covering 51 hectares and home to 7,874 residents who work as farmers and artisans. Attractions include Prailiu Village, Hamayang (Traditional Ritual), Parunggara tour (Guest Welcome), Hambu marata (bride welcomed in the village of origin), Puru la kamaidu (harvest ceremony), Palupang Djara (Horse Racing), megalithic stones, mangrove tourism, Batu Payung Beach, traditional dance, ikat weaving crafts, and specialty foods like Manggulu, kaparak, instant ginger beverages, and moringa biscuits. Watuhadang Village, in Umalulu District, covers 1,020 hectares and has 2,954 residents engaged in farming, livestock breeding, and weaving. Its tourism potential includes traditional villages, megalithic graves, traditional houses, pahikung weaving, savanna hills, and the kendingan dance. Watuhadang is relatively safe from natural disasters. Rindi Village, in Rindi District, covers 57 km<sup>2</sup> and has 1,702 residents, mainly farmers, livestock breeders, and fishermen. Its attractions consist of noble graves, the tarik bati tradition, the Praiyawang traditional village, and stone carving crafts. The town faces risks from floods and storms. Kaliuda Village, in Pahunga Lodu District, spans 110 hectares and is home to 4,238 residents engaged in farming, fishing, livestock breeding, and artisan work. Its tourism appeals include ancestral culture on woven fabrics and Prieau customs, Marapu traditional funeral rituals, megalithic graves, weaving crafts, seaweed farming, the Nalu and Kanggoa Rivers, the Prieau traditional village, Tandening savanna grassland (the longest savanna), and traditional dance. Kaliuda is vulnerable to natural hazards, including floods, tsunamis, and earthquakes. Lainjanji Village, in Wulla Waijilu District, covers 97.2 km<sup>2</sup> with 1,500 residents, who mainly work as farmers, plantation workers, and fishermen. The area's attractions include coastal flows and savanna grasslands. The tourism potential consists of the Lainjanji River, Woranu River, Praibakal River, Watuparunu Beach, hot springs, ikat weaving, and seaweed farming.

The selection of eight CBTs was based on regional characteristics and potential, specifically traditional cultural assets, weaving crafts, and natural resources from the archipelago. Villages known for weaving have significant potential to empower women because most weaving artisans are women. These eight CBTs pose challenges to women's empowerment in tourism management, potentially affecting their families' economic independence. Based on data collected through observation, interviews, and documentation, the assessments of 32 indicators are shown in Table 2.

Table 2. Sustainable Indicator (SI) Assessment.

System	Dimension	Indicator Weight	Rating Score	System	Dimension	Indicator Weight	Rating Score
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(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)		
The Human System	Politic	SI1	0.08	6,00	0.50	The Ecosystem	Environmental Impacts	SI17	0.07	7,00	0.51		
		SI2	0.06	8,00	0.44			SI18	0.02	4,00	0.10		
		SI3	0.06	6,00	0.33			SI19	0.07	6,00	0.44		
		SI4	0.03	9,00	0.25			SI20	0.05	6,00	0.29		
	Economic	SI5	0.08	7,00	0.58		Ecosystem Quality	SI21	0.07	4,00	0.29		
		SI6	0.03	7,00	0.19			SI22	0.07	6,00	0.44		
		SI7	0.08	6,00	0.50			SI23	0.05	7,00	0.34		
		SI8	0.08	6,00	0.50			SI24	0.07	4,00	0.29		
	Social	SI9	0.06	7,00	0.39		Tourism diversity	SI25	0.07	9,00	0.66		
		SI10	0.06	8,00	0.44			SI26	0.07	9,00	0.66		
		SI11	0.08	8,00	0.67			SI27	0.07	6,00	0.44		
		SI12	0.06	7,00	0.39			SI28	0.05	9,00	0.44		
	Production Structure	SI13	0.08	8,00	0.67		Environmental Policy and Management	SI29	0.07	6,00	0.44		
		SI14	0.06	8,00	0.44			SI30	0.05	6,00	0.29		
		SI15	0.03	5,00	0.14			SI31	0.05	7,00	0.34		
		SI16	0.07	6,00	0.44			SI32	0.07	7,00	0.51		
					$\bar{x}=7$	<b>6.88</b>						$\bar{y}=6.44$	<b>6.49</b>

Source: Authors (2025).

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Table 2 shows the results of sustainable tourism measurements using human systems and ecosystems, covering eight subsystems. The rating value presents measurement results for 32 weighted indicators. The score is calculated by multiplying the weighted value by the rating value. In Table 2, column 1 lists a rating of 6 for the sustainable indicator (SII). The score of 0.5 is the product of the weighted value and the rating value. The total indicator score for the human system is the X-coordinate value. The total score for the ecosystem indicator is the Y-coordinate value, representing the sustainable condition in the Barometer graph. The rating value also shows the sustainable condition for each indicator, as presented in the AMOEBA visualisation.

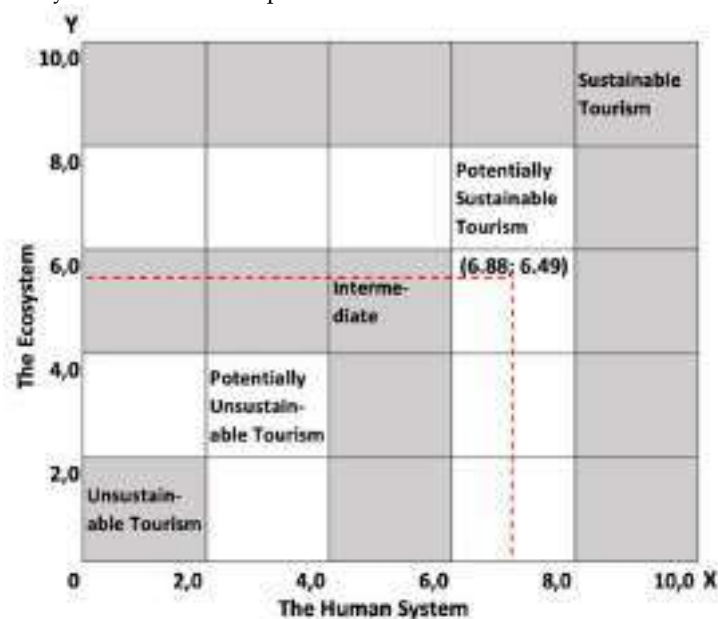
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### 3.2. Barometer of Tourism Sustainability (BTS)

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Based on scoring values in Table 2, the axis value (X; Y) is (6.88; 6.49), which is in the potentially sustainable quadrant, as shown in Figure 2. This quadrant highlights opportunities for sustainable CBT tourism in East Sumba, emphasizing the balance between the Human System and Ecosystem with tourism pentahelix involvement.

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Figure 2. Barometer of Tourism Sustainability (BTS). Source: Authors (2025)

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3.3. AMOEBA of Tourism Sustainability Indicator (ATSI)

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Based on Table 2, the AMOEBA diagram in Figure 3 illustrates the level of tourism sustainability in East Sumba.

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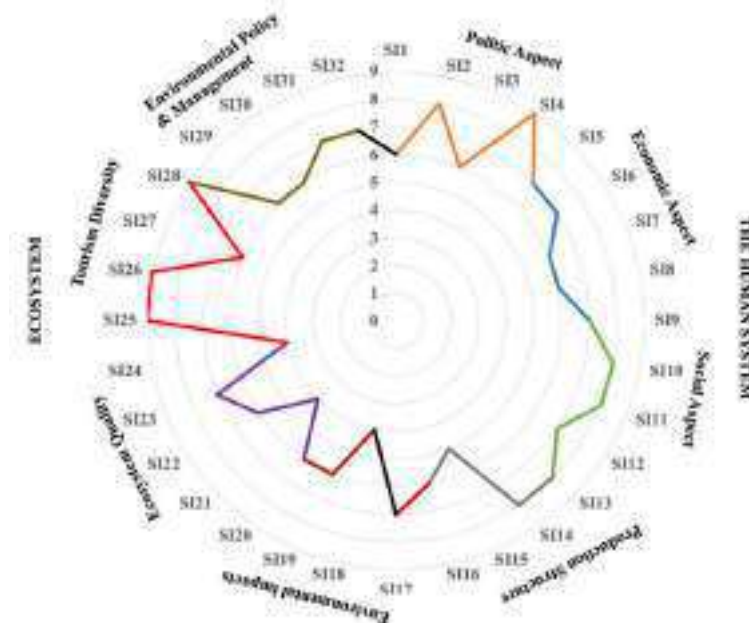


Figure 3. AMMOEBA of Tourism Sustainability Indicator (ATSI). Source: Authors (2025)

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The AMOEBA figure indicates potentially sustainable tourism development on East Sumba Island by its broad coverage. The extent of pseudopodia reflects the magnitude of indicator values: the wider the reach, the higher the value

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4. Discussion

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4.1. Sustainability Level of The Human System in East Sumba Tourism

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The human system in sustainable tourism comprises political, economic, social, and production dimensions. Table 2 shows that the average human system assessment is 7, indicating potentially sustainable conditions. However, the women's empowerment indicator in local infrastructure management (SI15) shows relatively low scores of 5. Women's involvement can be improved by making homestay management a central accommodation for CBT. Most CBTs have not provided homestays due to limited staff knowledge and skills, instead renting parts of residents' rooms for tourists. Existing homestays operate independently from residents' houses, resulting in little interaction between tourists and hosts (Wijayanti & Dewi, 2023). Women's empowerment has reached relatively optimal levels in several tourist destinations, such as Bali, Banyuwangi, Bantan, and Yogyakarta, where women play key roles as business managers, tourism promoters, and preservationists (Sirad et al., 2025).

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The political aspect is assessed through women's participation in institutions directly and indirectly linked to the tourism industry. As seen in Table 2, the highest rating indicator is 9, indicating that women in East Sumba run an organizational forum through community-based groups focused on family empowerment, specifically the Family Welfare Movement (S14) (Wirdawati et al., 2024). However, women's involvement in tourism-related organizations remains limited, especially in Tourism Awareness Groups and Tourism Village Management bodies. The hierarchy within tourism organizations remains male-dominated, limiting women's roles in planning. Although women have opportunities to share their ideas and opinions verbally and in writing about tourism development (McCall et al., 2021), the management process from planning to oversight is

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mainly carried out by men. Women's active participation in East Sumba's tourism growth primarily focuses on tourism business activities, particularly in culinary services, the creative economy, and cultural preservation.

The dimensional indicator measurements shown in Table 2 indicate that while women's empowerment in the tourism industry has reached a sustainable level, its positive impact on economic growth remains limited. This limited impact is partly due to the lack of coordinated and comprehensive support. As a result, women's empowerment efforts remain scattered and do not effectively drive long-term economic development or sustainability. For example, although weaving is a common form of women's empowerment in East Sumba's CBT, the lack of integration across the production and marketing phases limits weavers' ability to increase their income and contribute to broader economic resilience.

Tourism development in East Sumba aims to drive economic growth and improve families' financial independence by empowering women. Women's participation is expected to stimulate tourism growth across the region. As of 2024, 64,630 women in East Sumba are housewives without income—51.94% of the female population and 25.29% of the total population. Women's involvement primarily remains in small-scale operations, with limited roles in starting independent enterprises, which is the main barrier to strengthening the family economy (Borovic et al., 2022).

Culinary attractions in East Sumba remain limited in both quantity and quality. The variety of cuisine offered lacks diversity and is presented simply with insufficient representation. Residents produce cuisine in relatively small amounts due to limited market access. Specialty dishes are not consistently available and are often only made upon request or during tourist visits. East Sumba's specialty dishes include Manggolu (made from kepok bananas and peanuts) and Kaparak (made from corn, rice, and sago). Other culinary options include Woba (seaweed) from Kaliuda Village, lobster from Lainjanji Village, and instant ginger beverages and moringa biscuits from Prailiu Village. Women's empowerment in culinary management can be improved through increased training in culinary skills, packaging, and marketing strategies.

Women's active participation in the creative economy and cultural preservation sectors is clear through handicrafts and traditional dances that attract tourists. East Sumba's notable handicrafts include ikat-woven textiles and pahikung, which vary from village to village. Women play key roles as artisans and keepers of weaving history and cultural traditions. East Sumba includes several weaving artisan communities, such as Karaja Sumba, Praiyawang, Pau, Prailiu, Kanatang, and Kaliuda. East Sumba features various unique traditional dances with significant historical importance, often performed during traditional ceremonies and to welcome distinguished guests. These dances, as part of tourism attractions, are curated to offer compelling experiences for visitors. Some of the preserved dances in East Sumba include Hogor Watang from Kaliuda village, Tebe and Dho'a dances from Lainjanji village, Ori Angum Dance Studio and Li Luri Dance Studio from Lambanapu village, and Kendingan Dance from Watuhadang village.

Integrated tourism package development can serve as a strategy to enhance family livelihoods by empowering women in East Sumba. Tourism packages are designed around various potentials in an integrated, thematic approach, encompassing cultural assets, natural resources, the creative economy, culinary offerings, and other potentials, all managed through women's empowerment. Integrated tourism packages offer substantial opportunities for women to participate actively in tourism enterprises, from planning to monitoring. Women have opportunities to develop thematic tourism packages related to weaving, integrated with other tourism potentials, thereby enabling woven fabric products to achieve higher economic value. Tourists demonstrate willingness to pay premium prices for tourism packages because they not only acquire

woven fabrics as handicraft products but also gain historical and cultural experiences with considerable educational value. Thematic tourism packages stimulate economic acceleration by engaging resources in both quantity and quality, including women. Women serving as weaving artisans fulfill dual roles: producing woven fabric, packaging, and presenting products to tourists.

Women in East Sumba recognize that their empowerment in the tourism industry generates substantial social impacts, such as increased gender equality, confidence, and skills. Survey assessment scores of 7 and 8 in Table 2 reflect these outcomes. Through empowerment, women gain wider access to operational and leadership roles within tourism management, leading to greater representation and influence in decision-making. Their active involvement also raises awareness and promotes the development of new knowledge, benefiting both individuals and the community. As women take on greater responsibility in tourism, they help foster a more inclusive and equitable industry, enabling broader participation and social progress.

The production structure dimension, which encompasses both services and high-quality products, is a key element supporting the sustainability of the tourism area. Service elements are closely connected to human resource capacity as the leading actors in tourism management (Wirdawati et al., 2024). Success in CBT management heavily depends on local human resource capacity since it operates by, from, and for the community. In Table 2, ratings for indicators related to women's involvement in local infrastructure management and to skills and knowledge in the tourism sector remain relatively low. This is supported by East Sumba Regency data from 2024, showing that community education is primarily at the primary school level, accounting for over 98%. Improving human resource capacity is a critical, urgent step toward sustainable tourism. The quality of tourism products depends on effective management systems supported by sufficient infrastructure (El-Manhaly & Taha, 2024). In East Sumba, local infrastructure in tourism areas is still limited in both availability and accessibility. Restroom facilities, which are essential amenities for tourists, are scarce and often in poor condition. Increased involvement from various stakeholders is needed to accelerate the development of tourism infrastructure and enhance human resource capacity. Stakeholder programs related to infrastructure development include CSR efforts from Sarana Multi Infrastruktur (SMI) in partnership with Universitas Bina Sarana Informatika (UBSI). SMI has helped build restrooms, food courts, UV curing equipment for weaving, and water wells in Watuhadang village. At the same time, UBSI has provided training and support to boost human resource capacity.

According to Table 2, women's empowerment receives high ratings in the processing of environmentally sustainable raw materials and in conservation efforts. Women actively participate in cultural conservation by maintaining weaving traditions and preserving traditional dances (Butler et al., 2022). The use of naturally sourced colouring materials for dyeing threads to be woven into fabrics, such as *Morinda citrifolia* roots, indigo leaves, tree bark, and clay, further demonstrates engagement with sustainable practices.

#### 4.2. Sustainability Ecosystem Level in Tourism Development in East Sumba Tourism

The second system in sustainable tourism comprises the ecosystem, consisting of four dimensions: Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Based on Table 2 data, the average rating value is 6.43, which overall falls within the potentially sustainable category. However, three indicators are considered less sustainable: long-term congestion potential (S118), adequate water availability (SI21), and tourism mitigation implementation (S124).

Tourism management in East Sumba generates both positive and negative consequences. Generally, tourism activities in East Sumba can foster local community

awareness of the importance of environmental and cultural preservation as primary products of the tourism industry. Meanwhile, negative impacts of tourism activities include potential congestion from increased tourist flows, challenges in waste management, and conflicts among local communities (Butler et al., 2022). Waste issues in East Sumba are already becoming apparent, despite tourist visitation flows not yet being substantial. Plastic waste problems are increasingly exacerbating environmental pollution on land and at sea, as adequate waste management systems remain absent. From an institutional perspective, tourism management potentially triggers conflicts within local communities. The primary factors driving internal conflicts include dysfunctional institutions, a lack of transparency, and unclear programming.

The Ecosystem Quality dimension encompasses water resources, land, clean air, and tourism mitigation (Yin et al., 2022). East Sumba is a tourist area with extensive land and clean air, thanks to low pollution levels. In certain areas, water availability remains a fundamental challenge due to hilly terrain and the risk of drought. Natural springs constitute one water source for meeting community needs. Drought is the primary disaster threat to the East Sumba region, while other threats include floods, earthquakes, and tornadoes. Disaster issues in any area significantly influence tourist interest, necessitating robust mitigation as security assurance for tourists. Tourism mitigation in the East Sumba region has not yet been implemented optimally.

The Tourism Diversity dimension constitutes the primary attraction for tourists, including cultural uniqueness, handicrafts, culinary offerings, and natural beauty. The East Sumba region offers diverse and unique cultural tourism attractions, including traditional dances and customary ceremonies, which are still preserved by local communities (Afifa & Nugroho, 2022). One customary ceremony that continues is the death ritual according to Marapu beliefs. This ceremony aims to escort the deceased's soul to the afterlife, where the body can be preserved for years because families must prepare substantial costs for the burial procession. East Sumba offers weaving crafts that access international markets. Woven textiles are created by predominantly female craftspeople and feature various motifs that each possess its own philosophical significance. The culinary offerings remain severely limited, though some areas offer various fish preparations made from fishery products from the archipelagic region. East Sumba is an archipelagic region with significant marine natural resources, including beaches and fisheries. Beach potential attracts tourists with several characteristics, including sea-oriented interests and family travel patterns. The attractions offered by beach potential include striking natural scenery, exotic wildlife, and culture (Hall & Page, 2009), as well as atmospheric freedom, peaceful environments, and local cuisine (Sharpley, 2012).

Sustainable tourism cannot be realized without the Environmental Policy and Management dimension, as an aspect ensuring system functionality. The Environmental Policy and Management dimension includes healthy institutions, development programs, policies, and cooperation with various parties (Kapera, 2018). The Environmental Policy and Management dimension is potentially sustainable with average values of 6 and 7. The institutions managing tourism in East Sumba remain suboptimal, as evidenced by weak administration, ineffective management, and a lack of work programs. Tourism awareness group organizations and CBT managers, as organizations with distinct functions and roles, are often perceived as identical. This incorrect perspective regarding these organizations potentially triggers conflicts in tourism management. Tourism management remains incidental, lacking short-term, medium-term, and long-term planning, which can lead to unsustainable tourism. The government plays an important role in realizing sustainable tourism through policies that serve as references and protection in tourism management. The East Sumba district government, in general, and the Tourism Office, specifically, must issue policies for tourism management and conduct

regular training and assistance programs. The government represents one of the pentahelix elements that collaborate to support tourism management in East Sumba. Other pentahelix elements include academia, business, community, and media. The role of each pentahelix element in East Sumba tourism development includes: government as the policymaker and facilitator; academia supporting human resource capacity building; business supporting infrastructure development acceleration and capital provision; community supporting management systems; and media supporting publication as components of promotion and marketing. The government's role as policymaker is crucial to ensuring legal protection in island-based CBT management, which is vulnerable to degradation, and to optimizing women's empowerment.

#### *4.3. The Harmonization between the Human System and the Ecosystem of Sustainable Tourism Development in East Sumba*

The Barometer Figure shows the potentially sustainable quadrant, indicating that CBT in East Sumba offers opportunities for sustainable tourism development through efforts to balance the Human System and Ecosystem, facilitated by tourism pentahelix involvement. Collaboration with various parties can accelerate the optimization of sustainable indicators with low ratings. The potentially sustainable condition can decline to the intermediate quadrant or even to unsustainable status if strategic improvement efforts involving various stakeholders are absent. Women as resources become a strategic alternative for realizing sustainable tourism through optimal empowerment. Several aspects that remain unbalanced in sustainable tourism optimization include: 1) Gender equality efforts, yet women in East Sumba have not received opportunities to hold management positions, have not received operational roles, and cannot manage businesses independently, 2). Efforts to realize ideal institutions, yet tourism institutions, such as tourism awareness groups and tourism village managers, have not implemented administrative procedures, lack transparency, and have no work programs. 3) Efforts to build quality ecosystems, yet mitigation systems are not sufficiently robust, and water availability is inadequate, 4) Waste management efforts, yet still utilizing plastic elements in food and beverage packaging, 5). Efforts to increase tourist attractions, yet culinary processing using local raw materials remains minimal.

Based on the AMOEBA diagram, small pseudopodia are reaching with a rating value of 4, signifying a less sustainable status, namely indicators for long-term activities impacting density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Limited human resources and capital in tourism management are among the obstacles to securing adequate water supplies and mitigation systems. Therefore, it is crucial for all stakeholders to actively collaborate and take decisive steps to accelerate sustainable tourism management.

Pseudopodia with extensive reach maintain a rating value of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), possess unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and exhibit archipelago-based natural beauty potential (SI28). Women in Sumba have ample opportunity to play an active role in women's organisations, namely as administrators in organisations for family empowerment and welfare. Sumba women play an important role as preservers of Sumba's cultural heritage, as weavers of traditional fabrics. For the most part, women use weaving to generate income and improve their families' economic situation. The AMOEBA diagram is a tool for assessing the sustainability of community indicators by measuring their relative strengths and weaknesses. Based on this diagram, small pseudopodia reached a ranking value of 4, indicating a less sustainable status, namely indicators of long-term activities that affect density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Pseudopodia with a wide

reach maintain a rating of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), have unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and demonstrate the potential for archipelago-based natural beauty (SI28).

#### 4.4. Sustainable Tourism in East Sumba Archipelago through Women's Empowerment

Women's empowerment in realizing tourism in East Sumba is achieved through active participation in CBT management, from planning to monitoring. Women's involvement in CBT management in East Sumba remains limited and has not had a significant impact on families' or society's economic development. Optimization of women's empowerment is expected to reduce the still-elevated stunting rates on East Sumba Island. CBT represents a tourism development pattern that emphasizes local community empowerment to improve their economies through tourism business management (Steinicke & Neuburger, 2012). Empowering East Sumba communities, especially women, is fundamental to evaluating the achievements of tourism development. The most crucial empowerment component is empowered human resources, effectively managed to achieve development objectives (Abdullah et al., 2022). Women's empowerment becomes a strategic issue in East Sumba because it supports long-term, significant relationships with poverty alleviation and the reduction of stunting rates. This assertion aligns with Adnyani's (2024) research, which states that women's roles in indigenous communities in managing Balinese cultural tourism impact family economic resilience. Women in Bali fulfill dual roles by actively participating in various tourism businesses without abandoning family responsibilities.

Women's empowerment in the East Nusa Tenggara region faces various obstacles, including limited capital, unequal employment opportunities, and social gender stereotypes. However, there are significant opportunities for women to increase their participation in the tourism industry, potentially improving their welfare. Implementing inclusive tourism in the East Nusa Tenggara region can generate economic benefits for local communities.

#### 4.5. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago

East Sumba, as an archipelagic region, possesses tourism potential that could serve as an economic driver. Island potential packaged as tourism packages in CBT management can improve family economic independence. Sustainable tourism plays a role in poverty alleviation by emphasizing several factors, including environmental factors (Neto, 2003), social factors, and political factors (Hall & Page, 2009). PPT can serve as an effective poverty alleviation tool and supports tentative steps to realize its potential. PPT implementation using sustainable development approaches, through stakeholder involvement in corporate social responsibility, significantly impacts poverty alleviation (Diego, 2016).

Low PPT implementation in the business sector hinders tourism from fulfilling its role effectively, leading to stagnation and failure. Business sector involvement through CSR programs provides internal and external company benefits that impact economic, socio-cultural, and environmental aspects. Internal benefits include building reputation and business sustainability through improved company image and customer loyalty. External benefits include sustainable development as corporate social responsibility toward broader society (Diego, 2016). CSR's role in tourism development on East Sumba Island remains relatively modest. One CSR entity involved in tourism management on East Sumba Island, SMI, is an Indonesian State-Owned Enterprise operating in infrastructure financing. SMI's CSR program supports sustainable tourism development

in Watuhadang Village by enhancing the quality of creative economy products in the weaving and culinary sectors, improving restroom facilities, and increasing water availability through borehole construction. PT SMI constructed UV-curing equipment for weaving craftspeople to accelerate drying during the production of woven fabrics. UV Curing availability significantly helps craftspeople improve product quality and quantity. Food court construction enables the optimization of women's empowerment in the culinary sector, from raw material processing and planning to product marketing. Meanwhile, borehole construction promotes ecosystem quality by ensuring adequate water availability to support tourism activities. Access to clean water is one of the issues in the East Sumba region, which is highly vulnerable to drought disasters.

CSR programs that can contribute positively to poverty alleviation possess several characteristics: suitability for impoverished rural areas; labor-intensive approaches; empowerment of women and communities representing economically disadvantaged populations; and encouragement of tourism activities that create business opportunities (Spenceley & Meyer, 2012). CSR describes a multifaceted concept encompassing four categories of community expectations (Carroll, 2017): (1) economic expectations (i.e., companies should be profitable), (2) legal expectations (i.e., companies should operate within legal boundaries), (3) ethical expectations (i.e., business operations should meet specific ethical standards not required by law), and (4) philanthropic or discretionary expectations (i.e., companies should voluntarily contribute to addressing social needs, including poverty alleviation). CSR activities are voluntary, so companies bear consequences for their ethical or philanthropic responsibilities (Inoue & Lee, 2011). CSR maintains a substantial role in poverty alleviation through 'pro-poor CSR' programs. Pro-poor CSR encompasses several key initiatives, including poverty reduction, fostering relationships with local suppliers and informal sectors, promoting sustainable tourism practices, and preserving the natural environment of economically disadvantaged communities. Companies can collaborate with secondary stakeholders such as NGOs, government institutions, and international organizations (Smith & Ong, 2015)

## 5. Conclusions

Women represent a significant potential resource in East Sumba, given their considerable numbers and their status as unpaid family workers. Women's empowerment in East Sumba becomes a strategic issue due to cultural traditions and persistently strong patriarchal perspectives (Swari, 2023). Women play crucial roles in achieving family economic independence and reducing stunting rates through their involvement in tourism businesses. Tourism empowerment is measured through sustainable tourism approaches that encompass two inseparable systems: the human system and the ecosystem. The human system encompasses four key dimensions: political, economic, social, and production structure.

In contrast, the ecosystem comprises Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Each dimension contains four indicators, resulting in 32 indicators for measuring tourism sustainability levels in East Sumba. Based on scoring results for 32 indicators, tourism in East Sumba falls within the potentially sustainable category, with opportunities for sustainability through adjustments and strengthening several indicators. This research provides strategic recommendations to advance sustainable tourism, focusing on inclusive tourism through women's empowerment, the creation of thematic, integrated archipelago-based tourism packages, the establishment of healthy CBT institutions, and the strengthening of Pentahelix cooperation.

The theoretical implication of this research is to enrich references on women's empowerment in island tourism areas. The references offer concepts of inclusive and pro-

poor tourism management. Island tourism areas have unique and vulnerable characteristics, so this study is expected to provide strategic references. In practical terms, this study provides an overview of the sustainability of tourism developed in the Sumba Island tourism area through women's empowerment. The existing conditions serve as a reference for relevant stakeholders to formulate plans for Sumba women's participation in supporting sustainable tourism management.

This study offers several recommendations for women's empowerment in CBT across the archipelago. The implication of this research is to provide a broader understanding for various stakeholders, especially women, thereby increasing their involvement in the tourism industry. The active participation of women in the tourism business specifically increases family economic independence and, more generally, influences the financial movement of local communities in East Sumba Regency. Family economic independence in the short- and medium-term can significantly reduce stunting rates.

This research has limitations in geographic coverage, making it difficult for researchers to reach all tourist villages in East Sumba Regency. East Sumba Regency has 14 tourist villages that are relatively far apart, and internet access is limited, which poses an obstacle to data collection. Researchers need time and effort to get representative data. The research involved only two systems — namely, the Human System and the Ecosystem, each comprising eight dimensions and 32 indicators. Future research is expected to reach 14 tourist villages in East Sumba Regency. The research dimension can be enriched by including other under-researched areas, such as sociopreneurship and investment in CBT development.

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#### **Abbreviations**

The following abbreviations are used in this manuscript:

CBT	Community-Based Tourism
PPT	Pro-Poor Tourism
CSR	Corporate Social Responsibility
BTS	Barometer of Tourism Sustainability
ATSI	AMOEBAs of Tourism Sustainability Indicators
SI	Sustainability Indicator
SMI	Sarana Multi Infrastruktur
UBSI	Universitas Bina Sarana Informatika

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**No. 6**

**BUKTI KONFIRMASI**

**PENERIMAAN PUBLIKASI/**

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**(22 November 2025)**

The screenshot shows a Gmail interface with a search bar containing 'economies'. The left sidebar lists various mail folders: Mail (99+), Chat, Meet, Kotak Masuk (8,997), Berbintang, Ditunda, Penting, Terkirim, Draf (59), Kategori, Sosial (764), Info Terbaru (2,640), Forum (101), Promosi (3,492), and Selengkapnya. The main content area displays an email from 'Economies Editorial Office' (economies@mdpi.com) dated 'Sab, 22 Nov 2025, 20.47'. The email subject is '[Economies] Manuscript ID: economies-3946451 - Accepted for Publication'. The body of the email congratulates the recipient on the acceptance of their manuscript and provides details: Manuscript ID: economies-3946451, Type of manuscript: Article, Title: A Sustainable Development Approach to Women's Empowerment in Increasing Household Economic: Pro-poor Tourism Concept in the Archipelago Area, Authors: Ani Wijayanti \*, Bet El Silisna Lagarensen \*, Atun Yulianto, Received: 9 Oct 2025, and E-mails: ani.awi@bsi.ac.id, betlagarensen@polimdo.ac.id, atun.aty@bsi.ac.id. It also includes a link to the journal page and a note about editing and review.



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Authored by:

Ani Wijayanti; Bet El Silisna Lagarensen; Atun Yulianto

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**No. 10**

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## Article

# A Sustainable Development Approach to Women's Empowerment for Increased Household Economic Independence: Pro-Poor Tourism Concept in an Archipelago Area

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## Abstract

Community-Based Tourism (CBT) in East Sumba highlights its unique natural features through its archipelagic potential, which is synergistically integrated with rich traditional cultural experiences. Island-based CBT faces strategic management challenges, especially in empowering human resources—notably women—amid the inherently vulnerable and fragile nature of island tourism assets. Women's empowerment, a key element of pro-poor tourism, significantly influences poverty reduction and helps address the high rates of stunting in East Sumba. This research aims to examine women's empowerment within archipelago-based CBT management frameworks that impact household economic independence. The study adopts a sustainable tourism approach that involves two systems—the human system and the ecosystem—broken down into four dimensions and 32 indicators to assess the sustainability potential of each. Data analysis uses scoring methods to produce BTS and ATSI diagrams. Findings indicate that CBT in East Sumba falls within the potentially sustainable quadrant on the BTS diagram, with coordinates (6.88, 6.49). The average scores are 7.0 for the human system and 6.44 for the ecosystem, supported by the AMOEBA diagram, which shows broad tendencies. The most critical and vulnerable sustainability indicators include ecosystem integrity—particularly access to clean water—and effective mitigation strategies. Conversely, the indicators with the highest robustness include active women's participation in Family Empowerment and Welfare Organizations and tourism diversification, which is enhanced by East Sumba's strategic location within Indonesia's eastern tourism corridor. Stakeholders can leverage these findings by promoting women's empowerment through integrated tourism package innovations, thereby creating more entrepreneurial opportunities and improving household economic conditions. This research contributes to understanding women's empowerment through sustainable tourism methods, emphasizing its role as a foundation for pro-poor tourism within island-based CBT frameworks.

**Keywords:** women's empowerment; CBT; pro-poor tourism; archipelago tourism; household economic; human system; ecosystem

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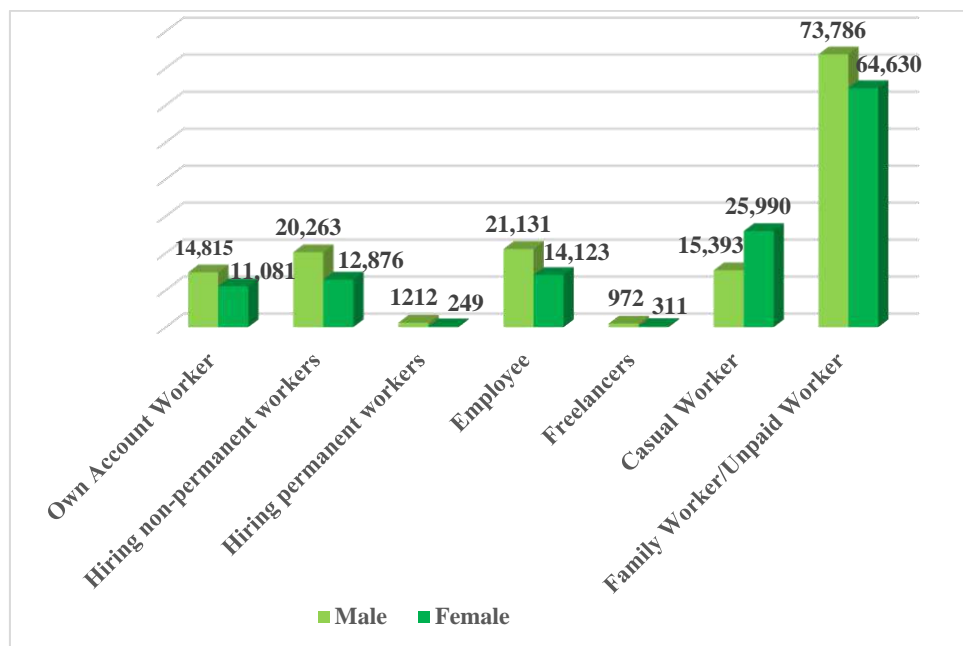
## 1. Introduction

East Sumba is a regency on Sumba Island, East Nusa Tenggara Province, Indonesia. In 2020, East Sumba Regency was classified as a disadvantaged region under Presidential Regulation No. 63 of 2020. Four years later, in 2024, it was successfully ranked as a developing region based on a decrease in the poverty rate, one of the critical indicators. According to data from the Central Statistics Agency of East Sumba (2025), the poverty rates for 2020, 2021, 2022, and 2023 were 29.65%, 29.68%, 28.22%, and 28.08%, respectively. Beyond these socioeconomic shifts, archipelagic destinations have unique opportunities to develop a strong identity and become resilient in the face of future crises (Figueroa & Rotarou, 2021). East Sumba Island, with its unique cultural heritage, has high potential for development as a tourist destination to boost its economy and reduce poverty. This potential is further highlighted by the regency's growing tourist appeal, as evident in the increase in foreign and domestic tourists from 2021 to 2023. The number of international tourist visits from 2021 to 2023 was 87 (2021), 813 (2022), and 2121 (2023). Meanwhile, the number of domestic tourist visits was 18,489 (2021), 34,083 (2022), and 50,635 (2023).

The management of island-based tourism potential faces several obstacles, including inadequate infrastructure, limited human resource capacity, weak planning, low local community participation, and a lack of collaboration (Nashrullah et al., 2025). Island tourism plays a vital role in maritime economic development (Mo & Qi, 2023), thereby requiring strategies to enhance competitiveness by empowering local communities. Developing sustainable ecotourism service systems is essential for islands that are more vulnerable and easily affected (Hsiao et al., 2021). The key component of marine ecotourism service systems is management capacity for mitigation, with ecological diversity serving as a core resource. Local communities work with stakeholders to build ecotourism systems that support conservation sustainability and increase tourist satisfaction (Hsiao et al., 2021). Management of the island focuses on personalized, nature-based experiences to promote sustainable tourism that benefits the local community economy (Figueroa & Rotarou, 2021). Sustainable tourism management requires an inclusive approach to institutional strengthening and community empowerment. Strengthening community empowerment involves investing in human resource capacity-building, participatory planning, and collaboration among tourism stakeholders to support long-term community welfare (Nashrullah et al., 2025). Efforts to promote sustainable island tourism often focus on cultural enhancement to attract visitors (Ge, 2020).

Managing island tourism through local community empowerment is a concept of pro-poor tourism (PPT) (Yang et al., 2021). PPT has developed since the early 2000s as a concept of sustainable tourism development through local community empowerment. Sustainable island tourism management can drive economic and social transformation (Cao et al., 2021). PPT can reduce poverty (Çolak et al., 2023) and have an impact on the environment and society through cooperation between various stakeholders (Wen et al., 2021). The implementation of PPT without involving the business sector has led to ineffectiveness, stagnation, and the failure of tourism businesses. CSR programs are one form of collaboration to realize PPT, which can harmonize cultural preservation and economic interests to realize sustainable tourism through various innovative initiatives (Wu et al., 2023). The PPT program is implemented through a social innovation approach and the strengthening of traditions to encourage the transformation of community power structures (Hazenbergh et al., 2025). Based on East Sumba statistics for 2024, women's empowerment remains comparatively limited. The majority of women in East Sumba are homemakers without income-generating activities (family workers or unpaid laborers), totaling 64,630, due to restricted opportunities for active participation in industrial sectors (Central Statistics Agency of East Sumba, 2025). This data demonstrates that most women

remain unproductive and unable to contribute to the family's economic reinforcement. Productive-age population statistics are presented in Figure 1.



**Figure 1.** Population 15 Years and Over who Worked During the Previous Week by Main Employment Status and Sex in East Sumba Regency, 2023. Source: East Sumba regency in Figures 2024. Source: Central Statistics Agency of East Sumba, 2025

Women's empowerment in East Sumba remains relatively limited due to two main factors: patriarchal norms and educational levels. In some aspects of social life in East Sumba, men still serve as the primary decision-makers in families and communities across various areas of life. Meanwhile, women are seen as holding subordinate roles and are more vulnerable to different forms of violence. Educational attainment in East Sumba is mainly at the primary school level. In 2022 and 2023, it was reported that over 98% of individuals had completed primary education (Central Statistics Agency of East Sumba, 2025). Women's empowerment in East Sumba aims to improve family welfare, thereby helping to lower the persistently high stunting rate, which averaged 15% from 2021 to 2024 (Central Statistics Agency of East Nusa Tenggara Province, 2025). This rate exceeds the government target of below 14%. Women's empowerment through pro-poor tourism management grounded in archipelagic traits is a strategic option for boosting family economics and overall societal conditions.

Sustainable tourism promotes equitable tourism by empowering women in many domains (Jamal & Higham, 2021). Eco-feminist paradigms for eco-cultural justice (Camargo et al., 2016) and feminist epistemological views (Eger et al., 2022) also support women's empowerment. Women's empowerment is key to successful tourism development and to long-term poverty reduction. Examples include Balinese women in indigenous communities. They actively participate in tourism, supporting family resilience while still fulfilling family duties (Adnyani & Purnamawati, 2024). Gender inequality has become a global concern, acting as a barrier to women's empowerment in tourism development. Women are more likely to have insecure jobs, earn less, and have fewer career opportunities (Nanthini & Nair, 2020). Gender inequality began with physical differences; however, it evolved due to social, historical, and cultural factors (Jule, 2014), such as patriarchal restrictions for Arab women (Zuhur, 2003) and Confucian traditions in China (Hao et al., 2021). Gender inequalities block truly sustainable human

development, and understanding gender in local contexts is needed. Achieving gender equality helps business development, service quality, and customer satisfaction (Wan & Chan, 2018). Women's empowerment can help reduce vulnerability and boost resilience and sustainability in the face of global climate and pandemic crises (Kalisch & Cole, 2023).

Sustainable tourism management through the concept of empowerment involves two systems as key indicators; namely, the human system and the ecosystem (Ko, 2005). Human system indicators include politics, economics, socio-culture, and production structures, while ecosystem indicators include environmental impact, ecosystem quality, biodiversity, and environmental policy and management. The presence of women within the human system plays an essential role in realizing sustainable tourism. The tourism industry offers opportunities for women to take on roles within organizational hierarchies (Vujko et al., 2024), contribute innovative ideas or frameworks (McCall & Mearns, 2021), and participate in tourism development planning (Rahmawati & Darwis, 2023). Women's active involvement in tourism-related organizations mainly remains limited to women's groups, such as Family Empowerment and Welfare (Wirdawati et al., 2024).

The achievement of sustainable tourism is shown through economic impacts, especially the creation of entrepreneurial opportunities and the growth of local community economies. Women's empowerment is realized through active involvement in various tourism businesses (McCall & Mearns, 2021), opening doors to start independent businesses (Wardhani & Susilowati, 2021), which in turn leads to increased income (I. Idris et al., 2023; Vukovic et al., 2023), thus supporting household economic independence (Borović et al., 2022). From a social perspective, sustainable tourism creates opportunities for women to participate socially through various tourism industries (Rahmawati & Darwis, 2023). Active involvement in tourism boosts women's self-confidence (Hao et al., 2021), promotes gender equality (Ghimire et al., 2024), raises awareness of the importance of self-development and future generations (Pécot et al., 2024), and fosters increased pride (Rasoolimanesh et al., 2017). Sustainable tourism promotes optimal tourist satisfaction through strengthening service and product quality standards. Tourist experiences are shaped by complex interactions that can encourage tourists to revisit destinations. Sustainable tourism can include products created from environmentally sustainable raw materials, promote environmental and cultural conservation through infrastructure development (El-Manhaly & Taha, 2024), and build on adequate skills and knowledge from local communities (Pécot et al., 2024).

Tourism management produces both positive and negative effects (Butler et al., 2022). The positive aspects of tourism businesses include raising awareness of the importance of protecting the environment and culture. On the other hand, long-term adverse effects can consist of conflicts among local communities (Simpson, 2008), increased waste, and traffic congestion (Pearce & Chen, 2012). Sustainable tourism should create healthy ecosystems, including sufficient water resources, suitable land for tourism activities, and clean air (Yin et al., 2022), as well as the adoption of tourism mitigation strategies (Afifa & Nugroho, 2022). Sustainable tourism is closely linked to tourism diversification (O'Halloran, 2020), which includes traditional cultural uniqueness, handcrafted crafts and culinary arts, and natural attractions found on islands (Mrđa & Carić, 2019). Sustainable tourism involves establishing strong institutions that operate efficiently, uphold development programs and policies regulating tourism growth, and foster effective collaboration with various stakeholders (Kapera, 2018).

The Global Sustainable Tourism Development Council (GSTC) states that sustainable tourism applies four pillars: environmental, economic, social, cultural, and management. Implementing these four pillars benefits local communities and improves destination quality (Borland & Lindgreen, 2013). The conceptualization of sustainable tourism through four pillars is realized through stakeholder synchronization and training

programs (Hizmi & Junaid, 2023), which are key to successful sustainable development (Junaid et al., 2022). Tourism environment, as the foundation of sustainable tourism development, encompasses the natural, economic, and social and cultural environments (Ge, 2020). Sustainable tourism development influences environmental conservation, economic development, and social progress (Hernández-Cuevas et al., 2024).

This research examines women's empowerment in island-based CBT located in East Sumba Regency, East Nusa Tenggara. Archipelago tourism has characteristics distinct from those of urban or rural tourism and is more vulnerable to environmental degradation. The findings offer an overview of current conditions related to women's empowerment through CBT management, which influences family economic improvement. CBT, as a model of sustainable tourism, plays a crucial role for both impoverished and non-impoverished households and helps reduce poverty by empowering communities through tourism enterprises (Thomas, 2025). The study provides strategic recommendations for reducing poverty through women's empowerment in tourism businesses, supporting household economic growth and independence. The implications include reconceptualizing women's empowerment in light of the study's findings. The research adds new insights by focusing on women's empowerment in island-based tourism areas to help reduce poverty and promote sustainable tourism goals.

Previous research has examined women's empowerment in CBT (McCall & Mearns, 2021; P. A. Idris & Rahmawati, 2021; El-Manhaly & Taha, 2024), pro-poor tourism (Yang et al., 2021), and archipelago-based tourism (Lewis-Cameron & Brown-Williams, 2022; Figueroa & Rotarou, 2021; Hsiao et al., 2021) in fragmented approaches. This research integrates three tourism management variables, which are assessed using a sustainable tourism methodology—first, women's empowerment as SDG 5: Gender Equality. Second, archipelagic regions are key components of marine tourism, serving as primary attractions in Indonesia, as an archipelagic nation; island tourism offers unique potential but also involves fragile and easily compromised characteristics, which require effective and efficient management strategies. Third, pro-poor tourism as SDG 1: No Poverty. Strategies for poverty alleviation are a strategic concern in eastern Indonesian regions, including East Nusa Tenggara.

## 2. Methodology

### 2.1. Research Design

The research design adopts a descriptive quantitative methodology with a focus on sustainable tourism. The quantitative approach is used to measure indicators of sustainable tourism assessment, covering two systems: the Human System and the Ecosystem. Primary data is collected through observation and interviews to determine scores, while secondary data is obtained from third-party sources, both online and offline. Primary data was collected through Focus Group Discussion (FGD) using survey and interview methods from June to August 2025. The FGD was conducted with approval from the East Sumba Regency Government, dated 10 June 2025, which authorized the Tourism and Culture Office to facilitate the availability of key respondents and informants for data collection. Participants in primary data collection include women involved in tourism management, tourism village managers, tourism awareness groups, village officials, and other relevant stakeholders. Secondary data from third parties was obtained from the tourism office, the central statistics agency, and stakeholders involved in CBT management, including CBT management documents, tourism development programs, and related data. Secondary data was collected over a period of five months, from April to August 2025. The study was carried out in eight tourism villages in East Sumba, located

from east to southeast: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Lambanapu, and Prailiu. Village selection was based on their characteristics as cultural tourism sites with significant potential for women's empowerment. The village groups involved in the research are referred to as society.

## 2.2. Data Analysis Techniques

The data analysis technique employs the Barometer of Tourism Sustainability (BTS) and AMOEBA of Tourism Sustainability Indicators (ATSI) methodologies. BTS elucidates the comprehensive sustainability level of human systems and ecosystems (Prescott-Allen, 1997). The sustainability barometer presents a systematic approach to measuring and communicating community welfare and progress toward sustainable development, producing conclusions about human systems and ecosystem conditions, and the effects of human interaction with ecosystems. The BTS methodology provides researchers with the opportunity to select their own indicators to measure humans and ecosystems as an integrated system and to assess the entire system and its components (Guijt et al., 2001). The system barometer presents the sustainability of tourism management in five ratings. These ratings are measured on a score range: Unsustainable Tourism ( $0 \geq X > 2$ ), Potentially Unsustainable Tourism ( $2 \geq X > 4$ ), Intermediate ( $4 \geq X > 6$ ), Potentially Sustainable Tourism ( $6 \geq X > 8$ ), and Sustainable Tourism ( $8 \geq X \leq 10$ ). The barometer also presents the coordinates of measurement results for 32 indicators that describe the sustainability status of tourism management. AMOEBA of Tourism Sustainability Indicators (ATSI) explains the sustainability level of these tourism indicators (Bell & Morse, 1999; Ten et al., 1991). ATSI is the result of measurements from 32 indicators. It is presented in the AMOEBA visualization, which illustrates the level of sustainability: the wider the AMOEBA, the stronger the sustainability. The ATSI visualization design uses a radar chart created in Excel.

BTS and ATSI analysis techniques provide a visual overview of the sustainability conditions of tourism management in a geographical area (Ko, 2005). The BTS and ATSI analysis stages comprise several phases: determining the community; identifying the system, dimensions, and indicators; determining the indicator weights and scales; calculating indicator scores; and presenting the results in visual form. The research employs 32 indicators to measure tourism sustainability, referred to as Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1–2 are assessed as highly unsustainable, ratings 2–4 are evaluated as less sustainable, rating 5 is estimated as neutral, ratings 6–7 are evaluated as potentially sustainable, and ratings 8–10 are assessed as highly sustainable (Sugiyono, 2020). Each indicator is assigned a weighting based on its contribution to the system being measured. The measurement results from 32 indicators, obtained through the rating process, are entered into a table and multiplied by their respective weights to produce a score. The total score for each system produces coordinates that are presented on the Barometer graph, while the rating values are presented in the AMOEBA visualization. Research indicators are formulated based on relevant theoretical foundations, as presented in Table 1.

**Table 1.** Sustainable Indicators (SI).

<b>Society</b>		
<b>Traditional Villages in East Sumba: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Prailiu, Lambanapu</b>		
<b>System</b>	<b>Dimension</b>	<b>Indicators</b>
The Human System	Politic	SI1 Women occupy strategic positions in organizational management (Vujko et al., 2024)
		SI2 Women have opportunities to express their opinions (McCall & Mearns, 2021)
		SI3 Women participate in tourism development planning (Rahmawati & Darwis, 2023)
		SI4 Women develop women's institutions, such as the Family Welfare Movement (Wirdawati et al., 2024)
	Economic	SI5 Women are actively involved in various tourism business sectors (El-Manhaly & Taha, 2024)
		SI6 Women have opportunities to establish independent businesses in the tourism sector (Wardhani & Susilowati, 2021)
		SI7 Women generate income from tourism to strengthen the economy (Borović et al., 2022)
		SI8 Women experience increased economic independence (Rahmawati & Darwis, 2023)
	Social Dimension	SI9 Women gain self-confidence through tourism involvement (Vujko et al., 2024)
		SI10 Women have opportunities to socialize through tourism businesses (El-Manhaly & Taha, 2024)
		SI11 Women achieve gender equality through the tourism business (Ghimire et al., 2024)
		SI12 Women possess awareness for self-development and future generations (Pécot et al., 2024)
	Production Structure	SI13 Women process environmentally friendly raw materials (El-Manhaly & Taha, 2024)
		SI14 Women play active roles in environmental and cultural conservation (Butler et al., 2022)
		SI15 Women are actively involved in local infrastructure management (El-Manhaly & Taha, 2024)
		SI16 Women possess adequate skills and knowledge (Wirdawati et al., 2024)
Environmental Impacts (Butler et al., 2022)	SI17 Fostering awareness to participate in environmental conservation actively	
	SI18 Long-term activities impact population density and congestion.	
	SI19 Tourism activities potentially generate waste from tourism-related activities.	
	SI20 Tourism management potentially triggers conflicts among local communities.	
The Ecosystem	Ecosystem Quality (Yin et al., 2022)	SI21 Community-Based Tourism (CBT) has adequate water resources
		SI22 CBT has adequate and representative land for the tourism business
		SI23 CBT maintains clean air quality that poses no risk to human health
		SI24 CBT implements tourism mitigation programs
	Tourism diversity (Afifa & Nugroho, 2022)	SI25 CBT possesses a unique traditional culture
		SI26 CBT produces distinctive handicrafts
		SI27 CBT offers distinctive cuisine
		SI28 CBT features natural beauty based on archipelagic characteristics
Environmental Policy and Management (Kapera, 2018)	SI29 CBT maintains healthy governance and executes its functions and responsibilities	
	SI30 CBT implements sustainable tourism development programs	
	SI31 CBT establishes policies that regulate development	
	SI32 CBT maintains extensive cooperation with various stakeholders	

Source: developed from Ko (2005).

### 3. Results

#### 3.1. General Overview of CBT in East Sumba

The research utilizes eight CBTs, including Mondu, Lambanapu, Malumbi, Prailiu, Watuhadang, Rindi, Kaliuda, and Lainjanji. Mondu Village is located in Kanatang District and covers 90.45 km<sup>2</sup>. The tourism potential of Mondu Village includes savanna landscapes, Mangejing ritual culture, Padadita traditional village, Tanggedu waterfall, Kapihak Beach, and a creative economy through weaving, lontar leaf handicrafts, and statue carving. The population of Mondu Village is 1596, primarily engaged in farming, livestock breeding, and fishing. Lambanapu Village is situated in Kambera District, covering 795 hectares, with a population of 3191. The area is mainly rice fields and agricultural land, so most residents work in farming. Its tourism attractions include the Kambaniru River, the Lambanapu archeological site, the cultural house, weaving, the Tanau and Seribu hills, the Ori Angu Dance Studio, and the Li Luri Studio. Both Mondu and Lambanapu villages are vulnerable to flood disasters. Malumbi Village, located in East Wewewa District, spans 11.2 km<sup>2</sup> with 2467 residents, mostly farmers and artisans. Its tourism potential includes the Kambaniru River and Dam, herbal hills, weaving, betel nut processing sites, and bamboo crafts. Prailiu Village is in Kahaungu Eti District, covering 51 hectares and home to 7874 residents who work as farmers and artisans. Attractions include Prailiu Village, Hamayang (Traditional Ritual), Parunggara tour (Guest Welcome), Hambu marata (bride welcomed in the village of origin), Puru la kamaidu (harvest ceremony), Palupang Djara (Horse Racing), megalithic stones, mangrove tourism, Batu Payung Beach, traditional dance, ikat weaving crafts, and specialty foods like Manggulu, kaparak, instant ginger beverages, and moringa biscuits. Watuhadang Village, in Umalulu District, covers 1020 hectares and has 2954 residents engaged in farming, livestock breeding, and weaving. Its tourism potential includes traditional villages, megalithic graves, traditional houses, pahikung weaving, savanna hills, and the kendingan dance. Watuhadang is relatively safe from natural disasters. Rindi Village, in Rindi District, covers 57 km<sup>2</sup> and has 1702 residents, mainly farmers, livestock breeders, and fishermen. Its attractions consist of noble graves, the tarik bati tradition, the Praiyawang traditional village, and stone carving crafts. The town faces risks from floods and storms. Kaliuda Village, in Pahunga Lodu District, spans 110 hectares and is home to 4238 residents engaged in farming, fishing, livestock breeding, and artisan work. Its tourism appeals include ancestral culture on woven fabrics and Priau customs, Marapu traditional funeral rituals, megalithic graves, weaving crafts, seaweed farming, the Nalu and Kanggoa Rivers, the Priau traditional village, Tandening savanna grassland (the longest savanna), and traditional dance. Kaliuda is vulnerable to natural hazards, including floods, tsunamis, and earthquakes. Lainjanji Village, in Wulla Waijilu District, covers 97.2 km<sup>2</sup> with 1500 residents, who mainly work as farmers, plantation workers, and fishermen. The area's attractions include coastal flows and savanna grasslands. The tourism potential consists of the Lainjanji River, Woranu River, Praibakal River, Waturparunu Beach, hot springs, ikat weaving, and seaweed farming.

The selection of these eight CBTs was based on regional characteristics and potential, specifically traditional cultural assets, weaving crafts, and natural resources from the archipelago. Villages known for weaving have significant potential to empower women because most weaving artisans are women. These eight CBTs pose challenges to women's empowerment in tourism management, potentially affecting their families' economic independence. Based on data collected through observation, interviews, and documentation, the assessments of 32 indicators are shown in Table 2.

**Table 2.** Sustainable Indicator (SI) Assessment.

System	Dimension	Indicator	Weight	Rating	Score	System	Dimension	Indicator	Weight	Rating	Score
(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
The Human System	Politic	SI1	0.08	6.00	0.50	The Ecosystem	Environmental Impacts	SI17	0.07	7.00	0.51
		SI2	0.06	8.00	0.44			SI18	0.02	4.00	0.10
		SI3	0.06	6.00	0.33			SI19	0.07	6.00	0.44
		SI4	0.03	9.00	0.25			SI20	0.05	6.00	0.29
	Economic	SI5	0.08	7.00	0.58		SI21	0.07	4.00	0.29	
		SI6	0.03	7.00	0.19		Ecosystem Quality	SI22	0.07	6.00	0.44
		SI7	0.08	6.00	0.50			SI23	0.05	7.00	0.34
		SI8	0.08	6.00	0.50			SI24	0.07	4.00	0.29
	SI9	0.06	7.00	0.39	SI25			0.07	9.00	0.66	
	Social	SI10	0.06	8.00	0.44		Tourism diversity	SI26	0.07	9.00	0.66
		SI11	0.08	8.00	0.67			SI27	0.07	6.00	0.44
		SI12	0.06	7.00	0.39			SI28	0.05	9.00	0.44
		SI13	0.08	8.00	0.67			SI29	0.07	6.00	0.44
	Production Structure	SI14	0.06	8.00	0.44		Environmental Policy and Management	SI30	0.05	6.00	0.29
		SI15	0.03	5.00	0.14			SI31	0.05	7.00	0.34
		SI16	0.07	6.00	0.44			SI32	0.07	7.00	0.51
$\bar{x} = 7$					$\Sigma = 6.88$		$\bar{x} = 6.44$ $\Sigma = 6.49$				

Table 2 shows the results of sustainable tourism measurements using human systems and ecosystems, covering eight subsystems. The rating value presents measurement results for 32 weighted indicators. The score is calculated by multiplying the weighted value by the rating value. In Table 2, column 1 lists a rating of 6 for the sustainable indicator (SI). The score of 0.5 is the product of the weighted value and the rating value. The total indicator score for the human system is the X-coordinate value. The total score for the ecosystem indicator is the Y-coordinate value, representing the sustainable condition in the Barometer graph. The rating value also shows the sustainable condition for each indicator, as presented in the AMOEBA visualization.

### 3.2. **Barometer of Tourism Sustainability (BTS) Quadrant of Sustainability Levels**

Based on scoring values in Table 2, the axis value (X; Y) is (6.88; 6.49), which is in the potentially sustainable quadrant, as shown in Figure 2. This quadrant highlights opportunities for sustainable CBT in East Sumba, emphasizing the balance between the Human System and Ecosystem with tourism pentahelix involvement.

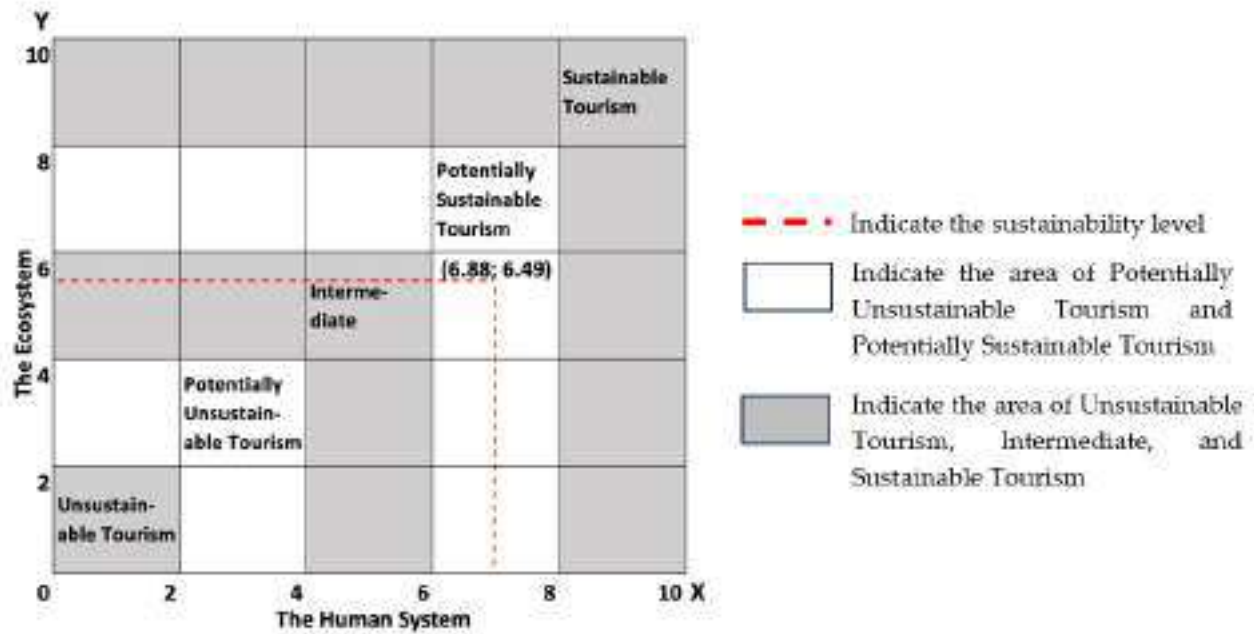
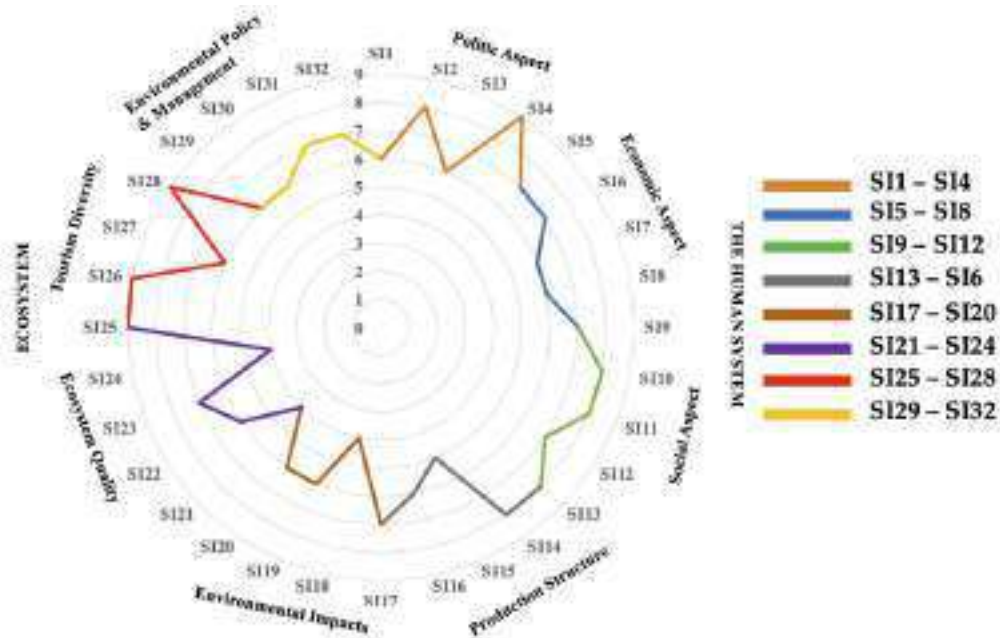
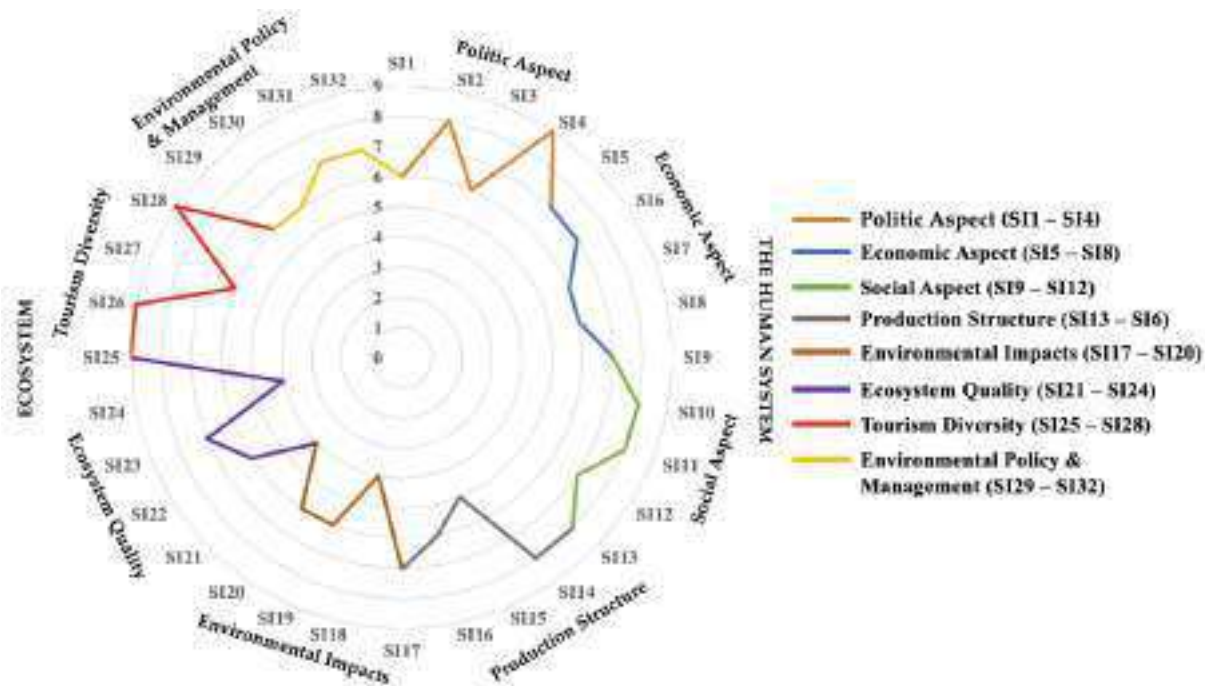


Figure 2. Barometer of Tourism Sustainability (BTS).

3.3. AMOEBA of Tourism Sustainability Indicator (ATSI) Sustainability Indicators Value

Based on Table 2, the AMOEBA diagram in Figure 3 illustrates the level of tourism sustainability in East Sumba.





**Figure 3.** AMOEBA of Tourism Sustainability Indicator (ATSI).

The AMOEBA figure indicates potentially sustainable tourism development on East Sumba Island by its broad coverage. The extent of pseudopodia reflects the magnitude of indicator values: the wider the reach, the higher the value.

## 4. Discussion

### 4.1. Sustainability Level of the Human System in East Sumba Tourism

The human system in sustainable tourism comprises political, economic, social, and production dimensions. Table 2 shows that the average human system assessment is 7, indicating potentially sustainable conditions. However, the women's empowerment indicator in local infrastructure management (SI15) shows relatively low scores of 5. Women's involvement can be improved by making homestay management a central accommodation for CBT. Most CBTs have not provided homestays due to limited staff knowledge and skills, instead renting parts of residents' rooms for tourists. Existing homestays operate independently from residents' houses, resulting in little interaction between tourists and hosts (Wijayanti & Dewi, 2023). Women's empowerment has reached relatively optimal levels in several tourist destinations, such as Bali, Banyuwangi, Bantan, and Yogyakarta, where women play key roles as business managers, tourism promoters, and preservationists (Sirad et al., 2025).

The political aspect is assessed through women's participation in institutions directly and indirectly linked to the tourism industry. As seen in Table 2, the highest rating indicator is 9, indicating that women in East Sumba run an organizational forum through community-based groups focused on family empowerment, specifically the Family Welfare Movement (SI14) (Wirdawati et al., 2024). However, women's involvement in tourism-related organizations remains limited, especially in Tourism Awareness Groups and Tourism Village Management bodies. The hierarchy within tourism organizations remains male-dominated, limiting women's roles in planning. Although women have opportunities to share their ideas and opinions verbally and in writing about tourism development (McCall & Mearns, 2021), the management process from planning to oversight is mainly carried out by men. Women's active participation in East Sumba's

tourism growth primarily focuses on tourism business activities, particularly in culinary services, the creative economy, and cultural preservation.

The dimensional indicator measurements shown in Table 2 indicate that while women's empowerment in the tourism industry has reached a sustainable level, its positive impact on economic growth remains limited. This limited impact is partly due to the lack of coordinated and comprehensive support. As a result, women's empowerment efforts remain scattered and do not effectively drive long-term economic development or sustainability. For example, although weaving is a common form of women's empowerment in East Sumba's CBT, the lack of integration across the production and marketing phases limits weavers' ability to increase their income and contribute to broader economic resilience.

Tourism development in East Sumba aims to drive economic growth and improve families' financial independence by empowering women. Women's participation is expected to stimulate tourism growth across the region. As of 2024, 64,630 women in East Sumba are housewives without income—51.94% of the female population and 25.29% of the total population. Women's involvement primarily remains in small-scale operations, with limited roles in starting independent enterprises, which is the main barrier to strengthening the family economy (Borović et al., 2022).

Culinary attractions in East Sumba remain limited in both quantity and quality. The variety of cuisine offered lacks diversity and is presented simply with insufficient representation. Residents produce cuisine in relatively small amounts due to limited market access. Specialty dishes are not consistently available and are often only made upon request or during tourist visits. East Sumba's specialty dishes include Manggolu (made from kepok bananas and peanuts) and Kaparak (made from corn, rice, and sago). Other culinary options include Woba (seaweed) from Kaliuda Village, lobster from Lainjanji Village, and instant ginger beverages and moringa biscuits from Prailiu Village. Women's empowerment in culinary management can be improved through increased training in culinary skills, packaging, and marketing strategies.

Women's active participation in the creative economy and cultural preservation sectors is clear through handicrafts and traditional dances that attract tourists. East Sumba's notable handicrafts include ikat-woven textiles and pahikung, which vary from village to village. Women play key roles as artisans and keepers of weaving history and cultural traditions. East Sumba includes several weaving artisan communities, such as Karaja Sumba, Praiyawang, Pau, Prailiu, Kanatang, and Kaliuda. East Sumba features various unique traditional dances with significant historical importance, often performed during traditional ceremonies and to welcome distinguished guests. These dances, as part of tourism attractions, are curated to offer compelling experiences for visitors. Some of the preserved dances in East Sumba include Hogor Watang from Kaliuda village, Tebe and Dho'a dances from Lainjanji village, Ori Angum Dance Studio and Li Luri Dance Studio from Lambanapu village, and Kendingan Dance from Watuhadang village.

Integrated tourism package development can serve as a strategy to enhance family livelihoods by empowering women in East Sumba. Tourism packages are designed around various potentials in an integrated, thematic approach, encompassing cultural assets, natural resources, the creative economy, culinary offerings, and other potentials, all managed through women's empowerment. Integrated tourism packages offer substantial opportunities for women to participate actively in tourism enterprises, from planning to monitoring. Women have opportunities to develop thematic tourism packages related to weaving, integrated with other tourism potentials, thereby enabling woven fabric products to achieve higher economic value. Tourists demonstrate willingness to pay premium prices for tourism packages because they not only acquire woven fabrics as handicraft products but also gain historical and cultural experiences with

considerable educational value. Thematic tourism packages stimulate economic acceleration by engaging resources in both quantity and quality, including women. Women serving as weaving artisans fulfill dual roles: producing woven fabric, packaging, and presenting products to tourists.

Women in East Sumba recognize that their empowerment in the tourism industry generates substantial social impacts, such as increased gender equality, confidence, and skills. Survey assessment scores of 7 and 8 in Table 2 reflect these outcomes. Through empowerment, women gain wider access to operational and leadership roles within tourism management, leading to greater representation and influence in decision-making. Their active involvement also raises awareness and promotes the development of new knowledge, benefiting both individuals and the community. As women take on greater responsibility in tourism, they help foster a more inclusive and equitable industry, enabling broader participation and social progress.

The production structure dimension, which encompasses both services and high-quality products, is a key element supporting the sustainability of the tourism area. Service elements are closely connected to human resource capacity as the leading actors in tourism management (Wirdawati et al., 2024). Success in CBT management heavily depends on local human resource capacity since it operates by, from, and for the community. In Table 2, ratings for indicators related to women's involvement in local infrastructure management and to skills and knowledge in the tourism sector remain relatively low. This is supported by East Sumba Regency data from 2024, showing that community education is primarily at the primary school level, accounting for over 98%. Improving human resource capacity is a critical, urgent step toward sustainable tourism. The quality of tourism products depends on effective management systems supported by sufficient infrastructure (El-Manhaly & Taha, 2024). In East Sumba, local infrastructure in tourism areas is still limited in both availability and accessibility. Restroom facilities, which are essential amenities for tourists, are scarce and often in poor condition. Increased involvement from various stakeholders is needed to accelerate the development of tourism infrastructure and enhance human resource capacity. Stakeholder programs related to infrastructure development include CSR efforts from Sarana Multi Infrastruktur (SMI) in partnership with Universitas Bina Sarana Informatika (UBSI). SMI has helped build restrooms, food courts, UV curing equipment for weaving, and water wells in Watuhadang village. At the same time, UBSI has provided training and support to boost human resource capacity.

According to Table 2, women's empowerment receives high ratings in the processing of environmentally sustainable raw materials and in conservation efforts. Women actively participate in cultural conservation by maintaining weaving traditions and preserving traditional dances (Butler et al., 2022). The use of naturally sourced coloring materials for dyeing threads to be woven into fabrics, such as *Morinda citrifolia* roots, indigo leaves, tree bark, and clay, further demonstrates engagement with sustainable practices.

#### *4.2. Sustainability Ecosystem Level in Tourism Development in East Sumba Tourism*

The second system in sustainable tourism comprises the ecosystem, consisting of four dimensions: Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Based on Table 2 data, the average rating value is 6.43, which overall falls within the potentially sustainable category. However, three indicators are considered less sustainable: long-term congestion potential (S118), adequate water availability (SI21), and tourism mitigation implementation (S124).

Tourism management in East Sumba generates both positive and negative consequences. Generally, tourism activities in East Sumba can foster local community awareness of the importance of environmental and cultural preservation as primary

products of the tourism industry. Meanwhile, negative impacts of tourism activities include potential congestion from increased tourist flows, challenges in waste management, and conflicts among local communities (Butler et al., 2022). Waste issues in East Sumba are already becoming apparent, despite tourist visitation flows not yet being substantial. Plastic waste problems are increasingly exacerbating environmental pollution on land and at sea, as adequate waste management systems remain absent. From an institutional perspective, tourism management potentially triggers conflicts within local communities. The primary factors driving internal conflicts include dysfunctional institutions, a lack of transparency, and unclear programming.

The Ecosystem Quality dimension encompasses water resources, land, clean air, and tourism mitigation (Yin et al., 2022). East Sumba is a tourist area with extensive land and clean air, thanks to low pollution levels. In certain areas, water availability remains a fundamental challenge due to hilly terrain and the risk of drought. Natural springs constitute one water source for meeting community needs. Drought is the primary disaster threat to the East Sumba region, while other threats include floods, earthquakes, and tornadoes. Disaster issues in any area significantly influence tourist interest, necessitating robust mitigation as security assurance for tourists. Tourism mitigation in the East Sumba region has not yet been implemented optimally.

The Tourism Diversity dimension constitutes the primary attraction for tourists, including cultural uniqueness, handicrafts, culinary offerings, and natural beauty. The East Sumba region offers diverse and unique cultural tourism attractions, including traditional dances and customary ceremonies, which are still preserved by local communities (Afifa & Nugroho, 2022). One customary ceremony that continues is the death ritual according to Marapu beliefs. This ceremony aims to escort the deceased's soul to the afterlife, where the body can be preserved for years because families must prepare substantial costs for the burial procession. East Sumba offers weaving crafts that access international markets. Woven textiles are created by predominantly female craftspeople and feature various motifs that each possess its own philosophical significance. The culinary offerings remain severely limited, though some areas offer various fish preparations made from fishery products from the archipelagic region. East Sumba is an archipelagic region with significant marine natural resources, including beaches and fisheries. Beach potential attracts tourists with several characteristics, including sea-oriented interests and family travel patterns. The attractions offered by beach potential include striking natural scenery, exotic wildlife, and culture (Hall & Page, 2009), as well as atmospheric freedom, peaceful environments, and local cuisine (Sharpley, 2012).

Sustainable tourism cannot be realized without the Environmental Policy and Management dimension, as an aspect ensuring system functionality. The Environmental Policy and Management dimension includes healthy institutions, development programs, policies, and cooperation with various parties (Kapera, 2018). The Environmental Policy and Management dimension is potentially sustainable with average values of 6 and 7. The institutions managing tourism in East Sumba remain suboptimal, as evidenced by weak administration, ineffective management, and a lack of work programs. Tourism awareness group organizations and CBT managers, as organizations with distinct functions and roles, are often perceived as identical. This incorrect perspective regarding these organizations potentially triggers conflicts in tourism management. Tourism management remains incidental, lacking short-term, medium-term, and long-term planning, which can lead to unsustainable tourism. The government plays an important role in realizing sustainable tourism through policies that serve as references and protection in tourism management. The East Sumba district government, in general, and the Tourism Office, specifically, must issue policies for tourism management and conduct regular training and assistance programs. The government represents one of the

pentahelix elements that collaborate to support tourism management in East Sumba. Other pentahelix elements include academia, business, community, and media. The role of each pentahelix element in East Sumba tourism development includes: government as the policymaker and facilitator; academia supporting human resource capacity building; business supporting infrastructure development acceleration and capital provision; community supporting management systems; and media supporting publication as components of promotion and marketing. The government's role as policymaker is crucial to ensuring legal protection in island-based CBT management, which is vulnerable to degradation, and to optimizing women's empowerment.

#### *4.3. The Harmonization Between the Human System and the Ecosystem of Sustainable Tourism Development in East Sumba*

The Barometer Figure shows the potentially sustainable quadrant, indicating that CBT in East Sumba offers opportunities for sustainable tourism development through efforts to balance the Human System and Ecosystem, facilitated by tourism pentahelix involvement. Collaboration with various parties can accelerate the optimization of sustainable indicators with low ratings. The potentially sustainable condition can decline to the intermediate quadrant or even to unsustainable status if strategic improvement efforts involving various stakeholders are absent. Women as resources become a strategic alternative for realizing sustainable tourism through optimal empowerment. Several aspects that remain unbalanced in sustainable tourism optimization are as follows: (1) Despite gender equality efforts, women in East Sumba have not yet received opportunities to hold management positions, have not received operational roles, and cannot manage businesses independently; (2). Despite efforts to realize ideal institutions, tourism institutions, such as tourism awareness groups and tourism village managers, have not yet implemented administrative procedures, lack transparency, and have no work programs; (3) Despite efforts to build quality ecosystems, mitigation systems are not yet sufficiently robust and water availability is inadequate; (4) Despite waste management efforts, plastic elements are still utilized in food and beverage packaging; (5). Despite efforts to increase tourist attractions, culinary processing using local raw materials remains minimal.

Based on the AMOEBA diagram, small pseudopodia are reaching with a rating value of 4, signifying a less sustainable status, namely indicators for long-term activities impacting density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Limited human resources and capital in tourism management are among the obstacles to securing adequate water supplies and mitigation systems. Therefore, it is crucial for all stakeholders to actively collaborate and take decisive steps to accelerate sustainable tourism management.

Pseudopodia with extensive reach maintain a rating value of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), possess unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and exhibit archipelago-based natural beauty potential (SI28). Women in Sumba have ample opportunity to play an active role in women's organizations; namely, as administrators in organizations for family empowerment and welfare. Sumba women play an important role as preservers of Sumba's cultural heritage, as weavers of traditional fabrics. For the most part, women use weaving to generate income and improve their families' economic situation. The AMOEBA diagram is a tool for assessing the sustainability of community indicators by measuring their relative strengths and weaknesses. Based on this diagram, small pseudopodia reached a ranking value of 4, indicating a less sustainable status, namely indicators of long-term activities that affect density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Pseudopodia with a wide

reach maintain a rating of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), have unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and demonstrate the potential for archipelago-based natural beauty (SI28).

#### *4.4. Sustainable Tourism in East Sumba Archipelago Through Women's Empowerment*

Women's empowerment in realizing tourism in East Sumba is achieved through active participation in CBT management, from planning to monitoring. Women's involvement in CBT management in East Sumba remains limited and has not had a significant impact on families' or society's economic development. Optimization of women's empowerment is expected to reduce the still-elevated stunting rates on East Sumba Island. CBT represents a tourism development pattern that emphasizes local community empowerment to improve their economies through tourism business management (Steinicke & Neuburger, 2012). Empowering East Sumba communities, especially women, is fundamental to evaluating the achievements of tourism development. The most crucial empowerment component is empowered human resources, effectively managed to achieve development objectives (Abdullah et al., 2022). Women's empowerment becomes a strategic issue in East Sumba because it supports long-term, significant relationships with poverty alleviation and the reduction in stunting rates. This assertion aligns with Adnyani and Purnamawati's (2024) research, which states that women's roles in indigenous communities in managing Balinese cultural tourism impact family economic resilience. Women in Bali fulfill dual roles by actively participating in various tourism businesses without abandoning family responsibilities.

Women's empowerment in the East Nusa Tenggara region faces various obstacles, including limited capital, unequal employment opportunities, and social gender stereotypes. However, there are significant opportunities for women to increase their participation in the tourism industry, potentially improving their welfare. Implementing inclusive tourism in the East Nusa Tenggara region can generate economic benefits for local communities.

#### *4.5. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago*

East Sumba, as an archipelagic region, possesses tourism potential that could serve as an economic driver. Island potential packaged as tourism packages in CBT management can improve family economic independence. Sustainable tourism plays a role in poverty alleviation by emphasizing several factors, including environmental factors (Neto, 2003), social factors, and political factors (Hall & Page, 2009). PPT can serve as an effective poverty alleviation tool and supports tentative steps to realize its potential. PPT implementation using sustainable development approaches, through stakeholder involvement in corporate social responsibility, significantly impacts poverty alleviation (Diego et al., 2016).

Low PPT implementation in the business sector hinders tourism from fulfilling its role effectively, leading to stagnation and failure. Business sector involvement through CSR programs provides internal and external company benefits that impact economic, socio-cultural, and environmental aspects. Internal benefits include building reputation and business sustainability through improved company image and customer loyalty. External benefits include sustainable development as corporate social responsibility toward broader society (Diego et al., 2016). CSR's role in tourism development on East Sumba Island remains relatively modest. One CSR entity involved in tourism management on East Sumba Island, SMI, is an Indonesian State-Owned Enterprise operating in infrastructure financing. SMI's CSR program supports sustainable tourism development in Watuhadang Village by enhancing the quality of creative economy

products in the weaving and culinary sectors, improving restroom facilities, and increasing water availability through borehole construction. PT SMI constructed UV-curing equipment for weaving craftspeople to accelerate drying during the production of woven fabrics. UV Curing availability significantly helps craftspeople improve product quality and quantity. Food court construction enables the optimization of women's empowerment in the culinary sector, from raw material processing and planning to product marketing. Meanwhile, borehole construction promotes ecosystem quality by ensuring adequate water availability to support tourism activities. Access to clean water is a key issue in the East Sumba region, which is highly vulnerable to drought disasters.

CSR programs that can contribute positively to poverty alleviation possess several characteristics: suitability for impoverished rural areas; labor-intensive approaches; empowerment of women and communities representing economically disadvantaged populations; and encouragement of tourism activities that create business opportunities (Spenceley & Meyer, 2012). CSR describes a multifaceted concept encompassing four categories of community expectations (Carroll, 2017): (1) economic expectations (i.e., companies should be profitable), (2) legal expectations (i.e., companies should operate within legal boundaries), (3) ethical expectations (i.e., business operations should meet specific ethical standards not required by law), and (4) philanthropic or discretionary expectations (i.e., companies should voluntarily contribute to addressing social needs, including poverty alleviation). CSR activities are voluntary, so companies bear consequences for their ethical or philanthropic responsibilities (Inoue & Lee, 2011). CSR maintains a substantial role in poverty alleviation through 'pro-poor CSR' programs. Pro-poor CSR encompasses several key initiatives, including poverty reduction, fostering relationships with local suppliers and informal sectors, promoting sustainable tourism practices, and preserving the natural environment of economically disadvantaged communities. Companies can collaborate with secondary stakeholders such as NGOs, government institutions, and international organizations (Smith & Ong, 2015).

## 5. Conclusions

Women represent a significant potential resource in East Sumba, given their considerable numbers and their status as unpaid family workers. Women's empowerment in East Sumba becomes a strategic issue due to cultural traditions and persistently strong patriarchal perspectives (Swari, 2023). Women play crucial roles in achieving family economic independence and reducing stunting rates through their involvement in tourism businesses. Tourism empowerment is measured through sustainable tourism approaches that encompass two inseparable systems: the human system and the ecosystem. The human system encompasses four key dimensions: political, economic, social, and production structure.

In contrast, the ecosystem comprises Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Each dimension contains four indicators, resulting in 32 indicators for measuring tourism sustainability levels in East Sumba. Based on scoring results for 32 indicators, tourism in East Sumba falls within the potentially sustainable category, with opportunities for sustainability through adjustments and strengthening several indicators. This research provides strategic recommendations to advance sustainable tourism, focusing on inclusive tourism through women's empowerment, the creation of thematic, integrated archipelago-based tourism packages, the establishment of healthy CBT institutions, and the strengthening of Pentahelix cooperation.

The theoretical implication of this research is to enrich references on women's empowerment in island tourism areas. The references offer concepts of inclusive and pro-poor tourism management. Island tourism areas have unique and vulnerable

characteristics, so this study is expected to provide strategic references. In practical terms, this study provides an overview of the sustainability of tourism developed in the Sumba Island tourism area through women's empowerment. The existing conditions serve as a reference for relevant stakeholders to formulate plans for Sumba women's participation in supporting sustainable tourism management.

This study offers several recommendations for women's empowerment in CBT across the archipelago. The implication of this research is to provide a broader understanding for various stakeholders, especially women, thereby increasing their involvement in the tourism industry. The active participation of women in the tourism business specifically increases family economic independence and, more generally, influences the financial movement of local communities in East Sumba Regency. Family economic independence in the short- and medium-term can significantly reduce stunting rates.

This research has limitations in geographic coverage, making it difficult for researchers to reach all tourist villages in East Sumba Regency. East Sumba Regency has 14 tourist villages that are relatively far apart, and internet access is limited, which poses an obstacle to data collection. Researchers need time and effort to obtain representative data. The research involved only two systems—namely, the Human System and the Ecosystem, each comprising eight dimensions and 32 indicators. Future research is expected to reach 14 tourist villages in East Sumba Regency. The research dimension can be enriched by including other under-researched areas, such as sociopreneurship and investment in CBT development.

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## Abbreviations

The following abbreviations are used in this manuscript:

CBT	Community-Based Tourism
PPT	Pro-Poor Tourism
CSR	Corporate Social Responsibility
BTS	Barometer of Tourism Sustainability
ATSI	AMOEBAs of Tourism Sustainability Indicators
SI	Sustainability Indicator
SMI	Sarana Multi Infrastruktur
UBSI	Universitas Bina Sarana Informatika

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**No. 11**

**BUKTI KONFIRMASI  
PENGECEKAN TERAKHIR/  
*FINAL VERSION CHECK*  
(2 Desember 2025)**

The screenshot shows a Gmail interface with a dark sidebar on the left. The main content area displays an email from Eulalia Zhang. The email title is "[Economics] Manuscript ID: economics-3946451 - Final Version Check". The sender is Eulalia Zhang, Assistant Editor at MDPI. The email body contains a message of acceptance for the manuscript and a request for confirmation of the final version. The sidebar on the left shows various folders and labels, including 'Kotak Masuk' (8,997), 'Draf' (59), 'Sosial' (764), 'Info Terbaru' (2,640), 'Forum' (101), and 'Promosi' (3,492).

**Navigation:** Hamburger menu, Gmail logo, Search bar (economics), Filter icons, Status (Aktif), Profile picture.

**Sidebar (Left):**

- Mail (99+)
- Chat
- Meet
- Kotak Masuk (8.997)
- Berbintang
- Ditunda
- Penting
- Terkirim
- Draf (59)
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## Article

# A Sustainable Development Approach to Women's Empowerment for Increased Household Economic Independence: Pro-Poor Tourism Concept in an Archipelago Area

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## Abstract

Community-Based Tourism (CBT) in East Sumba highlights its unique natural features through its archipelagic potential, which is synergistically integrated with rich traditional cultural experiences. Island-based CBT faces strategic management challenges, especially in empowering human resources—notably women—amid the inherently vulnerable and fragile nature of island tourism assets. Women's empowerment, a key element of pro-poor tourism, significantly influences poverty reduction and helps address the high rates of stunting in East Sumba. This research aims to examine women's empowerment within archipelago-based CBT management frameworks that impact household economic independence. The study adopts a sustainable tourism approach that involves two systems—the human system and the ecosystem—broken down into four dimensions and 32 indicators to assess the sustainability potential of each. Data analysis uses scoring methods to produce BTS and ATSI diagrams. Findings indicate that CBT in East Sumba falls within the potentially sustainable quadrant on the BTS diagram, with coordinates (6.88, 6.49). The average scores are 7.0 for the human system and 6.44 for the ecosystem, supported by the AMOEBA diagram, which shows broad tendencies. The most critical and vulnerable sustainability indicators include ecosystem integrity—particularly access to clean water—and effective mitigation strategies. Conversely, the indicators with the highest robustness include active women's participation in Family Empowerment and Welfare Organizations and tourism diversification, which is enhanced by East Sumba's strategic location within Indonesia's eastern tourism corridor. Stakeholders can leverage these findings by promoting women's empowerment through integrated tourism package innovations, thereby creating more entrepreneurial opportunities and improving household economic conditions. This research contributes to understanding women's empowerment through sustainable tourism methods, emphasizing its role as a foundation for pro-poor tourism within island-based CBT frameworks.

**Keywords:** women's empowerment; CBT; pro-poor tourism; archipelago tourism; household economic; human system; ecosystem



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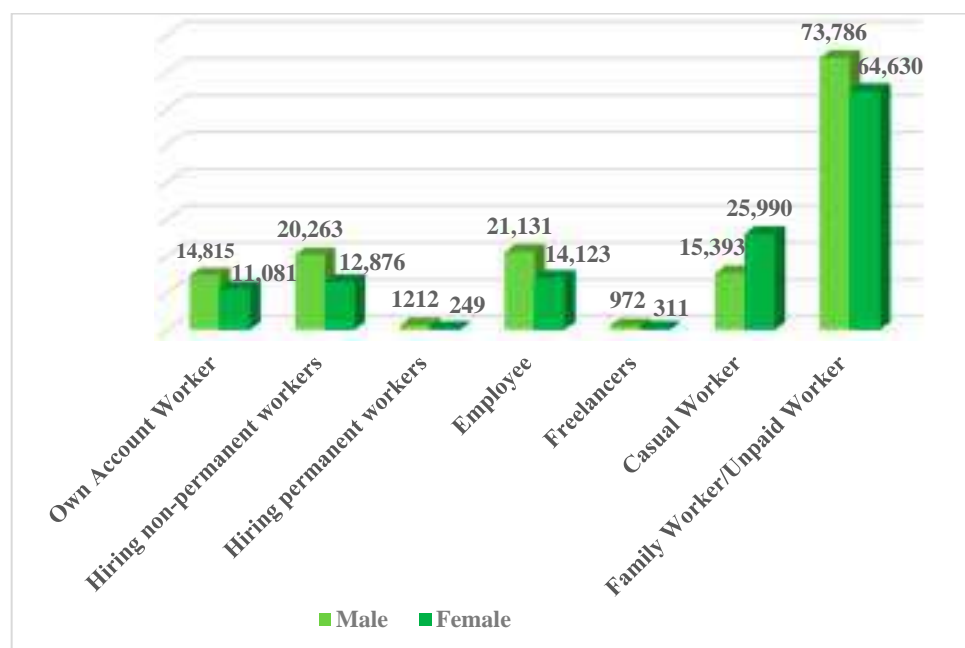
## 1. Introduction

East Sumba is a regency on Sumba Island, East Nusa Tenggara Province, Indonesia. In 2020, East Sumba Regency was classified as a disadvantaged region under Presiden-

tial Regulation No. 63 of 2020. Four years later, in 2024, it was successfully ranked as a developing region based on a decrease in the poverty rate, one of the critical indicators. According to data from the [Central Statistics Agency of East Sumba \(2025\)](#), the poverty rates for 2020, 2021, 2022, and 2023 were 29.65%, 29.68%, 28.22%, and 28.08%, respectively. Beyond these socioeconomic shifts, archipelagic destinations have unique opportunities to develop a strong identity and become resilient in the face of future crises ([Figueroa & Rotarou, 2021](#)). East Sumba Island, with its unique cultural heritage, has high potential for development as a tourist destination to boost its economy and reduce poverty. This potential is further highlighted by the regency's growing tourist appeal, as evident in the increase in foreign and domestic tourists from 2021 to 2023. The number of international tourist visits from 2021 to 2023 was 87 (2021), 813 (2022), and 2121 (2023). Meanwhile, the number of domestic tourist visits was 18,489 (2021), 34,083 (2022), and 50,635 (2023).

The management of island-based tourism potential faces several obstacles, including inadequate infrastructure, limited human resource capacity, weak planning, low local community participation, and a lack of collaboration ([Nashrullah et al., 2025](#)). Island tourism plays a vital role in maritime economic development ([Mo & Qi, 2023](#)), thereby requiring strategies to enhance competitiveness by empowering local communities. Developing sustainable ecotourism service systems is essential for islands that are more vulnerable and easily affected ([Hsiao et al., 2021](#)). The key component of marine ecotourism service systems is management capacity for mitigation, with ecological diversity serving as a core resource. Local communities work with stakeholders to build ecotourism systems that support conservation sustainability and increase tourist satisfaction ([Hsiao et al., 2021](#)). Management of the island focuses on personalized, nature-based experiences to promote sustainable tourism that benefits the local community economy ([Figueroa & Rotarou, 2021](#)). Sustainable tourism management requires an inclusive approach to institutional strengthening and community empowerment. Strengthening community empowerment involves investing in human resource capacity-building, participatory planning, and collaboration among tourism stakeholders to support long-term community welfare ([Nashrullah et al., 2025](#)). Efforts to promote sustainable island tourism often focus on cultural enhancement to attract visitors ([Ge, 2020](#)).

Managing island tourism through local community empowerment is a concept of pro-poor tourism (PPT) ([Yang et al., 2021](#)). PPT has developed since the early 2000s as a concept of sustainable tourism development through local community empowerment. Sustainable island tourism management can drive economic and social transformation ([Cao et al., 2021](#)). PPT can reduce poverty ([Çolak et al., 2023](#)) and have an impact on the environment and society through cooperation between various stakeholders ([Wen et al., 2021](#)). The implementation of PPT without involving the business sector has led to ineffectiveness, stagnation, and the failure of tourism businesses. CSR programs are one form of collaboration to realize PPT, which can harmonize cultural preservation and economic interests to realize sustainable tourism through various innovative initiatives ([Wu et al., 2023](#)). The PPT program is implemented through a social innovation approach and the strengthening of traditions to encourage the transformation of community power structures ([Hazenbergh et al., 2025](#)). Based on East Sumba statistics for 2024, women's empowerment remains comparatively limited. The majority of women in East Sumba are homemakers without income-generating activities (family workers or unpaid laborers), totaling 64,630, due to restricted opportunities for active participation in industrial sectors ([Central Statistics Agency of East Sumba, 2025](#)). This data demonstrates that most women remain unproductive and unable to contribute to the family's economic reinforcement. Productive-age population statistics are presented in [Figure 1](#).



**Figure 1.** Population 15 Years and Over who Worked During the Previous Week by Main Employment Status and Sex in East Sumba Regency, 2023. Source: (Central Statistics Agency of East Sumba, 2025).

Women's empowerment in East Sumba remains relatively limited due to two main factors: patriarchal norms and educational levels. In some aspects of social life in East Sumba, men still serve as the primary decision-makers in families and communities across various areas of life. Meanwhile, women are seen as holding subordinate roles and are more vulnerable to different forms of violence. Educational attainment in East Sumba is mainly at the primary school level. In 2022 and 2023, it was reported that over 98% of individuals had completed primary education (Central Statistics Agency of East Sumba, 2025). Women's empowerment in East Sumba aims to improve family welfare, thereby helping to lower the persistently high stunting rate, which averaged 15% from 2021 to 2024 (Central Statistics Agency of East Nusa Tenggara Province, 2025). This rate exceeds the government target of below 14%. Women's empowerment through pro-poor tourism management grounded in archipelagic traits is a strategic option for boosting family economics and overall societal conditions.

Sustainable tourism promotes equitable tourism by empowering women in many domains (Jamal & Higham, 2021). Eco-feminist paradigms for eco-cultural justice (Camargo et al., 2016) and feminist epistemological views (Eger et al., 2022) also support women's empowerment. Women's empowerment is key to successful tourism development and to long-term poverty reduction. Examples include Balinese women in indigenous communities. They actively participate in tourism, supporting family resilience while still fulfilling family duties (Adnyani & Purnamawati, 2024). Gender inequality has become a global concern, acting as a barrier to women's empowerment in tourism development. Women are more likely to have insecure jobs, earn less, and have fewer career opportunities (Nanthini & Nair, 2020). Gender inequality began with physical differences; however, it evolved due to social, historical, and cultural factors (Jule, 2014), such as patriarchal restrictions for Arab women (Zuhur, 2003) and Confucian traditions in China (Hao et al., 2021). Gender inequalities block truly sustainable human development, and understanding gender in local contexts is needed. Achieving gender equality helps business development, service quality, and customer satisfaction (Wan & Chan, 2018). Women's empowerment can help

reduce vulnerability and boost resilience and sustainability in the face of global climate and pandemic crises (Kalisch & Cole, 2023).

Sustainable tourism management through the concept of empowerment involves two systems as key indicators; namely, the human system and the ecosystem (Ko, 2005). Human system indicators include politics, economics, socio-culture, and production structures, while ecosystem indicators include environmental impact, ecosystem quality, biodiversity, and environmental policy and management. The presence of women within the human system plays an essential role in realizing sustainable tourism. The tourism industry offers opportunities for women to take on roles within organizational hierarchies (Vujko et al., 2024), contribute innovative ideas or frameworks (McCall & Mearns, 2021), and participate in tourism development planning (Rahmawati & Darwis, 2023). Women's active involvement in tourism-related organizations mainly remains limited to women's groups, such as Family Empowerment and Welfare (Wirdawati et al., 2024).

The achievement of sustainable tourism is shown through economic impacts, especially the creation of entrepreneurial opportunities and the growth of local community economies. Women's empowerment is realized through active involvement in various tourism businesses (McCall & Mearns, 2021), opening doors to start independent businesses (Wardhani & Susilowati, 2021), which in turn leads to increased income (I. Idris et al., 2023; Vukovic et al., 2023), thus supporting household economic independence (Borović et al., 2022). From a social perspective, sustainable tourism creates opportunities for women to participate socially through various tourism industries (Rahmawati & Darwis, 2023). Active involvement in tourism boosts women's self-confidence (Hao et al., 2021), promotes gender equality (Ghimire et al., 2024), raises awareness of the importance of self-development and future generations (Pécot et al., 2024), and fosters increased pride (Rasoolimanesh et al., 2017). Sustainable tourism promotes optimal tourist satisfaction through strengthening service and product quality standards. Tourist experiences are shaped by complex interactions that can encourage tourists to revisit destinations. Sustainable tourism can include products created from environmentally sustainable raw materials, promote environmental and cultural conservation through infrastructure development (El-Manhaly & Taha, 2024), and build on adequate skills and knowledge from local communities (Pécot et al., 2024).

Tourism management produces both positive and negative effects (Butler et al., 2022). The positive aspects of tourism businesses include raising awareness of the importance of protecting the environment and culture. On the other hand, long-term adverse effects can consist of conflicts among local communities (Simpson, 2008), increased waste, and traffic congestion (Pearce & Chen, 2012). Sustainable tourism should create healthy ecosystems, including sufficient water resources, suitable land for tourism activities, and clean air (Yin et al., 2022), as well as the adoption of tourism mitigation strategies (Afifa & Nugroho, 2022). Sustainable tourism is closely linked to tourism diversification (O'Halloran, 2020), which includes traditional cultural uniqueness, handcrafted crafts and culinary arts, and natural attractions found on islands (Mrđa & Carić, 2019). Sustainable tourism involves establishing strong institutions that operate efficiently, uphold development programs and policies regulating tourism growth, and foster effective collaboration with various stakeholders (Kapera, 2018).

The Global Sustainable Tourism Development Council (GSTC) states that sustainable tourism applies four pillars: environmental, economic, social, cultural, and management. Implementing these four pillars benefits local communities and improves destination quality (Borland & Lindgreen, 2013). The conceptualization of sustainable tourism through four pillars is realized through stakeholder synchronization and training programs (Hizmi & Junaid, 2023), which are key to successful sustainable development (Ju-

naid et al., 2022). Tourism environment, as the foundation of sustainable tourism development, encompasses the natural, economic, and social and cultural environments (Ge, 2020). Sustainable tourism development influences environmental conservation, economic development, and social progress (Hernández-Cuevas et al., 2024).

This research examines women's empowerment in island-based CBT located in East Sumba Regency, East Nusa Tenggara. Archipelago tourism has characteristics distinct from those of urban or rural tourism and is more vulnerable to environmental degradation. The findings offer an overview of current conditions related to women's empowerment through CBT management, which influences family economic improvement. CBT, as a model of sustainable tourism, plays a crucial role for both impoverished and non-impoverished households and helps reduce poverty by empowering communities through tourism enterprises (Thomas, 2025). The study provides strategic recommendations for reducing poverty through women's empowerment in tourism businesses, supporting household economic growth and independence. The implications include reconceptualizing women's empowerment in light of the study's findings. The research adds new insights by focusing on women's empowerment in island-based tourism areas to help reduce poverty and promote sustainable tourism goals.

Previous research has examined women's empowerment in CBT (McCall & Mearns, 2021; P. A. Idris & Rahmawati, 2021; El-Manhaly & Taha, 2024), pro-poor tourism (Yang et al., 2021), and archipelago-based tourism (Lewis-Cameron & Brown-Williams, 2022; Figueroa & Rotarou, 2021; Hsiao et al., 2021) in fragmented approaches. This research integrates three tourism management variables, which are assessed using a sustainable tourism methodology—first, women's empowerment as SDG 5: Gender Equality. Second, archipelagic regions are key components of marine tourism, serving as primary attractions in Indonesia, as an archipelagic nation; island tourism offers unique potential but also involves fragile and easily compromised characteristics, which require effective and efficient management strategies. Third, pro-poor tourism as SDG 1: No Poverty. Strategies for poverty alleviation are a strategic concern in eastern Indonesian regions, including East Nusa Tenggara.

## 2. Methodology

### 2.1. Research Design

The research design adopts a descriptive quantitative methodology with a focus on sustainable tourism. The quantitative approach is used to measure indicators of sustainable tourism assessment, covering two systems: the Human System and the Ecosystem. Primary data is collected through observation and interviews to determine scores, while secondary data is obtained from third-party sources, both online and offline. Primary data was collected through Focus Group Discussion (FGD) using survey and interview methods from June to August 2025. The FGD was conducted with approval from the East Sumba Regency Government, dated 10 June 2025, which authorized the Tourism and Culture Office to facilitate the availability of key respondents and informants for data collection. Participants in primary data collection include women involved in tourism management, tourism village managers, tourism awareness groups, village officials, and other relevant stakeholders. Secondary data from third parties was obtained from the tourism office, the central statistics agency, and stakeholders involved in CBT management, including CBT management documents, tourism development programs, and related data. Secondary data was collected over a period of five months, from April to August 2025. The study was carried out in eight tourism villages in East Sumba, located from east to southeast: Kalituda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Lambanapu, and Prailiu. Village selection was based on their characteristics as cultural tourism sites with significant poten-

tial for women's empowerment. The village groups involved in the research are referred to as society.

## 2.2. Data Analysis Techniques

The data analysis technique employs the Barometer of Tourism Sustainability (BTS) and AMOEBA of Tourism Sustainability Indicators (ATSI) methodologies. BTS elucidates the comprehensive sustainability level of human systems and ecosystems (Prescott-Allen, 1997). The sustainability barometer presents a systematic approach to measuring and communicating community welfare and progress toward sustainable development, producing conclusions about human systems and ecosystem conditions, and the effects of human interaction with ecosystems. The BTS methodology provides researchers with the opportunity to select their own indicators to measure humans and ecosystems as an integrated system and to assess the entire system and its components (Guijt et al., 2001). The system barometer presents the sustainability of tourism management in five ratings. These ratings are measured on a score range: Unsustainable Tourism ( $0 \geq X > 2$ ), Potentially Unsustainable Tourism ( $2 \geq X > 4$ ), Intermediate ( $4 \geq X > 6$ ), Potentially Sustainable Tourism ( $6 \geq X > 8$ ), and Sustainable Tourism ( $8 \geq X \leq 10$ ). The barometer also presents the coordinates of measurement results for 32 indicators that describe the sustainability status of tourism management. AMOEBA of Tourism Sustainability Indicators (ATSI) explains the sustainability level of these tourism indicators (Bell & Morse, 1999; Ten et al., 1991). ATSI is the result of measurements from 32 indicators. It is presented in the AMOEBA visualization, which illustrates the level of sustainability: the wider the AMOEBA, the stronger the sustainability. The ATSI visualization design uses a radar chart created in Excel.

BTS and ATSI analysis techniques provide a visual overview of the sustainability conditions of tourism management in a geographical area (Ko, 2005). The BTS and ATSI analysis stages comprise several phases: determining the community; identifying the system, dimensions, and indicators; determining the indicator weights and scales; calculating indicator scores; and presenting the results in visual form. The research employs 32 indicators to measure tourism sustainability, referred to as Sustainable Indicators (SI). Research indicators are derived from dimensions that constitute derivatives of two sustainable tourism systems: the human system and the ecosystem. The human system encompasses four dimensions: political, economic, social, and production structure. Ecosystem encompasses four dimensions: environmental impact, ecosystem quality, tourism diversity, and Environmental Policy and Management. Indicators are assessed using a 10-point rating scale technique to measure sustainable tourism phenomena in East Sumba Regency. Ratings are interpreted into five rating categories: ratings 1–2 are assessed as highly unsustainable, ratings 2–4 are evaluated as less sustainable, rating 5 is estimated as neutral, ratings 6–7 are evaluated as potentially sustainable, and ratings 8–10 are assessed as highly sustainable (Sugiyono, 2020). Each indicator is assigned a weighting based on its contribution to the system being measured. The measurement results from 32 indicators, obtained through the rating process, are entered into a table and multiplied by their respective weights to produce a score. The total score for each system produces coordinates that are presented on the Barometer graph, while the rating values are presented in the AMOEBA visualization. Research indicators are formulated based on relevant theoretical foundations, as presented in Table 1.

**Table 1.** Sustainable Indicators (SI).

Society			
Traditional Villages in East Sumba: Kaliuda, Lainjanji, Rindi, Watuhadang, Mondu, Maulumbi, Prailiu, Lambanapu			
System	Dimension	Indicators	
The Human System	Politic	SI1	Women occupy strategic positions in organizational management (Vujko et al., 2024)
		SI2	Women have opportunities to express their opinions (McCall & Mearns, 2021)
		SI3	Women participate in tourism development planning (Rahmawati & Darwis, 2023)
		SI4	Women develop women's institutions, such as the Family Welfare Movement (Wirdawati et al., 2024)
	Economic	SI5	Women are actively involved in various tourism business sectors (El-Manhaly & Taha, 2024)
		SI6	Women have opportunities to establish independent businesses in the tourism sector (Wardhani & Susilowati, 2021)
		SI7	Women generate income from tourism to strengthen the economy (Borović et al., 2022)
		SI8	Women experience increased economic independence (Rahmawati & Darwis, 2023)
	Social Dimension	SI9	Women gain self-confidence through tourism involvement (Vujko et al., 2024)
		SI10	Women have opportunities to socialize through tourism businesses (El-Manhaly & Taha, 2024)
		SI11	Women achieve gender equality through the tourism business (Ghimire et al., 2024)
		SI12	Women possess awareness for self-development and future generations (Pécot et al., 2024)
	Production Structure	SI13	Women process environmentally friendly raw materials (El-Manhaly & Taha, 2024)
		SI14	Women play active roles in environmental and cultural conservation (Butler et al., 2022)
		SI15	Women are actively involved in local infrastructure management (El-Manhaly & Taha, 2024)
		SI16	Women possess adequate skills and knowledge (Wirdawati et al., 2024)
The Ecosystem	Environmental Impacts (Butler et al., 2022)	SI17	Fostering awareness to participate in environmental conservation actively
		SI18	Long-term activities impact population density and congestion.
		SI19	Tourism activities potentially generate waste from tourism-related activities.
		SI20	Tourism management potentially triggers conflicts among local communities.
	Ecosystem Quality (Yin et al., 2022)	SI21	Community-Based Tourism (CBT) has adequate water resources
		SI22	CBT has adequate and representative land for the tourism business
		SI23	CBT maintains clean air quality that poses no risk to human health
		SI24	CBT implements tourism mitigation programs
	Tourism diversity (Afifa & Nugroho, 2022)	SI25	CBT possesses a unique traditional culture
		SI26	CBT produces distinctive handicrafts
		SI27	CBT offers distinctive cuisine
		SI28	CBT features natural beauty based on archipelagic characteristics
Environmental Policy and Management (Kapera, 2018)	SI29	CBT maintains healthy governance and executes its functions and responsibilities	
	SI30	CBT implements sustainable tourism development programs	
	SI31	CBT establishes policies that regulate development	
	SI32	CBT maintains extensive cooperation with various stakeholders	

Source: developed from Ko (2005).

### 3. Results

#### 3.1. General Overview of CBT in East Sumba

The research utilizes eight CBTs, including Mondu, Lambanapu, Malumbi, Prailiu, Watuhadang, Rindi, Kaliuda, and Lainjanji. Mondu Village is located in Kanatang District

and covers 90.45 km<sup>2</sup>. The tourism potential of Mondu Village includes savanna landscapes, Mangejing ritual culture, Padadita traditional village, Tanggedu waterfall, Kapihak Beach, and a creative economy through weaving, lontar leaf handicrafts, and statue carving. The population of Mondu Village is 1596, primarily engaged in farming, livestock breeding, and fishing. Lambanapu Village is situated in Kambara District, covering 795 hectares, with a population of 3191. The area is mainly rice fields and agricultural land, so most residents work in farming. Its tourism attractions include the Kambaniru River, the Lambanapu archeological site, the cultural house, weaving, the Tanau and Seribu hills, the Ori Angu Dance Studio, and the Li Luri Studio. Both Mondu and Lambanapu villages are vulnerable to flood disasters. Malumbi Village, located in East Wewewa District, spans 11.2 km<sup>2</sup> with 2467 residents, mostly farmers and artisans. Its tourism potential includes the Kambaniru River and Dam, herbal hills, weaving, betel nut processing sites, and bamboo crafts. Prailiu Village is in Kahaungu Eti District, covering 51 hectares and home to 7874 residents who work as farmers and artisans. Attractions include Prailiu Village, Hamayang (Traditional Ritual), Parunggara tour (Guest Welcome), Hambu marata (bride welcomed in the village of origin), Puru la kamaidu (harvest ceremony), Palupang Djara (Horse Racing), megalithic stones, mangrove tourism, Batu Payung Beach, traditional dance, ikat weaving crafts, and specialty foods like Manggulu, kaparak, instant ginger beverages, and moringa biscuits. Watuhadang Village, in Umalulu District, covers 1020 hectares and has 2954 residents engaged in farming, livestock breeding, and weaving. Its tourism potential includes traditional villages, megalithic graves, traditional houses, pahikung weaving, savanna hills, and the kendingan dance. Watuhadang is relatively safe from natural disasters. Rindi Village, in Rindi District, covers 57 km<sup>2</sup> and has 1702 residents, mainly farmers, livestock breeders, and fishermen. Its attractions consist of noble graves, the tarik bati tradition, the Praiyawang traditional village, and stone carving crafts. The town faces risks from floods and storms. Kaliuda Village, in Pahunga Lodu District, spans 110 hectares and is home to 4238 residents engaged in farming, fishing, livestock breeding, and artisan work. Its tourism appeals include ancestral culture on woven fabrics and Prianu customs, Marapu traditional funeral rituals, megalithic graves, weaving crafts, seaweed farming, the Nalu and Kanggoa Rivers, the Prianu traditional village, Tandening savanna grassland (the longest savanna), and traditional dance. Kaliuda is vulnerable to natural hazards, including floods, tsunamis, and earthquakes. Lainjanji Village, in Wulla Waijilu District, covers 97.2 km<sup>2</sup> with 1500 residents, who mainly work as farmers, plantation workers, and fishermen. The area's attractions include coastal flows and savanna grasslands. The tourism potential consists of the Lainjanji River, Woranu River, Praibakal River, Watuparunu Beach, hot springs, ikat weaving, and seaweed farming.

The selection of these eight CBTs was based on regional characteristics and potential, specifically traditional cultural assets, weaving crafts, and natural resources from the archipelago. Villages known for weaving have significant potential to empower women because most weaving artisans are women. These eight CBTs pose challenges to women's empowerment in tourism management, potentially affecting their families' economic independence. Based on data collected through observation, interviews, and documentation, the assessments of 32 indicators are shown in Table 2.

Table 2 shows the results of sustainable tourism measurements using human systems and ecosystems, covering eight subsystems. The rating value presents measurement results for 32 weighted indicators. The score is calculated by multiplying the weighted value by the rating value. In Table 2, column 1 lists a rating of 6 for the sustainable indicator (SII). The score of 0.5 is the product of the weighted value and the rating value. The total indicator score for the human system is the X-coordinate value. The total score for the ecosystem indicator is the Y-coordinate value, representing the sustainable condition in the Barom-

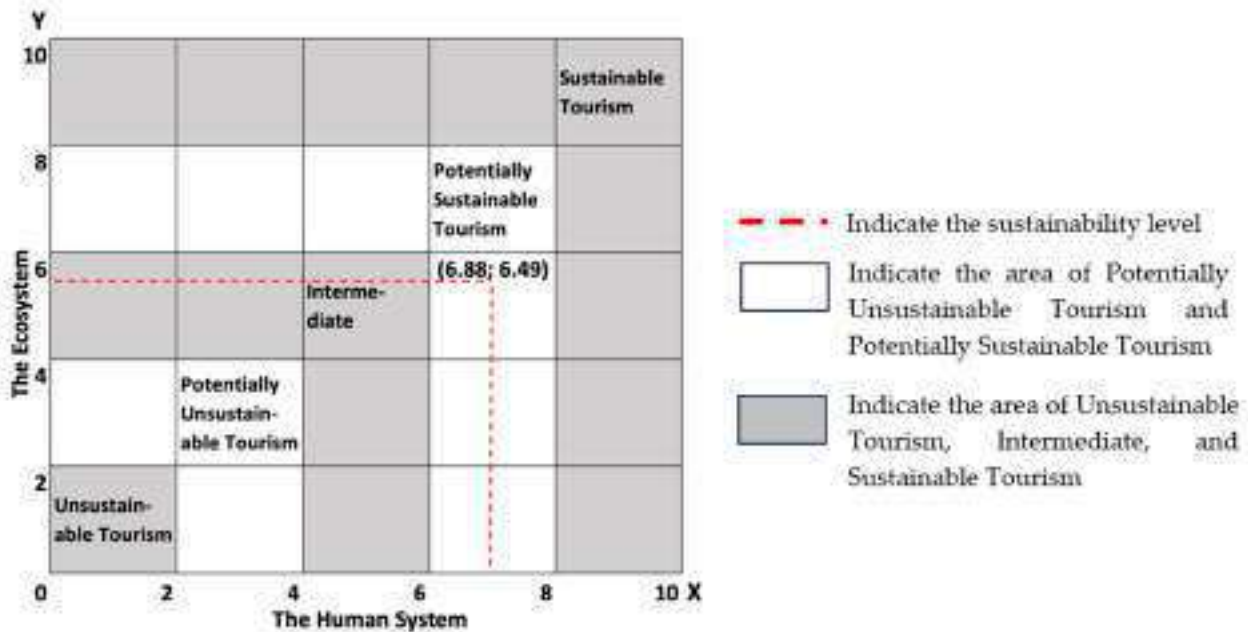
eter graph. The rating value also shows the sustainable condition for each indicator, as presented in the AMOEBA visualization.

**Table 2.** Sustainable Indicator (SI) Assessment.

System	Dimension	Indicator	Weight	Rating	Score	System	Dimension	Indicator	Weight	Rating	Score
(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
The Human System	Politic	SI1	0.08	6.00	0.50	The Ecosystem	Environmental Impacts	SI17	0.07	7.00	0.51
		SI2	0.06	8.00	0.44			SI18	0.02	4.00	0.10
		SI3	0.06	6.00	0.33			SI19	0.07	6.00	0.44
		SI4	0.03	9.00	0.25			SI20	0.05	6.00	0.29
	Economic	SI5	0.08	7.00	0.58		Ecosystem Quality	SI21	0.07	4.00	0.29
		SI6	0.03	7.00	0.19			SI22	0.07	6.00	0.44
		SI7	0.08	6.00	0.50			SI23	0.05	7.00	0.34
		SI8	0.08	6.00	0.50			SI24	0.07	4.00	0.29
	Social	SI9	0.06	7.00	0.39		Tourism diversity	SI25	0.07	9.00	0.66
		SI10	0.06	8.00	0.44			SI26	0.07	9.00	0.66
		SI11	0.08	8.00	0.67			SI27	0.07	6.00	0.44
		SI12	0.06	7.00	0.39			SI28	0.05	9.00	0.44
	Production Structure	SI13	0.08	8.00	0.67		Environmental Policy and Management	SI29	0.07	6.00	0.44
		SI14	0.06	8.00	0.44			SI30	0.05	6.00	0.29
		SI15	0.03	5.00	0.14			SI31	0.05	7.00	0.34
		SI16	0.07	6.00	0.44			SI32	0.07	7.00	0.51
$\bar{x} = 7$					$\Sigma = 6.88$	$\bar{x} = 6.44$					$\Sigma = 6.49$

3.2. Quadrant of Sustainability Levels

Based on scoring values in Table 2, the axis value (X; Y) is (6.88; 6.49), which is in the potentially sustainable quadrant, as shown in Figure 2. This quadrant highlights opportunities for sustainable CBT in East Sumba, emphasizing the balance between the Human System and Ecosystem with tourism pentahelix involvement.



**Figure 2.** Barometer of Tourism Sustainability (BTS).

3.3. Sustainability Indicators Value

Based on Table 2, the AMOEBA diagram in Figure 3 illustrates the level of tourism sustainability in East Sumba.

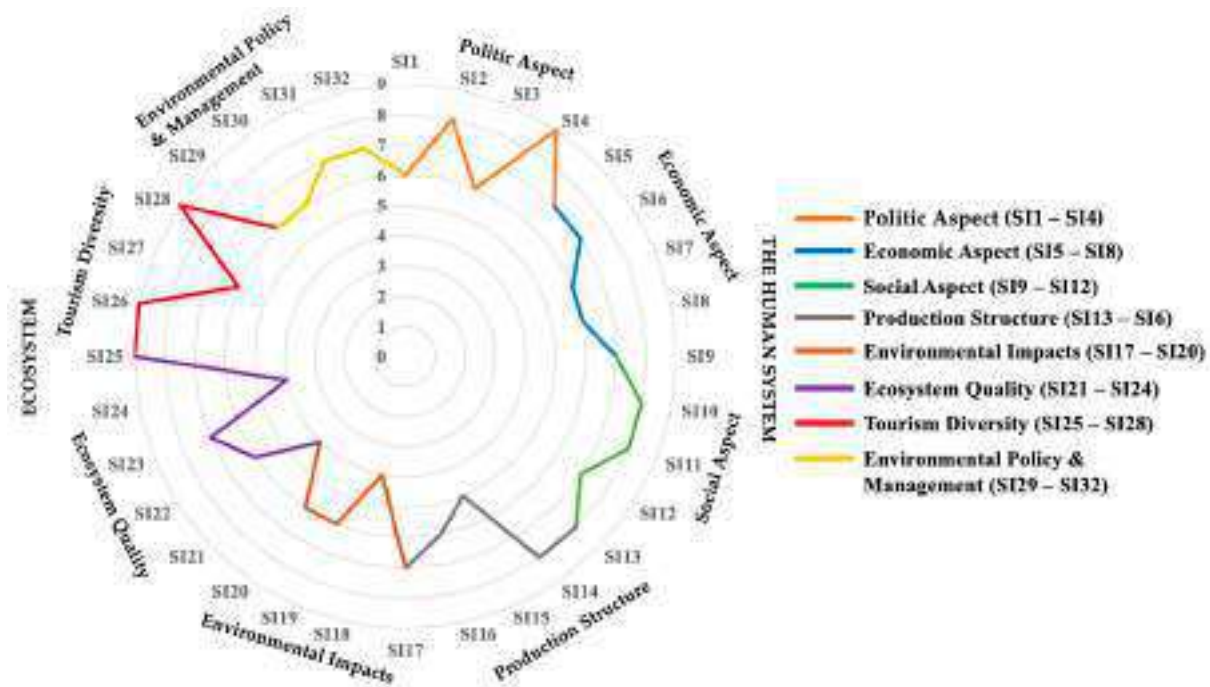


Figure 3. AMOEBA of Tourism Sustainability Indicator (ATSI).

The AMOEBA figure indicates potentially sustainable tourism development on East Sumba Island by its broad coverage. The extent of pseudopodia reflects the magnitude of indicator values: the wider the reach, the higher the value.

## 4. Discussion

### 4.1. Sustainability Level of the Human System in East Sumba Tourism

The human system in sustainable tourism comprises political, economic, social, and production dimensions. Table 2 shows that the average human system assessment is 7, indicating potentially sustainable conditions. However, the women's empowerment indicator in local infrastructure management (SI15) shows relatively low scores of 5. Women's involvement can be improved by making homestay management a central accommodation for CBT. Most CBTs have not provided homestays due to limited staff knowledge and skills, instead renting parts of residents' rooms for tourists. Existing homestays operate independently from residents' houses, resulting in little interaction between tourists and hosts (Wijayanti & Dewi, 2023). Women's empowerment has reached relatively optimal levels in several tourist destinations, such as Bali, Banyuwangi, Bantan, and Yogyakarta, where women play key roles as business managers, tourism promoters, and preservationists (Sirad et al., 2025).

The political aspect is assessed through women's participation in institutions directly and indirectly linked to the tourism industry. As seen in Table 2, the highest rating indicator is 9, indicating that women in East Sumba run an organizational forum through community-based groups focused on family empowerment, specifically the Family Welfare Movement (S14) (Wirdawati et al., 2024). However, women's involvement in tourism-related organizations remains limited, especially in Tourism Awareness Groups and Tourism Village Management bodies. The hierarchy within tourism organizations remains male-dominated, limiting women's roles in planning. Although women have opportunities to share their ideas and opinions verbally and in writing about tourism development (McCall & Mearns, 2021), the management process from planning to oversight is mainly carried out by men. Women's active participation in East Sumba's tourism growth

primarily focuses on tourism business activities, particularly in culinary services, the creative economy, and cultural preservation.

The dimensional indicator measurements shown in Table 2 indicate that while women's empowerment in the tourism industry has reached a sustainable level, its positive impact on economic growth remains limited. This limited impact is partly due to the lack of coordinated and comprehensive support. As a result, women's empowerment efforts remain scattered and do not effectively drive long-term economic development or sustainability. For example, although weaving is a common form of women's empowerment in East Sumba's CBT, the lack of integration across the production and marketing phases limits weavers' ability to increase their income and contribute to broader economic resilience.

Tourism development in East Sumba aims to drive economic growth and improve families' financial independence by empowering women. Women's participation is expected to stimulate tourism growth across the region. As of 2024, 64,630 women in East Sumba are housewives without income—51.94% of the female population and 25.29% of the total population. Women's involvement primarily remains in small-scale operations, with limited roles in starting independent enterprises, which is the main barrier to strengthening the family economy (Borović et al., 2022).

Culinary attractions in East Sumba remain limited in both quantity and quality. The variety of cuisine offered lacks diversity and is presented simply with insufficient representation. Residents produce cuisine in relatively small amounts due to limited market access. Specialty dishes are not consistently available and are often only made upon request or during tourist visits. East Sumba's specialty dishes include Manggolu (made from kepok bananas and peanuts) and Kaparak (made from corn, rice, and sago). Other culinary options include Woba (seaweed) from Kaliuda Village, lobster from Lainjanji Village, and instant ginger beverages and moringa biscuits from Prailiu Village. Women's empowerment in culinary management can be improved through increased training in culinary skills, packaging, and marketing strategies.

Women's active participation in the creative economy and cultural preservation sectors is clear through handicrafts and traditional dances that attract tourists. East Sumba's notable handicrafts include ikat-woven textiles and pahikung, which vary from village to village. Women play key roles as artisans and keepers of weaving history and cultural traditions. East Sumba includes several weaving artisan communities, such as Karaja Sumba, Praiyawang, Pau, Prailiu, Kanatang, and Kaliuda. East Sumba features various unique traditional dances with significant historical importance, often performed during traditional ceremonies and to welcome distinguished guests. These dances, as part of tourism attractions, are curated to offer compelling experiences for visitors. Some of the preserved dances in East Sumba include Hogor Watang from Kaliuda village, Tebe and Dho'a dances from Lainjanji village, Ori Angum Dance Studio and Li Luri Dance Studio from Lambanapu village, and Kendingan Dance from Watuhadang village.

Integrated tourism package development can serve as a strategy to enhance family livelihoods by empowering women in East Sumba. Tourism packages are designed around various potentials in an integrated, thematic approach, encompassing cultural assets, natural resources, the creative economy, culinary offerings, and other potentials, all managed through women's empowerment. Integrated tourism packages offer substantial opportunities for women to participate actively in tourism enterprises, from planning to monitoring. Women have opportunities to develop thematic tourism packages related to weaving, integrated with other tourism potentials, thereby enabling woven fabric products to achieve higher economic value. Tourists demonstrate willingness to pay premium prices for tourism packages because they not only acquire woven fabrics as handicraft

products but also gain historical and cultural experiences with considerable educational value. Thematic tourism packages stimulate economic acceleration by engaging resources in both quantity and quality, including women. Women serving as weaving artisans fulfill dual roles: producing woven fabric, packaging, and presenting products to tourists.

Women in East Sumba recognize that their empowerment in the tourism industry generates substantial social impacts, such as increased gender equality, confidence, and skills. Survey assessment scores of 7 and 8 in Table 2 reflect these outcomes. Through empowerment, women gain wider access to operational and leadership roles within tourism management, leading to greater representation and influence in decision-making. Their active involvement also raises awareness and promotes the development of new knowledge, benefiting both individuals and the community. As women take on greater responsibility in tourism, they help foster a more inclusive and equitable industry, enabling broader participation and social progress.

The production structure dimension, which encompasses both services and high-quality products, is a key element supporting the sustainability of the tourism area. Service elements are closely connected to human resource capacity as the leading actors in tourism management (Wirdawati et al., 2024). Success in CBT management heavily depends on local human resource capacity since it operates by, from, and for the community. In Table 2, ratings for indicators related to women's involvement in local infrastructure management and to skills and knowledge in the tourism sector remain relatively low. This is supported by East Sumba Regency data from 2024, showing that community education is primarily at the primary school level, accounting for over 98%. Improving human resource capacity is a critical, urgent step toward sustainable tourism. The quality of tourism products depends on effective management systems supported by sufficient infrastructure (El-Manhaly & Taha, 2024). In East Sumba, local infrastructure in tourism areas is still limited in both availability and accessibility. Restroom facilities, which are essential amenities for tourists, are scarce and often in poor condition. Increased involvement from various stakeholders is needed to accelerate the development of tourism infrastructure and enhance human resource capacity. Stakeholder programs related to infrastructure development include CSR efforts from Sarana Multi Infrastruktur (SMI) in partnership with Universitas Bina Sarana Informatika (UBSI). SMI has helped build restrooms, food courts, UV curing equipment for weaving, and water wells in Watuhadang village. At the same time, UBSI has provided training and support to boost human resource capacity.

According to Table 2, women's empowerment receives high ratings in the processing of environmentally sustainable raw materials and in conservation efforts. Women actively participate in cultural conservation by maintaining weaving traditions and preserving traditional dances (Butler et al., 2022). The use of naturally sourced coloring materials for dyeing threads to be woven into fabrics, such as *Morinda citrifolia* roots, indigo leaves, tree bark, and clay, further demonstrates engagement with sustainable practices.

#### 4.2. Sustainability Ecosystem Level in Tourism Development in East Sumba Tourism

The second system in sustainable tourism comprises the ecosystem, consisting of four dimensions: Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Based on Table 2 data, the average rating value is 6.43, which overall falls within the potentially sustainable category. However, three indicators are considered less sustainable: long-term congestion potential (S118), adequate water availability (SI21), and tourism mitigation implementation (S124).

Tourism management in East Sumba generates both positive and negative consequences. Generally, tourism activities in East Sumba can foster local community awareness of the importance of environmental and cultural preservation as primary products of

the tourism industry. Meanwhile, negative impacts of tourism activities include potential congestion from increased tourist flows, challenges in waste management, and conflicts among local communities (Butler et al., 2022). Waste issues in East Sumba are already becoming apparent, despite tourist visitation flows not yet being substantial. Plastic waste problems are increasingly exacerbating environmental pollution on land and at sea, as adequate waste management systems remain absent. From an institutional perspective, tourism management potentially triggers conflicts within local communities. The primary factors driving internal conflicts include dysfunctional institutions, a lack of transparency, and unclear programming.

The Ecosystem Quality dimension encompasses water resources, land, clean air, and tourism mitigation (Yin et al., 2022). East Sumba is a tourist area with extensive land and clean air, thanks to low pollution levels. In certain areas, water availability remains a fundamental challenge due to hilly terrain and the risk of drought. Natural springs constitute one water source for meeting community needs. Drought is the primary disaster threat to the East Sumba region, while other threats include floods, earthquakes, and tornadoes. Disaster issues in any area significantly influence tourist interest, necessitating robust mitigation as security assurance for tourists. Tourism mitigation in the East Sumba region has not yet been implemented optimally.

The Tourism Diversity dimension constitutes the primary attraction for tourists, including cultural uniqueness, handicrafts, culinary offerings, and natural beauty. The East Sumba region offers diverse and unique cultural tourism attractions, including traditional dances and customary ceremonies, which are still preserved by local communities (Afifa & Nugroho, 2022). One customary ceremony that continues is the death ritual according to Marapu beliefs. This ceremony aims to escort the deceased's soul to the afterlife, where the body can be preserved for years because families must prepare substantial costs for the burial procession. East Sumba offers weaving crafts that access international markets. Woven textiles are created by predominantly female craftspeople and feature various motifs that each possess its own philosophical significance. The culinary offerings remain severely limited, though some areas offer various fish preparations made from fishery products from the archipelagic region. East Sumba is an archipelagic region with significant marine natural resources, including beaches and fisheries. Beach potential attracts tourists with several characteristics, including sea-oriented interests and family travel patterns. The attractions offered by beach potential include striking natural scenery, exotic wildlife, and culture (Hall & Page, 2009), as well as atmospheric freedom, peaceful environments, and local cuisine (Sharpley, 2012).

Sustainable tourism cannot be realized without the Environmental Policy and Management dimension, as an aspect ensuring system functionality. The Environmental Policy and Management dimension includes healthy institutions, development programs, policies, and cooperation with various parties (Kapera, 2018). The Environmental Policy and Management dimension is potentially sustainable with average values of 6 and 7. The institutions managing tourism in East Sumba remain suboptimal, as evidenced by weak administration, ineffective management, and a lack of work programs. Tourism awareness group organizations and CBT managers, as organizations with distinct functions and roles, are often perceived as identical. This incorrect perspective regarding these organizations potentially triggers conflicts in tourism management. Tourism management remains incidental, lacking short-term, medium-term, and long-term planning, which can lead to unsustainable tourism. The government plays an important role in realizing sustainable tourism through policies that serve as references and protection in tourism management. The East Sumba district government, in general, and the Tourism Office, specifically, must issue policies for tourism management and conduct regular training and assistance programs.

The government represents one of the pentahelix elements that collaborate to support tourism management in East Sumba. Other pentahelix elements include academia, business, community, and media. The role of each pentahelix element in East Sumba tourism development includes: government as the policymaker and facilitator; academia supporting human resource capacity building; business supporting infrastructure development acceleration and capital provision; community supporting management systems; and media supporting publication as components of promotion and marketing. The government's role as policymaker is crucial to ensuring legal protection in island-based CBT management, which is vulnerable to degradation, and to optimizing women's empowerment.

#### *4.3. The Harmonization Between the Human System and the Ecosystem of Sustainable Tourism Development in East Sumba*

The Barometer Figure shows the potentially sustainable quadrant, indicating that CBT in East Sumba offers opportunities for sustainable tourism development through efforts to balance the Human System and Ecosystem, facilitated by tourism pentahelix involvement. Collaboration with various parties can accelerate the optimization of sustainable indicators with low ratings. The potentially sustainable condition can decline to the intermediate quadrant or even to unsustainable status if strategic improvement efforts involving various stakeholders are absent. Women as resources become a strategic alternative for realizing sustainable tourism through optimal empowerment. Several aspects that remain unbalanced in sustainable tourism optimization are as follows: (1) Despite gender equality efforts, women in East Sumba have not yet received opportunities to hold management positions, have not received operational roles, and cannot manage businesses independently; (2). Despite efforts to realize ideal institutions, tourism institutions, such as tourism awareness groups and tourism village managers, have not yet implemented administrative procedures, lack transparency, and have no work programs; (3) Despite efforts to build quality ecosystems, mitigation systems are not yet sufficiently robust and water availability is inadequate; (4) Despite waste management efforts, plastic elements are still utilized in food and beverage packaging; (5). Despite efforts to increase tourist attractions, culinary processing using local raw materials remains minimal.

Based on the AMOEBA diagram, small pseudopodia are reaching with a rating value of 4, signifying a less sustainable status, namely indicators for long-term activities impacting density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Limited human resources and capital in tourism management are among the obstacles to securing adequate water supplies and mitigation systems. Therefore, it is crucial for all stakeholders to actively collaborate and take decisive steps to accelerate sustainable tourism management.

Pseudopodia with extensive reach maintain a rating value of 9, indicating that women are developing institutions such as the Family Welfare Movement (SI4), possess unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and exhibit archipelago-based natural beauty potential (SI28). Women in Sumba have ample opportunity to play an active role in women's organizations; namely, as administrators in organizations for family empowerment and welfare. Sumba women play an important role as preservers of Sumba's cultural heritage, as weavers of traditional fabrics. For the most part, women use weaving to generate income and improve their families' economic situation. The AMOEBA diagram is a tool for assessing the sustainability of community indicators by measuring their relative strengths and weaknesses. Based on this diagram, small pseudopodia reached a ranking value of 4, indicating a less sustainable status, namely indicators of long-term activities that affect density and congestion (SI18), adequate water sources (SI2), and tourism mitigation (SI24). Pseudopodia with a wide reach maintain a rating of 9, indicating that women are developing institutions such as the Family Welfare

Movement (SI4), have unique traditional cultural potential (SI25), have distinctive craft potential (SI26), and demonstrate the potential for archipelago-based natural beauty (SI28).

#### 4.4. Sustainable Tourism in East Sumba Archipelago Through Women's Empowerment

Women's empowerment in realizing tourism in East Sumba is achieved through active participation in CBT management, from planning to monitoring. Women's involvement in CBT management in East Sumba remains limited and has not had a significant impact on families' or society's economic development. Optimization of women's empowerment is expected to reduce the still-elevated stunting rates on East Sumba Island. CBT represents a tourism development pattern that emphasizes local community empowerment to improve their economies through tourism business management (Steinicke & Neuburger, 2012). Empowering East Sumba communities, especially women, is fundamental to evaluating the achievements of tourism development. The most crucial empowerment component is empowered human resources, effectively managed to achieve development objectives (Abdullah et al., 2022). Women's empowerment becomes a strategic issue in East Sumba because it supports long-term, significant relationships with poverty alleviation and the reduction in stunting rates. This assertion aligns with Adnyani and Purnamawati's (2024) research, which states that women's roles in indigenous communities in managing Balinese cultural tourism impact family economic resilience. Women in Bali fulfill dual roles by actively participating in various tourism businesses without abandoning family responsibilities.

Women's empowerment in the East Nusa Tenggara region faces various obstacles, including limited capital, unequal employment opportunities, and social gender stereotypes. However, there are significant opportunities for women to increase their participation in the tourism industry, potentially improving their welfare. Implementing inclusive tourism in the East Nusa Tenggara region can generate economic benefits for local communities.

#### 4.5. Pro-Poor Tourism (PPT) Concept in East Sumba Archipelago

East Sumba, as an archipelagic region, possesses tourism potential that could serve as an economic driver. Island potential packaged as tourism packages in CBT management can improve family economic independence. Sustainable tourism plays a role in poverty alleviation by emphasizing several factors, including environmental factors (Neto, 2003), social factors, and political factors (Hall & Page, 2009). PPT can serve as an effective poverty alleviation tool and supports tentative steps to realize its potential. PPT implementation using sustainable development approaches, through stakeholder involvement in corporate social responsibility, significantly impacts poverty alleviation (Diego et al., 2016).

Low PPT implementation in the business sector hinders tourism from fulfilling its role effectively, leading to stagnation and failure. Business sector involvement through CSR programs provides internal and external company benefits that impact economic, socio-cultural, and environmental aspects. Internal benefits include building reputation and business sustainability through improved company image and customer loyalty. External benefits include sustainable development as corporate social responsibility toward broader society (Diego et al., 2016). CSR's role in tourism development on East Sumba Island remains relatively modest. One CSR entity involved in tourism management on East Sumba Island, SMI, is an Indonesian State-Owned Enterprise operating in infrastructure financing. SMI's CSR program supports sustainable tourism development in Watuhadang Village by enhancing the quality of creative economy products in the weaving and culinary sectors, improving restroom facilities, and increasing water availability through borehole construction. PT SMI constructed UV-curing equipment for weaving craftspeople to accelerate drying during the production of woven fabrics. UV Curing availability significantly

helps craftspeople improve product quality and quantity. Food court construction enables the optimization of women's empowerment in the culinary sector, from raw material processing and planning to product marketing. Meanwhile, borehole construction promotes ecosystem quality by ensuring adequate water availability to support tourism activities. Access to clean water is a key issue in the East Sumba region, which is highly vulnerable to drought disasters.

CSR programs that can contribute positively to poverty alleviation possess several characteristics: suitability for impoverished rural areas; labor-intensive approaches; empowerment of women and communities representing economically disadvantaged populations; and encouragement of tourism activities that create business opportunities (Spenceley & Meyer, 2012). CSR describes a multifaceted concept encompassing four categories of community expectations (Carroll, 2017): (1) economic expectations (i.e., companies should be profitable), (2) legal expectations (i.e., companies should operate within legal boundaries), (3) ethical expectations (i.e., business operations should meet specific ethical standards not required by law), and (4) philanthropic or discretionary expectations (i.e., companies should voluntarily contribute to addressing social needs, including poverty alleviation). CSR activities are voluntary, so companies bear consequences for their ethical or philanthropic responsibilities (Inoue & Lee, 2011). CSR maintains a substantial role in poverty alleviation through 'pro-poor CSR' programs. Pro-poor CSR encompasses several key initiatives, including poverty reduction, fostering relationships with local suppliers and informal sectors, promoting sustainable tourism practices, and preserving the natural environment of economically disadvantaged communities. Companies can collaborate with secondary stakeholders such as NGOs, government institutions, and international organizations (Smith & Ong, 2015).

## 5. Conclusions

Women represent a significant potential resource in East Sumba, given their considerable numbers and their status as unpaid family workers. Women's empowerment in East Sumba becomes a strategic issue due to cultural traditions and persistently strong patriarchal perspectives (Swari, 2023). Women play crucial roles in achieving family economic independence and reducing stunting rates through their involvement in tourism businesses. Tourism empowerment is measured through sustainable tourism approaches that encompass two inseparable systems: the human system and the ecosystem. The human system encompasses four key dimensions: political, economic, social, and production structure.

In contrast, the ecosystem comprises Environmental Impacts, Ecosystem Quality, Biodiversity, and Environmental Policy and Management. Each dimension contains four indicators, resulting in 32 indicators for measuring tourism sustainability levels in East Sumba. Based on scoring results for 32 indicators, tourism in East Sumba falls within the potentially sustainable category, with opportunities for sustainability through adjustments and strengthening several indicators. This research provides strategic recommendations to advance sustainable tourism, focusing on inclusive tourism through women's empowerment, the creation of thematic, integrated archipelago-based tourism packages, the establishment of healthy CBT institutions, and the strengthening of Pentahelix cooperation.

The theoretical implication of this research is to enrich references on women's empowerment in island tourism areas. The references offer concepts of inclusive and pro-poor tourism management. Island tourism areas have unique and vulnerable characteristics, so this study is expected to provide strategic references. In practical terms, this study provides an overview of the sustainability of tourism developed in the Sumba Island tourism area through women's empowerment. The existing conditions serve as a reference for

relevant stakeholders to formulate plans for Sumba women's participation in supporting sustainable tourism management.

This study offers several recommendations for women's empowerment in CBT across the archipelago. The implication of this research is to provide a broader understanding for various stakeholders, especially women, thereby increasing their involvement in the tourism industry. The active participation of women in the tourism business specifically increases family economic independence and, more generally, influences the financial movement of local communities in East Sumba Regency. Family economic independence in the short- and medium-term can significantly reduce stunting rates.

This research has limitations in geographic coverage, making it difficult for researchers to reach all tourist villages in East Sumba Regency. East Sumba Regency has 14 tourist villages that are relatively far apart, and internet access is limited, which poses an obstacle to data collection. Researchers need time and effort to obtain representative data. The research involved only two systems—namely, the Human System and the Ecosystem, each comprising eight dimensions and 32 indicators. Future research is expected to reach 14 tourist villages in East Sumba Regency. The research dimension can be enriched by including other under-researched areas, such as sociopreneurship and investment in CBT development.

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## Abbreviations

The following abbreviations are used in this manuscript:

CBT	Community-Based Tourism
PPT	Pro-Poor Tourism
CSR	Corporate Social Responsibility
BTS	Barometer of Tourism Sustainability
ATSI	AMOEBAs of Tourism Sustainability Indicators
SI	Sustainability Indicator
SMI	Sarana Multi Infrastruktur
UBSI	Universitas Bina Sarana Informatika

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