



ECO-TOURISM IN ERA 4.0 FOR SUSTAINABLE TOURISM (CASE STUDY IN BUFFER VILLAGE OF WAY KAMBAS NATIONAL PARK, LAMPUNG, INDONESIA)

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ABSTRACT

This research aims to analyze the development of eco-tourism in BrajaHarjosari village as a buffer village for the Way Kambas National Park (TNWK) Lampung in the industrial era 4.0. The research uses a qualitative approach with data collection techniques through observation, interviews, literature review, and documentation. The results show that Based on the discussion above, it can be concluded that the development of eco-tourism villages in the TNWK buffer area, especially Braja Harjosari village in the era of the industrial revolution 4.0, has utilized technology to build an eco-tourism market through digital marketing tourism, where efforts to promote and market an area or attraction tourism using digital media which includes the use of websites, social media, online advertising, marketing by electronic mail, online discussions and smartphone applications. However, the development of this eco-tourism village must pay attention to the rules and regulations that the government has set so as not to cause environmental problems, and sustainable tourism can be realized.

Keywords: Eco-tourism, eco-tourism village development, revolution 4.0. sustainable tourism

DOI Number:10.14704/nq.2022.20.8.NQ44836

NeuroQuantology 2022; 20(8): 8127-8141

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A. INTRODUCTION

The United Nations World Tourism Organization (UNWTO) recognizes that the tourism sector is a leading sector and is one of the important keys to regional development and increasing welfare for the community. UNWTO data (2013) shows that

the contribution of the tourism sector to world GDP is 9%, 1 out of 11 jobs are created by the tourism sector, and the contribution to the value of world exports is USD 1.4 trillion or equivalent to 5% of exports that occur in the world (Singh et al., 2021).



Based on the National Long-Term Development Plan (RPJPN) 2005-2025, all development sectors in Indonesia must apply the principles of sustainable development. In the context of tourism, the paradigm of tourism development has evolved from mass tourism to sustainable tourism. Based on the Quebec Declaration specifically states that eco-tourism is essentially a form of tourism that adopts the principles of sustainable tourism (Abrianto et al., n.d). Based on the analysis of TIES, the growth of the eco-tourism market ranges from 10-30% per year, while the overall growth of tourists is only 4%. In 1998, the WTO estimated the growth of eco-tourism at around 20%. The growth rate in the Asia Pacific region ranged from 10-25% in the mid-1990s (Wondirad, 2020).

The emergence of tourism as one of the fastest-growing industries has significantly contributed to the economic growth of countries in the world. Tourism has created new jobs, increased incomes, and a trade balance. However, the development of the tourism industry often ignores social and environmental aspects and only pursues economic benefits (Manzoor et al., 2019). Therefore, in this 4.0 revolution era, sustainable tourism has become a very popular topic among experts and practitioners based on increasing public awareness about the importance of protecting nature and the environment for economic sustainability and development (Verma et al., 2022).

Based on a report issued by the World Tourism Organization (WTO), nature tourism has become an alternative tourism activity and has developed in the tourism world since the 1990s. With the tendency of global, regional, and national communities to return to nature, people's interest in traveling to unspoiled places is getting bigger (Saarinen, 2021). This interest is a driving

factor for developing tourism-oriented to the natural environment or what we know as eco-tourism or ecological tourism, or it can also be called eco-tourism. This fact is the antithesis of tourism activities that have developed so far, which are more supportive of the pattern of mass tourism (Beall et al., 2021).

Eco-tourism contains perspectives and dimensions that face the future of sustainable and environmentally friendly tourism. This arises because of the tendency and development of lifestyles and new community awareness for a deeper appreciation of the values of relationships between humans and their natural environment. In principle, eco-tourism is a tourism trip responsible for environmental sustainability and the welfare of the local community (Zheng et al., 2021).

Over the past three decades, issues relating to the environment and sustainable development have shifted from being marginal to being the focus of discussion and study. The expansion of social media and traditional media as a result of the industrial revolution 4.0 is one of the elements contributing to this transformation (Sharifi et al., 2021). This element enhances environmental consciousness, which is impacted by accounts of various ecological disasters, increased activity of interest groups focused on environmental problems, and increasingly strict national and international environmental laws and regulations (Luo et al., 2021).

The development of ecotourism correlates with the fourth industrial revolution, which is a major transformation in human life and work processes, where advancements in information technology can be integrated into the digital world of life, which can have an impact on scientific disciplines. The rise of industrial revolution 4.0 has far-reaching effects, even on nearly



the entire human social order, and the ecotourism business is no exception (Abad-Segura et al., 2020). Therefore, eco-tourism activities require good governance to develop eco-tourism progress with the various challenges that exist while being able to take advantage of technological advances for the realization of sustainable tourism development that does not only pay attention to the economic aspect but also the socio-cultural aspects of the local community as well as the environment/ecology (Wondirad et al., 2020). An active role in managing ecotourism potential is important because knowledge of nature and cultural potential has a selling point as an ecotourism attraction. The development of ecotourism ultimately has a close relationship with the community in ecological, social, and economic aspects (Thompson, 2022).

Based on the results of observations, documentation, and literature reviews, ecotourism opportunities in the buffer villages of the National Park are very wide open, but this has not been implemented properly in one of the buffer villages located on the border of the Way Kambas National Park area is BrajaHarjosari Village. BrajaHarjosari Village is a fostered village under the Tropical Forest Conservation Action-Sumatra (TFCA-Sumatra) program of the AlERT- University of Lampung Consortium. This village has various tourism potentials such as oyster mushroom cultivation, crystal guava plantations (*Psidium guajava*), pier tourist attraction, BrajaSlebah traditional market, fire stove center, traditional rice planting, and Balinese dances. This paper will describe how the development of eco-tourism in BrajaHarjosari village as a buffer village for the Way Kambas National Park (TNWK) Lampung in the industrial era 4.0?

B. LITERATURE REVIEW

1. Eco-tourism

The concept of ecotourism has periodically evolved. Ecotourism is a sort of tourism that is responsible for preserving untouched places (natural resources), generating economic advantages, and safeguarding the cultural integrity of the local community. Ecotourism, based on this concept, is a sort of conservation movement carried out by the global population. These ecotourists are by nature conservationists (Fibrianto, 2021).

The Ecotourism Society was the first to introduce the definition of ecotourism: Ecotourism is a sort of tourism that involves visiting natural regions with the goal of conserving the environment and preserving the local culture. Initially, ecotourism was practiced by nature-loving tourists who, in addition to preserving the culture and welfare of the people, desired the tourist destination to stay intact and sustainable (Mondino & Beery, 2019).

It turns out, however, that this sort of ecotourism is expanding due to strong demand from tourists. The desire of tourists to visit natural regions might stimulate economic activity. Then, ecotourism is defined as follows: Ecotourism is a new form of environmentally responsible travel that can stimulate the tourism sector (Yanes et al., 2019). Based on these two criteria, it is clear that ecotourism has developed significantly throughout the world. Several places within the national park have been successful in establishing this ecotourism (Lasso & Dahles, 2021).

In fact, in some areas, a new idea has developed related to the notion of ecotourism. In this type of tourism, the phenomena of education is required. According to the Australian Department of Tourism, ecotourism is described as nature-based tourism that incorporates teaching and interpretation of the natural



environment and community culture, as well as ecological sustainability management (Mondino & Beery, 2019). This definition highlights that the connected characteristics are closer to special interest tourism, alternative tourism, or special interest tourism with natural tourist items and attractions than to business tourism and other forms of tourism (Soleimani et al., 2019).

2. Sustainable Tourism

The World Commission for Environment and Development (WCED), the world commission for environment and development established by the United Nations General Assembly, was the first to present the notion of sustainable development. Sustainable tourism can be understood as a tourism development process that prioritizes the conservation of the resources necessary for future growth (Liburd et al., 2020). The Sustainable Tourism Charter of Haryanto, Indonesia, from 1995 emphasizes that tourism must be based on sustainable criteria, the essence of which is that long-term ecological development must be supported and tourism must be economically viable and ethically and socially fair to local communities (Zhang et al., 2022). Thus, sustainable development is a comprehensive and systematic endeavor to improve the quality of life through the sustainable regulation of the supply, development, use, and upkeep of resources (De Jong et al., 2018).

Mahdayani to realize sustainable tourism requires a sense of responsibility and does not cause damage to nature and culture, and respects the customs of tourist destinations. Sustainable tourism is also seen as an alternative to increasing regional income by optimizing the potential of tourism areas and increasing the provision of services around tourist areas (Eichelberger et

al., 2021). In addition to maintaining the authenticity of an area (both natural and traditional), sustainable tourism can also be an alternative to increase the income of an area (KC et al., 2021).

Chamdani defines sustainable tourism development as an integrated and structured endeavor to improve the quality of life via the sustainable development, usage, and preservation of natural and cultural resources (Di Vaio & Varriale, 2020). Obviously, this is possible with a system of good governance that includes the active and balanced engagement of the government, the business sector, and the community. On this basis, sustainable development is tied not only to environmental challenges, but also to democracy, human rights, and other broader issues (Siakwah et al., 2020).

Sustainable tourism is a concept in developing tourism in an area that provides many benefits and advantages from various sides, including economic, environmental, and social (Roxas et al., 2020). Sustainable tourism development involves ensuring that future generations can enjoy the environmental, social, and cultural resources utilised in tourism development today (Chatkaewnapanon & Kelly, 2019).

According to Sunaryo, tourism development is a process of basic changes carried out by humans in a planned manner in certain tourism conditions that are considered unfavorable, which are directed towards a certain tourism condition that is considered better or desirable (Parani et al., 2021).

Based on the explanation of the notion of sustainable tourism, the authors state that sustainable tourism is a concept in tourism development in the long term that still pays attention to the authenticity of an area, be it nature, customs, or traditions of the community and their customs, which



later with the existence of the concept of sustainable tourism will increase the income of the community and the region.

C. METHOD

This type of research is descriptive exploratory with a qualitative approach which is intended to obtain data about existing facts and symptoms, as well as factual information that can be used to develop eco-tourism in BrajaHarjosari village as a buffer village for the Way Kambas National Park (TNWK) Lampung in the industrial era 4.0. Data collection uses participatory observation techniques, open interviews, literature searches, and documentation. Observations and interviews in the field to obtain data related to eco-tourism development in the 4.0 revolution era. Meanwhile, other data from the latest scientific literature in the 2015-2021 range has been documented in books, theses, journals, archives, and other books related to this research.

D. RESULT AND DISCUSSION

1. Description of Way Kambas National Park

The forest area of Way Kambas National Park (TNWK) was declared by the Minister of Agriculture in 1982 and appointed by the Minister of Forestry, SK No.: 14/Menhut-II/1989, with an area of 130,000 hectares. TNWK was later determined by the Minister of Forestry, SK No.: 670/Kpts-II/1999, with an area of 125,621.3 hectares, located in Central Lampung Regency and East Lampung Regency, Lampung Province. TNWK is a representative of lowland forest ecosystems consisting of freshwater swamp forests, grasslands of reeds/shrubs, and coastal forests in Sumatra.

The plant species in this national park include fire (*Avicennia marina*), pidada

(*Sonneratia* sp.), Nipah (*Nypafruticans*), gelam (*Melaleuca leucadendron*), salam (*Syzygium polyanthum*), Rawang (*Glochidion borneensis*), ketapang (*Terminalia cattapa*), sea fir (*Casuarina equisetifolia*), pandanus (*Pandanus* sp.), puspa (*Schimawallichii*), meranti (*Shorea* sp.), oil (*Dipterocarpus gracilis*), and ramin (*Gonystylus bancanus*). TNWK has 50 species of mammals, including the Sumatran rhino (*Dicerorhinus sumatrensis*), Sumatran elephant (*Elephas maximus sumatranus*), Sumatran tiger (*Panthera tigris sumatrae*), tapir (*Tapirus indicus*), forest dog (*Cuon alpinus sumatrensis*), siamang (*Hylobates syndactyl*); 406 bird species, including forest duck (*Cairina scutulata*), clothing lawe stork (*Ciconia episcopus stormi*), tong-tong stork (*Leptoptilos javanicus*), blue stork (*Lophura ignita*), kuau (*Argusianus argus*), snakehead (*Anhinga melanogaster*); various types of reptiles, amphibians, fish, and insects.

The wild elephants are trained at the Way Kambas Elephant Training Center (9 km from the Plangljo gate) as elephant rides, attractions, timber transportation, and field plows. At the elephant training center, trainers educate and train wild elephants, watch elephants play ball, dance, shake hands, salute, drape flowers, tug of war, swim, and many other attractions. However, this attraction was later stopped by the manager of the TNWK Center. This elephant training center was founded in 1985, and so far, it has succeeded in educating and taming around 290 elephants. Some of the tame elephants were sent to various regions in Indonesia or exchanged with cooperation agreements with several parties abroad.

The Way Kambas National Park Center is developing an eco-tourism village as a secondary tourist destination in East Lampung Regency. The development of eco-



tourism villages as secondary tourist destinations for visitors aims to increase tourists to this TNWK. Another goal of developing an eco-tourism village is so that people around the TNWK forest area can also feel the economic benefits of tourist visits to TNWK. Within the eco-tourism village, it will offer a shelter or homestay for visitors who want to spend the night, various handicrafts from local villages, and various culinary delights from this region.

BrajaHarjosari Village, as a tourist village, already has eco-tourism objects that have become tourist attractions. The existing tourist attractions in BrajaHarjosari Village have 7 locations spread across various

hamlets, where tourists can learn how to cultivate oyster mushrooms which are traditionally managed and process harvested oyster mushrooms. Then pick, consume and pack the crystal guava ready to be harvested directly from the garden. Tourists can also buy tools and traditional snacks and see the buying and selling process at the BrajaSlebah traditional market. Buy and learn how to make traditional fireboxes at the hearth center. Planting and plowing rice traditionally. Enjoy and learn Balinese dances. The last object is for tourists to see the panorama of the Way Kambas National Park area on the pier.

Table 1. Description of the distribution of BrajaHarjosari Village Tourism Objects

No	Sightseeing Name	Potency	Time and Location
1	Oyster Mushroom Cultivation	This oyster mushroom is cultivated traditionally. Tourists will practice making mushroom-growing mediaoysters. In addition, tourists also process crispy oyster mushrooms and can immediately taste the processed products themselves.	Morning hamlet IV
2	Crystal Guava Plantation Tourism Object	This crystal guava plantation has an area of 3 hectares. The tour offered to visitors is that visitors can pick the crystal guava fruit directly from the tree. Only fruits that look large and ripe can be picked. Besides picking fruit, tourists are also taught how to pack crystal guavaproperly and correctly.	Afternoon Village VIII
3	Pier Sightseeing	The location of this tourist attraction is located near the river, which is the border between BrajaHarjosari Village and the Way Kambas National Park area. Tourists can also see the panorama of the area with the beauty of the birds and the natural atmosphere around it.	Evening Village VIII
4	BrajaSlebah Traditional Market Tourism Object	This BrajaSlebah traditional market is a market in the BrajaSlebah sub-district. BrajaSlebah District has 7 villages, one of which is BrajaHarjosari Village. Tourists will be presented with this traditional market's buying and selling process. This traditional market sells various traditional tools, traditional snacks, etc.	Morning Hamlet II



5	ObjectFurnace Center Tour	Tourists can see how to make a fire stove at this attraction. In addition to seeing, tourists will also practice directly in making this firebox as in the oyster herbal tourism object. Furnaces can be brought home by paying 20 thousand per stove.	Afternoon Village VII
6	Traditional RicePlantingAttractions	Tourists will be invited to plow the fields traditionally. Tourists will also be invited to take a napin the fields, guided by local farmers so that the nandur process is good and correct. The sensation felt will be different because everything is made with the concept of "back to nature".	Afternoon Hamlet I
7	ObjectBalinese Dance Tour	Tourists can enjoy authentic Balinese dances such as Kecak dance,ngibing dance, etc. In addition, tourists can learn to play gamelan and learn to dance.	Evening Village VII

(Maulana et al., 2017)

2. Development of Ecotourism in the Village of BradjaHarjosari

Based on the results of a study from the Unila research team. The development of eco-tourism by utilizing social media resulted in the development of a tourist attraction in the village of BradjaHarjosari. Based on the Recreation Opportunity Spectrum (ROS) method, various spectrums of recreational opportunities are obtained with their respective characteristics. According to Sujadi, development is a process or step to develop a new product to improve an existing product that can be accounted for.

Various eco-tourism tourism objects in BrajaHarjosari Village can be developed to

increase their attractiveness for the better. Tourist objects are one of the important components in the tourism industry and one of the reasons for visitors to travel (something to see). Abroad tourism objects are called tourist attractions, while they are better known as tourist objects in Indonesia. A tourist object is a place or natural condition with tourism resources built and developed so that it has an attraction and is cultivated as a place visited by tourists. An additional 9 tourism objects can be developed, namely wild elephant tourism (elephant watching), river tourism, water tourism, horse riding, tame elephant riding, culinary center, and souvenir center.

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Table 2. Description of Development of BrajaHarjosari Village Tourism Object

No	Sightseeing Name	Potency	Time and Location
1	Tourist Attractions to See Wild Elephants (Elephant Watching)	This tourist attraction is close to the location of the pier. This location borders the Way Kambas National Park area, where wild elephants are often seen. Tourists can see wild elephants directly from evening to early morning. The location of the elephant conflict with the community. The elephants try to enter the village to find food through this route.	Evening Village VIII



2	River Sightseeing	Utilizing the potential of the river on the border between the TNWK area and BrajaHarjosari Village, many activities can be done to increase tourist attraction. Tourist activities can be done, such as trekking theriver by boat, bathing in the river, and fishing for fish.	Afternoon Village VIII
3	Water Attractions	Utilization of the prairie area and open view of BrajaHarjosari Village near the pier. An artificial river is designed on the land used for various kinds of water tourism, such as playing with water ducks, playing with canoes, and playing with water tires.	Evening Village VIII
4	Horse Riding Sightseeing	Utilization of the prairie area and open view of BrajaHarjosari Village is also near the pier. It willbe used for horse riding and taking pictures with horses. We can also enjoy the natural beauty because it is directly adjacent to the TNWK area. Horses that are prepared are trained horses.	Morning and Evening Village VIII
5	Tourist Attractions Riding Tame Elephants	Utilization of the prairie area and open view of BrajaHarjosari Village near the pier. It will be used for the area to ride tame elephants and take pictures with tame elephants. We can also enjoy the natural beauty because it is directly adjacent to the TNWK area, we need a permit to bring tame elephants outfrom the area.	Morning and Evening Village VIII
6	Central Tourist Attractions Culinary	Local people process food products that can be brought as souvenirs by tourists, such as chips, kelanting,tiwul, and mokaf	Afternoon hamlet I
7	Central Tourist Attractions Souvenir	Local people process handicrafts into souvenirs for tourists, such as key chains, statues, bags, t-shirts,dolls, stickers,etc	Afternoon hamlet I
8	Dance Attractions Leathered horse	People who are dominated by Javanese tribes should also be able to perform their tribal dances, such as danceslumping horses,etc	Afternoon Village VIII
9	Garden Sightseeing Jackfruit (JackfruitCempeda)	This Nangkada plantation has an area of 2 hectares. This jackfruit garden belongs to an individual named Mr.Twin. The tours offered to visitors are visitors can pick jackfruit directly from the tree.	Afternoon Hamlet II

Source: (Maulana et al., 2017)

3. Eco-tourism for Sustainable Tourism

A tourism destination, in the sense of a tourism system, is a geographical area within 1 (one) or more administrative areas that has tourist attractions, public facilities, tourism facilities, accessibility, and communities that are interconnected and

contribute to the development of tourism. According to Yoety, an area to be a good tourist destination (DTW) must develop three things so that the area is interesting to visit. Namely, there is something that can be seen, something that can be bought, and something that can be done. And this has



been done in the eco-tourism village at the research site (Bruwer&Rueger-Muck, 2019).

Issues and problems in conservation areas, especially in national parks, often occur around buffer areas, bordering villages, or local population settlements. For this reason, a new conservation concept was developed (innovative, creative, and selective conservation) who are very good at repositioning conservation science and technology that can be used to develop prospective businesses that can synergize ecological, economic, and socio-cultural interests (Boillat et al., 2018). With the created business, funds will be obtained to rehabilitate and control and deal with environmental damage so that it does not get worse. One form of using the new conservation concept in conservation forest areas currently developing is eco-tourism activities.

Ecotourism is the concept of developing and implementing tourism activities based on the use of the environment for the protection and with the active core participation of the community and by presenting products containing education and learning, having a minimal negative impact on the environment, contributing positively to regional development, and being applied to protected areas, open areas, fostered areas, and cultural areas (Kunjurman et al., 2022).

Forests, including national parks, are considered areas that have a high potential for eco-tourism or eco-tourism. With the diversity of flora and fauna contained in Indonesia's tropical rainforests, it should benefit the world of Indonesian tourism. The problem of eco-tourism in Indonesia does not lie in its potential but rather because of the problem of developing its potential. In the development of eco-tourism, at least four aspects need to be considered.

First are clear regulations regarding using national parks or conservation areas as tourism arenas. So far, there is Government Regulation No. 36 of 2010 concerning Natural Tourism Exploitation in Wildlife Sanctuaries, National Parks, Grand Forest Parks, and Nature Tourism Parks. The regulation contains regulations, obligations, rights, and provisions for natural tourism developers in conservation areas. Second is public awareness of the use of natural resources. Communities in several national parks in Indonesia have started to take advantage of the wealth of national parks as an addition to their income, such as the Bukit Barisan Selatan National Park (TNBBS) and Way Kambas National Park (TNWK). People take advantage of elephant migration time as a tourist service area. The third is the support of related institutions. The institutions in question range from the central government through the ministry that issues regulations to the level of the Governor, the Regent/Mayor who grants permits to evaluate the usefulness of national parks. Others are private institutions as investors to conservation assistants. Fourth is the motivation of the community both locally and nationally. These four factors make eco-tourism optimal.

So what is the problem with maintaining sustainability? From the literature search of research results, several problems related to eco-tourism in the community are: First, the planning of eco-tourism development in the village does not consider the sustainability aspect. Second, the costs incurred in developing eco-tourism destinations are often only focused on spatial planning without thinking about innovation, creativity, and uniqueness. For example, how to offer something truly authentic and stunning, friendly facilities for visitors, and eco-friendly tourism are always absent in the eco-tourism landscape in the



village (Kunjuraman, 2020). In other villages in Indonesia, also almost the same thing. Often because they are talkative about the actions of other villages, an eco-tourism destination is built just relying on natural exotica.

In addition to policy and planning support, many local eco-tourism does not yet reflect the ethos of local culture, including the problem of cleanliness and waste management. People in rural areas do not all have a good waste management model. Not a few people in the village dispose of their waste by burning, piling, and throwing it into the river or ocean (Walter et al., 2018). This bad behavior also characterizes the existence of eco-tourism destinations in villages, where waste and the use of single-use plastics, for example, have not become a priority to be managed. This makes tourist destinations in rural areas pressed for environmental problems. Eco-tourism destinations offer education to their visitors. Enjoying nature tourism means entering the deepest contemplation space, how nature provides goodness to humans.

Therefore, nature tourism means the importance of harmonization between nature and humans. An appreciation of the universe that must be guarded and preserved with love. Thus, building an eco-tourism destination in the village means maintaining the order of local values . Plan for sustainability, participation,role model from residents, and growing hope for progress from the village.

What about the development of eco-tourism in this 4.0 era? The industrial period 4.0 is a high dependence on information and communication technology (ICT) which is a means that helps in life in various fields, including the world of tourism. Like it or not, there has been a change in market behavior followed by a change in consumer behavior. Consumers are now more mobile, personal,

and interactive; this is the nature of digital, namely, the more digital, the more personal. The world's industry has shifted towards the digital industry era 4.0.

The tourism industry has also experienced changes in tourist behavior, with empirical evidence showing that 70% of search and share has gone digital. The travel agent industry can no longer rely on walk-in services for ticket reservations and tour packages because the information and reservation system has changed digitally (Javed et al., 2020). There is a term from the Ministry of Parkraf, namely the more digital, the more professional and the more digital, the more global so that industries that involve the generational community in the digital world have the potential to win the future market.

The development of eco-tourism in industry 4.0 implicitly markets eco-tourism through digital marketing by promoting and marketing an area or tourist attraction using digital media such as websites, social media, online advertising, direct email marketing, discussion forums, and mobile applications. Therefore, the Ministry of Tourism has created three jargons as an effort to promote the tourism market today with Go Digital the Indonesian Ministry of Tourism, namely: a) The More digital, the more personal is, themore digital we promote tourism personally, we can find out demographics, psychographics, and consumer behavior effectively and measurably; b)The More digital, the more professional is that the more digital we are, the more professional we are in promoting tourism;c) The More digital, the more global is, the more digital we can reach consumers various country.

Several previous studies have shown that the role of digital marketing is very influential in bringing in tourists by implementing E-tourism (IT-enabled tourism



or electronic tourism), which utilizes the sophistication of information and communication technology to increase efficiency in the tourism sector, providing various tourism services to customers in the form of telematics and make the implementation of tourism marketing more accessible (Navio-Marco et al., 2018).

E-tourism is a modern method of promoting and disseminating the most up-to-date information about tourism, such as tourist attractions, hotels, travel agents, and events, that can be accessible 24 hours a day, 7 days a week, and by anybody. E-tourism is an online, interactive system that makes it easier for tourists to obtain information and make reservations for hotels and travel agents, among other facets of tourism. E-tourism has a premise that corresponds with its application, namely the promotion of tourism development. E-tourism requires three elements: ICT

(Information and Communication Technologies), Tourism and Business, and government backing (Pencarelli, 2020).

How is the development of an eco-tourism village in BrajaHarjosari village which is a buffer zone for TNWK in the industrial revolution 4.0 era? from the results of observations and interviews as well as documentation searches, the eco-tourism village manager there has used technology to build an eco-tourism market through digital tourism marketing. PokdarwisDesaBrajaHarjosari promotes and markets tour packages or eco-tourism attractions using digital media, including websites and social media (Instagram, Facebook, Whatapps, and others), online advertising, marketing via electronic mail, online discussions, and smartphone applications. Here is the BrajaHarjosari Way village tour package, which is displayed on their website:



Figure 1. BrajaHarjosari Ecotourism Village tour package

Sources: Sumber: <https://waykambas.org/desa-braja-harjosari/>

Efforts to develop eco-tourism through information technology have been carried out, although not yet maximally, but continue to be improved by the Pokdarwis in the village and eco-tourism actors associated with these activities. The development of this eco-tourism village must also pay attention to the principles and criteria of eco-tourism management in the Indonesian National Standard, namely the preservation of ecosystem functions, preservation of natural tourist attractions, socio-cultural sustainability, satisfaction, safety and comfort of visitors, and has the principle of benefits economy (Purnamawati et al., 2022). Industrial revolution 4.0 does emphasize direct synchronization and the integration of several fields that make connectivity coverage wider and more systematic. Indirectly, during the last decade of technological and industrial progress, globalization and climate change affected human life in almost all fields, including ecology. These three factors are the determining factors of global geopolitics today.

Alec Ross believes that this 4th industry will give birth to many innovations, which will create good things. But Ross also said the industry could trigger the emergence of things that seriously jeopardize the well-being of people, creating a challenge for humanity to make this revolution an opportunity or a threat. One of the negative impacts that will be caused by industry 4.0 in the ecological realm is environmental damage (Hermes et al., 2020).

One theory of development or modernization says that development will sacrifice a lot to the environment. Increasing industrial demands and increasingly advanced technology have caused environmental damage due to excessive exploitation of natural resources. Since the

industrial revolution was initiated in the 17th century, it has brought many changes that place industry and humans as the main destroyers of nature. Technology and equipment that are increasingly developing require more and more energy. Nature, as the main energy source, must inevitably become a victim to meet the energy demands needed. To fulfill these needs, many natural resources have been overexploited.

In the context of eco-tourism development that does not pay attention to the rules and regulations set by the government, it will inevitably cause environmental damage because the industry that makes nature the object of its development will automatically destroy that nature (Meng et al., 2022). These problems ultimately lead to environmental problems. From global warming, ecosystem imbalance, and climate change to the depletion of natural resources, especially non-renewable ones. The environmental problem is like a domino effect causing other problems. Floods, landslides, clean water crises, air pollution, and starvation are examples of the domino effect of environmental damage due to the industrial revolution. These effects have the potential to threaten human safety and welfare.

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E. CONCLUSION

Based on the discussion above, it can be concluded that the development of eco-tourism villages in the TNWK buffer area, especially BrajaHarjosari village in the era of the industrial revolution 4.0, has utilized technology to build an eco-tourism market through digital marketing tourism, where efforts to promote and market an area or tourist attraction using media digital, which includes the use of websites, social media, online advertising, marketing via electronic



mail, online discussions, and smartphone applications. However, the development of this eco-tourism village must pay attention to the rules and regulations that the government has set so as not to cause environmental problems, and sustainable tourism can be realized.

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