



# Innovation in tourism development in Rote Ndao District, East Nusa Tenggara Indonesia

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## Abstract

This research aims to describe tourism in Rote Ndao Regency and build an innovation model for its development. This study uses a qualitative method. Rote Ndao Regency has potential tourism spread across eleven districts. The research findings show that tourism development in Rote Ndao Regency at least uses the conventional/existing approach, innovation/digitalization of tourism information, and a hybrid approach – a combination of existing and innovative systems. The research recommendation is the importance of increasing the budget and optimizing the collaboration of various parties, such as the government and the community, in tourism development, coupled with increasing minded tourism and capacity among the civil apparatus of the state and community resources. This research is important for the future in optimizing development structures based on object zoning, approaches and knowledge-creation processes in tourism development.

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## Introduction

Innovation drives competitiveness, making innovation studies crucial (Carson & Carson, 2018). Through innovation, all potential regional resources can be optimized for the best service to the community and internal stakeholders. Governments and businesses must innovate in unpredictable and stagflationary times (Arcese et al., 2021; Carson & Carson, 2018; Sun et al., 2021). The Indonesian government continues

promoting innovation to increase national competitiveness (Arcese et al., 2021). There are various obstacles in Indonesia in developing an innovation system (SINAS), namely: (1) there is no vital institution in terms of legal authority in implementing SINAS; (2) there is no national consensus on SINAS; (3) there is no system of knowledge flow and human capital mobility between industry and research institutions; and (4) there is no venture capital financing scheme and investment climate that strengthens SINAS (<https://www.bppt.go.id>).

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The public sector innovation discourse, which refers to the New Public Management/NPM concept, is considered to adopt an innovation model in the business sector. The public sector innovation discourse, which refers to the New Public Management (NPM) concept, is considered to adopt an innovation model in the business sector. However, Pikkemaat et al. (2019) argue that innovation in the public sector has its uniqueness, which can be sourced from local knowledge and public activities.

Public sector innovation that refers to the New Public Management concept with its uniqueness can be seen in The Rote Ndao Regency Government, which combines modern concepts with local wisdom and tourism. The Rote Ndao Regency Government has set a vision for realizing a “dignified” Rote Ndao community sustainably based on tourism supported by agriculture and fisheries (Booyens & Rogerson, 2019; Pikkemaat et al., 2019). Tourism development is the main program supported by agriculture and fishing. Referring to this vision, the Culture and Tourism Office of Rote Ndao aims to increase economic growth and people’s welfare through the tourism sector supported by the agriculture and fisheries sectors (Arcese et al., 2021). Rote Ndao has a variety of natural beauty that has not experienced pollution, culture, religion, friendliness, and honest people, so it is interesting to visit (Sun et al., 2021). Foreign and domestic tourists can visit tourist destinations spread over eleven sub-districts in the Rote Ndao district: marine tourism, nature, history, special interests, cultural tourism, water tourism, and gold jewellery. However, the COVID-19 pandemic significantly impacted tourist

visits and budget relocation in Rote Ndao Regency, as shown in Table 1 and Table 2. It tended to decrease from the allocation of APBD funds for the 2019–2021 fiscal year. Thus, this research aims to describe tourism in Rote Ndao Regency and to construct an innovative model for tourism development in Rote Ndao Regency.

The reason for conducting this research is that it needs to be explored and proven in more depth regarding the implementation of new public management conceptually with the reality in government based on income from tourism in Indonesia. Thus, the main objective of this research is to explore the concept of new public management in Rote Ndao as an area whose main income is from the tourism business, where the tourism concept combines local wisdom with modern concepts. Another aim is to explore and narrate tourism management innovations based on new public management in Rote Ndao, Indonesia.

The contribution of this research is aimed at tourism actors to develop innovative models of hybrid-based tourism management, namely, integrating traditional local wisdom with modern systems, namely, digital-based. The contribution to the theory is aimed at innovation theory, which leads to digital-based environmental innovations that are implemented in digital tourism villages. Meanwhile, contributions to policy are aimed at regional governments and the central government to establish cooperation in the fields of energy, communications and information, including the internet, in rural areas so that domestic and foreign tourists can experience tourism development in the village.

**Table 1** Tourist attractions by type

No.	Type of Tourist Place	Name of Location	Information
1	Beach Tourism	<ol style="list-style-type: none"> <li>1. Oeseli Beach</li> <li>2. Nirvana Beach</li> <li>3. Nembrala Beach</li> <li>4. Bo’a Beach</li> <li>5. Oesoselo Beach</li> <li>6. Tolanamon Beach</li> <li>7. Mouth Seribu Beach</li> <li>8. Laviti Beach</li> <li>9. Dead Sea Lake</li> <li>10. Mando’o Hill</li> <li>11. Oemau Spring Baths</li> <li>12. Oesamboka Baths - Lelain</li> <li>13. Termanu Stone</li> </ol>	The concept of digital-based management is carried out in collaboration with Telkom Indonesia in developing digital-based ticket purchasing models, digital parking, digital tourist location instructions, website-based information and digital tourist location maps.
2	Digital Villages	<ol style="list-style-type: none"> <li>1. Kolobolon Village</li> <li>2. Baadale Village</li> </ol>	The development of tourist villages is carried out in collaboration with the Ministry of Tourism Villages of the Republic of Indonesia. Cooperation is carried out in terms of village website development, qualified village internet access, promotion and sale of digital-based village products, digital-based village tourism promotion, development of local wisdom-based tourist sites, and creating pleasant tourism with environmentally friendly and culture-based services.

**Source:** East Nusa Tenggara Province Tourism Data (2022)

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## Literature Review

### *Previous Research Review*

Paddison and Walmsley (2018) mentioned that innovation development in the tourism sector is one of the most important factors in increasing the level of socio-economic development. Innovation acts as a real change factor as a result of activity. Then, in tourism development, an analysis is also needed to determine the strengths, weaknesses, opportunities and threats of innovation that have been formed in the tourism development process (Lindström, 2020). The results of Grossi et al. (2020) state that innovation is needed in managing tourism with a new concept based on modernization. However, Pikkemaat et al. (2019) state that in developing the tourism business, synergizing with the government is needed, especially in improving tourism facilities and infrastructure, promotions, or other matters that are sensitive to attracting tourists. Serravalle et al. (2019), in their research analyzing tourism development, stated that innovation based on new public management is a positive thing to do in terms of developing integrated tourism governance (Mahawira et al., 2023).

Liu et al. (2020) narrated that so far, the tourism sector has had a positive and significant impact felt by the community, both at the level of entrepreneurs, actors and the government. The benefits that have been felt include the tourism industry being able to create jobs and new businesses (Putri & Saputra, 2022). Apart from that, people can manage places and other businesses starting from the smallest scale. Meanwhile, Villacé-Molinero et al. (2021) found that in rural areas, there was a change in the economy, which was initially managed traditionally into a modern economy.

Innovation is realized through the creation of knowledge. However, organizations find it challenging to develop tacit or implicit knowledge because it has been internalized over time through expertise, education, and work experience in members' minds (Divisekera & Nguyen, 2018; Pikkemaat et al., 2019). Organizations need to find ways of absorbing tacit knowledge into explicit ways of providing the best service to customers (Booyens & Rogerson, 2019). Divisekera and Nguyen (2018) identify tacit knowledge using observation and then write down the expertise that the researcher asked the informant. Then, tacit knowledge is transmitted through training and stored as a manual document called explicit knowledge (Marasco et al., 2018). Knowledge created through the SECI process is a source of continuous innovation. Organizations that continue to innovate will provide the best service (Bec et al., 2021).

Bressan and Pedrini (2020) explained that the innovations are routine checks and services for high-risk pregnant women about to give birth. This innovation aims to accompany pregnant women from the beginning of pregnancy, childbirth, and postpartum. According to Bassano et al. (2019), experimentation, responses to low performance, feedback, and motivation for improvement affect innovation activities in the public sector. Meanwhile, budget constraints do not influence the innovation of public sector workers (Marasco et al., 2018). Inclusive innovation is needed to involve local communities in the innovation process to reduce inequality and encourage positive transformation (Bec et al., 2021). Especially with innovation in tourism development, there are various determining factors, namely, entrepreneurs and their characteristics, networks, technological developments, and the environment (Saputra et al., 2022).

### *Innovation*

Organizations are seen as open systems involved in acquiring information and knowledge. Information and knowledge are created as the basis for innovation and sustainable competitive advantage (Saputra et al., 2021). Epistemologically, knowledge is created based on an ongoing relationship between tacit and explicit knowledge that encourages the creation of new concepts or ideas (Bassano et al., 2019; Bressan & Pedrini, 2020). Ontologically, critical factors for developing and sharing knowledge lie in the relationships between individuals, groups, and organizations (Serravalle et al., 2019). Thus, the spiral model of knowledge creation shows the relationship between epistemology and ontology of knowledge creation (Arcese et al., 2021).

There are 5 phases of knowledge creation: (1) socialization, sharing tacit knowledge – considered quite critical because sharing knowledge involves different backgrounds, motivations, and perspectives (Pikkemaat et al., 2019); (2) the creation of concepts – intensive interaction between tacit and explicit knowledge, sharing of mental models, organizing independent teams, articulating these concepts through ongoing dialogue in the form of collective reflection (Divisekera & Nguyen, 2018). Shared tacit mental models are verbalized in words and phrases, then crystallized into explicit concepts through various reasoned methods such as deduction, induction, and forced appropriation; in such a phase, it is related to externalization (Booyens & Rogerson, 2019); (3) concept justification, where a new concept created by an individual or team needs to be justified at some point in the procedure and ensuring its usefulness to the organization and society (Carson & Carson, 2018);

(4) building archetypes; and (5) crossing knowledge levels. Justifying concepts, building archetypes, and crossing knowledge levels combines tacit to explicit knowledge through advertisements, patents, products, or services internalized to users. The continuous process of sharing tacit knowledge, creating concepts, building archetypes, and crossing knowledge levels becomes internalized within the organization (Booyens & Rogerson, 2019; Divisekera & Nguyen, 2018; Pikkemaat et al., 2019).

### *Tourism and Development*

Tourism is one of the leading programs of the East Nusa Tenggara provincial government and the Rote Ndao regency government, which must be developed even better. So, tourism will become an industry related to various components (Serravalle et al., 2019). The implementation of a tourism system can work perfectly. It is further said that these elements combine and mutually support one another. Tourism components that play a role in implementing the tourism industry system include the government, tourism services, and the community around the objects (Booyens, 2020; Hoang et al., 2021).

Empirical facts show that the government still dominates tourism development and has yet to be fully realized optimally through collaboration between local governments, the private sector, communities, and academics. Even such collaboration is known to be a determinant factor in tourism development (Makkonen et al., 2018; Serravalle et al., 2019). Serious opinions and studies show that experience factors determine tourism development, tourist behaviour, and the availability of information about tourism destinations (Booyens, 2020; Hoang et al., 2021; Serravalle et al., 2019). For example, Makkonen et al. (2018) argue that the tourist experience and the development of technological typologies are significant in the tourism and hospitality industry. Tourists can choose their next trip destination or make an initiative to promote tourism among other tourists based on this experience and access to sufficient information through technology (Polese et al., 2018).

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## **Methodology**

This study used a qualitative approach using open-ended interview techniques with key informants, focus group discussions, open-ended questionnaires, and open-ended observation. (Saputra et al., 2021). The analysis is the researcher's interpretation because these methods generate qualitative data (Saputra et al., 2019). The targets of this research, as well as the primary research informants,

consisted of the Regent of Rote Ndao, the Deputy Regent of Rote Ndao, the Regional Secretary of Rote Ndao, heads of the Rote Ndao Culture and Tourism Office and heads of sections, and tourists.

### *Data Collection*

Data were collected through in-depth interviews with key informants, focused discussions, participant observation, and document review. The main informant can provide relatively complete information regarding the research objectives. During observation, researchers go to research locations where tourism is to obtain data or information supporting research objectives (Zvezdov, 2012). The research results were discussed again in a focused manner with the primary informants to ensure that the research results were what the primary informants intended. Documentation is obtaining several written pieces of information (documents) relating to research objectives (Jeou-Shyan et al., 2011).

Triangulation and data validation ensured synchronization between the methodologies and data sources. Cross-check data were obtained through various approaches, namely, in-depth interviews, participant observation, documentation, and directly from informants. The FGD technique, which presents delegates from connected parties online, strengthens data validation by triangulating data sources (Nimri et al., 2017).

### *Data Analysis*

The data analysis technique uses the Interactive Analysis Model, which engages in three components: data reduction, data presentation, and conclusion. In the Data Reduction Stage, the research team focused on the field data that had been collected. The data are then selected based on the degree of relevance to the research intent (Saputra et al., 2021). Furthermore, simplifying the selected data, namely, classifying data based on themes: combining scattered data, exploring to recommend additional data. The research team abstracted the rough data into a brief description (Saputra et al., 2022). At the Data Display Stage, the research team presented information in the form of narrative text, which could be summarized as charts, diagrams, and tables as needed. The research team presented information on the research results based on the arrangement that had been abstracted in these forms. Conclusion and verification stage (Saputra et al., 2019). At this stage, the research team tested the truth of each meaning that emerged from the data. The research team carried out the process of interpreting and consolidating the meaning of the data

presented. In this case, it is also necessary to check data that are biased and which need to be discarded so that such does not interfere with the process of conclusion. The three analyses and data collection types are cyclical and interactive (Lasso & Dahles, 2018).

The sampling technique was carried out by purposive sampling. Purposive sampling is a sampling technique for data sources with certain considerations because the person is considered to know best about what the researcher expects. So, it can be determined that the participants in this qualitative research are (1) Heads of the Tourism Office, (2) Managers of tourist sites, (3) Heads of villages where tourist villages are located, (4) Managers of tourism supporting facilities (hotels and restaurants), (5) Digital service providers (Telkomsel), and (6) Representative of the Ministry of Communication and Information of the Republic of Indonesia.

This research was conducted using semi-structured interviews, which took place referring to a series of open questions. This method allows new questions to arise because of the answers given by the resource persons so that during the session, information digging can be carried out in more depth. The stages are:

1. Determining targets, which is useful for directing and providing limits to the questions that will be asked.
2. Making a list of stakeholders who will be interviewed because the people interviewed must be relevant to the target or topic of the interview to be conducted.
3. Making a list of interview questions. The semi-structured method will consist of a list of open-ended questions.
4. Conducting interview sessions naturally and without anyone's intervention because qualitative researchers are independent.
5. Analyzing the results of the interviews. Such needs to be done to synchronize so that all parts are understood.

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## Results and Discussion

### *Description of Tourism Potential in Rote Ndao Regency*

Based on Law No. 9 of 2002, Rote Ndao Regency is one of 21 autonomous areas and one city in East Nusa Tenggara Province. Rote Ndao Regency had 1,280.10 Km<sup>2</sup> and 148,763 people in 2020. Rote Ndao Regency is located at the southernmost part of the Unitary State of the Republic of Indonesia, which has 107 islands, 99 Uninhabited Islands, and 8 Inhabited Islands (The islands of Rote, Ndao, Nuse, Landu, Nusa Manuk,

Usu, Ndana & Dengka). Rote Ndao Regency is located between 10°25' S – 11°15' S and 121°49' E - 123°26' E. Rote Ndao has territorial boundaries to the north by the Sawu Sea, to the south by the Indian Ocean, to the east by the Pukuafu Strait and to the west by the Sawu Sea (Kim et al., 2020; Polese et al., 2018).

The Rote Ndao region has stunning natural tourism potential and promises happiness. The table above shows that this area is surrounded by beautiful beaches and is visited by many domestic and foreign tourists. Coastal areas are the main tourist attraction that presents beauty. The beach arrangements in this area are quite good and clean. Everything is managed based on environmental awareness and sustainability. However, there are still a few villages in this area capable of developing digital-based tourism following the current era of technological development. It was observed that only two villages in this area were developing digital tourism villages, namely, Kolobolon and Baadale villages. These two villages cooperate with the Ministry of Villages, the Ministry of Communication and Information and Telkom Indonesia. The development of tourism in this area has greatly increased after the digital tourism village was developed. So, it is necessary to develop more digital tourism villages for sustainable tourism.

Based on the results of an in-depth interview with the Head of the East Nusa Tenggara Province Tourism Office, the following is stated:

*“The NTT (East Nusa Tenggara) tourism development model is currently still traditional-based and only relies on assistance from the government in managing tourist areas. So far, the tourist area here is not widely known by foreign and domestic tourists because the tourism support facilities are lacking. For this reason, it is time for NTT to improve by adopting a digitalization-based New Public Management model to make it easier to promote and manage tourist areas. Innovation is needed in management, starting from location maps, parking and other digital-based instructions.”*

One of the managers of the tourist area named Laode also stated that:

*“In Rote Ndao, it is necessary to develop a new model of tourism management based on visitor convenience. Meaning, the existing model needs to be integrated with internet-based digital facilities to make it easier for tourists to find tourist sites, make it easier to make reservations, and travel safety. It is hoped that all tourist areas in NTT will be internet-based or digital.”*

Based on excerpts from interviews with the NTT Tourism Service and tourist area managers in Rote Ndao, this indicates that there needs to be a change or reconstruction of the tourism development model in NTT, especially in Rote Ndao. The need for adequate information and digital facilities is the most relevant development option today. Internet and all other facilities have entered the Rote Ndao area, making it easier to install digital facilities. In addition, the management of the Rote Ndao tourism area needs to adopt the New Public Management method in developing digital tourism innovations in the post-COVID-19 pandemic era. New public management-based tourism governance is very helpful in facilitating tourists and tour managers and the local government in making managerial decisions, especially looking at competitive advantages and future tourism directions or what is called sustainable tourism.

Rote Ndao Regency has potential tourism spread across various sub-districts. Tourist destinations in Landu District include the Dead Sea, Thousand Mouth, Kainadi Beach, Tanjung Pukuafu, Raja Johanis House, King Landu Tomb, and Old Anchor. In East Rote Regency, there are Oesosole Beach, Fei Bay, Bajo Beach, Solokaelutu Beach, Mount Lakamola, King Lenggu's House, King Sjian's House, Oepao Kingdom, King Bilba's House. The location of the plane wreck in Fei Bay, Mando'o Hill, which is located in Kuli Village, is rich in agricultural products (Boon Liat et al., 2020; Serravalle et al., 2019).

Tourist destinations in the Pantai Baru sub-district include Ndao Rock Beach, Lelenuk King's Fortress, Nusakdale Beach, Oeledo Beach, Namohudale Beach, Oeo Tour, Nita Tour, Fortress, Niak Cave (Niak Lean), Leak Bauk, Cannon Smashed into King Diu's House. In Central Rote District, there are Termanu Stone, Sosadale Beach, Ofak Rock, Peto Lake, Oe leak Tourist, Savalue Tour, Kaden Spring, Fopo Beach, Mangrove Forest, Batu Termanu King's House, Fortress of The King of Termanu, Hu Ndao (Panglima Nado), Aisele Moledame, and Pouhuk Traditional House. Batu Termanu is located in Nusak Termanu and consists of two stones: husband and wife. In the west is BatuHun as a man, and in the east is Su'alain (Batu Mbadar) as a woman (Arcese et al., 2021; Bec et al., 2021; Booyens & Rogerson, 2019).

Lobalain District: flagpole tour, three hundred steps, Tua Menggelama church, an-Nur Mosque, the house of the King of Rote, the Namu Ndao craft centre, the Oemau Japanese bathing cave, Dombo Beach, the Mokdale Meriam site, buildings left by the Onder Ovdeling residents. South Rote Regency: Saina Cave, Tolanamo Beach Mountains, Nggolo Cape, Nasedale Beach, Seda Lake, Nituk City, one-pole traditional house, eats Raja

Tena Dethan. West Rote Regency: Boa Beach, Nembrala Beach, Lake Oehela, Tongga Beach, Rua Bafa Rua Cave, Tara Ndola Cave, Tene Oen Cave, Tomb of King Oenale Ajobe Giri, Tomb of King Oenale Simon Mesak Giri, and Tomb of King Delha Abner Ndoen (Bressan & Pedrini, 2020; Divisekera & Nguyen, 2018; Marasco et al., 2018).

Nembrala Beach is famous as the largest seaweed producer on Rote Ndao Island and has white sand and worldwide waves. In the afternoon, visitors can enjoy the beauty of the sunset while watching the activities of the seaweed farmers. There are various international standard hotels on Nembrala Beach. Bo'a Beach has the second most giant waves after Hawaii. Every wave season, regional and international class surfing events will be held at Nembrala Beach and Bo'a Beach. Bo'a Beach is even more special with its sea waves, known as "G waves," which are perfect for surfing, diving, or sailing activities. Not only are the waves being chased, but the panorama of white sand, blue sea, and beautiful nature are also the main attractions for tourists. Apart from surfing, visitors can also do other water activities such as swimming, snorkeling, fishing, and visiting Ndana Island.

Southwest Rote District: Thie King's House, Fiulain, Oeseli Beach, Ndana Beach, Sanama Beach, Tua Lake, Nusa Manuk Beach, and Utak Island. Northwest Rote District: the house of the King of Dengka, HUS culture, Oesede beach, Dengka island beach, brown sugar agro-tourism. Ndaonuse sub-district: Ndao beaches, Ndao island, Nuse island beaches, mermaid caves, VOC Cannons, Ndao Nuse marine park, goldsmith Anarai, the tombs of Ndao kings, Japanese forts. Based on the description of tourist destinations and the types of tourism found in the Rote Ndao district, [Table 1](#) presents tourist visits to the Rote Ndao district from 2017 to 2021.

Based on the table, there has been an increase in tourist visits in the Rote Ndao area from year to year. However, the most significant figure increased when a new tourism model was developed, namely, a digital tourism village in 2021. It is proven that two villages that are developing digital-based tourism villages are able to attract visitors very significantly. Until mid-2022, data obtained from tourist visits in Rote Ndao Regency indicated as many as 940 people. The data show that the number of tourists visiting Rote Ndao increased yearly.

**Table 1** Number of Tourist Visits 2017–2021

Year	Visit (Person)
2017	3.110
2018	3.861
2019	4.988
2020	3.606
2021	7.500

Source: Rote Ndao Culture and Tourism Office, 2022

It indicates that Rote Ndao has tourism potential that attracts foreign and domestic tourists. However, in 2020, the number of tourists visiting Rote Ndao Regency decreased due to the COVID-19 pandemic.

Referring to the vision of the Rote Ndao Regency, the mission of the Culture and Tourism Office of the Rote Ndao Regency is to increase economic growth and people's welfare through the tourism sector, which is supported by agriculture and fisheries. Based on the tourism mission, the culture and tourism service has set objectives, namely: (1) to make Rote Ndao a competitive, environmentally sound, and dignified Tourism Destination, (2) to improve the quality of Tourism Object Facilities and infrastructure, (2) to improve cross-sectoral coordination, (3) increase public awareness and participation to love and enjoy existing tourism objects, (4) increase the professionalism of tourism services. The targets are the availability of potential tourism objects and attractions that are ready to be marketed, the realization of cross-sector cooperation networks, the creation of community participation and creativity in developing arts and culture, and increasing tourist visits, both foreign and domestic. From a budget perspective, the allocation of APBD funds for the 2019–2021 fiscal year can be seen in [Table 2](#) below.

Of the 2021 APBD fund allocation, around 70 percent is used for personnel expenditures, and the remaining 30 percent of APBD funds are used for operational activities and tourism development. Of course, the APBD budget for tourism development in Rote Ndao is relatively tiny. Related to this, based on the results of an interview with the regional secretary of Rote Ndao Regency (07 October 2022) the following was stated.

The results of semi-structured interviews with Village Heads in the Rote Ndao area stated that:

*“Tourism in this area does not only focus on the beach area, because it will cause boredom for tourists. It is necessary to make changes and developments in other tourism sectors. In some areas eco-friendly tourism, plantation tourism or other nature tourism has been developed. We should imitate Kolobolon village, which has become a pioneer in the development of tourism based on local wisdom and digitalization. The combination of modernity and local wisdom is a special attraction for visitors to this area. And, it proves that in the Rote*

*Ndao area there has been a significant increase in tourist visits in 2021 and 2022.”*

The head of Kolobolon village in Rote Ndao said that the development of a digital-based tourism village in his village was by establishing collaboration between the Ministry of Villages and Telkom Indonesia.

*“In the development of Kolobolon village, there were many dead ends, especially in increasing the tourism capacity so that visitors could visit it, and they would be satisfied by the natural tourist attractions. In my opinion, saying that the development of natural tourism is sufficient to attract tourists is wrong. It needs development towards convenience so that tourists don't feel disappointed. And, in the end we decided to bring the village ministry here, and it was directed to develop a digital-based tourism village, as well as to collaborate with Telkom Indonesia for internet network fulfillment facilities here.”*

The potential for natural tourism in Rote Ndao is very qualified and has the widest opportunity to be developed. Various innovations can be developed here. For example, what has been done is innovation in environmental management at tourism locations based on sustainability (people, profit and planet), innovation in organized and digital-based parking systems, innovation in internet-based hotel and restaurant reservations, as well as innovation in map-based tourist locations. All types of development require concrete cooperation between villages, local and central government and the general public. This digital tourism development model must be developed in other tourism areas in Rote Ndao, so it is necessary to reconstruct the traditional tourism model by integrating local wisdom and modernization (digital-based).

Tourism in Rote Ndao has enormous potential for the Regent's vision and mission. Moreover, there are still many tours that can be encouraged to become leading tours. However, tourism development in Rote Ndao must be borne by more than the government and the community because of the small regional revenue and expenditure budget (APBD) (Bassano et al., 2019; Bec et al., 2021). Therefore, tourism development must be appropriately managed if the funds come from the APBD. The Department of Culture and Tourism must provide a detailed plan for tourism development and

**Table 2** The total allocation of APBD funds for the department of culture and tourism for 2019-2021

No.	Year	Ceiling Amount (Rp)	Information
1	2019	6.789.607.200	Including the Salary of State Civil Apparatus (ASN)
2	2020	6.860.065.540	
3	2021	3.390.075.060	

**Source:** Rote Ndao Culture and Tourism Office (2021).

its contribution to regional own-source revenue. However, with a small spending budget, tourism development will be less than optimal, and therefore, assistance from investors is needed (crowd system) so that local governments act with others.

### *Model on Innovation in Tourism Development in Rote Ndao*

Based on the research results, it was found that there are several models in tourism development in Rote Ndao Regency. First, the existing model for tourism development in Rote Ndao district is carried out formally, driven by the Culture and Tourism Office of Rote Ndao Regency through delivering tourism information at various government events at the village, sub-district, district, provincial, and national levels. Tourism promotions were also carried out in the form of booklets and brochures, conveying tourism information in official events, both outgoing visits and arrivals of guests, participating in tourism promotion events at the provincial and national levels, allocating regional revenue and expenditure budgets (APBD) in implementation of tourism programs and activities (Booyens, 2020; Hoang et al., 2021; Makkonen et al., 2018). Also, inviting investors to develop tourism by constructing hotels in the Nembrala beach area and several other places (Boon Liat et al., 2020; Kim et al., 2020). The village head of Baadale stated in a semi-structured interview that:

*“Digital Tourism Village is a new concept in tourism development. In this context, technology is one of the main pillars in building a sustainable and technology-based tourism industry in villages. Along with the development of information technology, villages in Indonesia are starting to transform and adapt to the times.”*

Furthermore, the Head of the NTT Provincial Tourism Office stated his support for the development of a digital-based tourism village in Rote Ndao:

*In order to build Sustainable Tourism in the village, there are several stages that must be passed. These stages include planning, implementation and evaluation. Each of these stages must be carried out well so that the goals of sustainable tourism can be achieved. Technology-based village is a form of digital tourism village concept. Technology-based villages have an important role in creating a sustainable and technology-based tourism ecosystem in villages.*

Digital applications and platforms are one of the keys to building a sustainable tourism industry. Therefore, this

application can be used to promote tourist destinations, sell tour packages, and provide information about tourist villages. In addition, this application can also be used to maintain environmental sustainability by educating tourists about local wisdom and eco-friendly travel procedures. Digital platforms also have an important role in developing Technology-Based Tourism. This platform can be used to facilitate interaction between tourists, tourist village managers and local communities. This will create positive synergism and strengthen the tourism ecosystem in the village. The Sustainable Tourism Industry is one of the goals of developing a digital tourism village. Villages in Indonesia have great potential in developing the tourism sector. However, the biggest challenge is how to build a tourism industry that is able to survive in the long term and not damage the surrounding environment.

The model in tourism development in Rote Ndao Regency is realized by determining the Structure of Tourism Development, Scope of Development Planning, and Development Approach. The development structure is based on object zoning, which is grouped into two Object Development Clusters (CPO) according to Rote Ndao Regent Regulation Number 48 of 2015 concerning Tourism Village Areas in Rote Ndao Regency: (a) CPO I is an area where foreign tourist activity has been seen, especially beach tourism with the attractiveness of surfing, diving and fishing from the aspect of the scope of tourism development planning, namely, the development of tourist areas, development of information and promotion systems, development of tourism supporting facilities/infrastructure, development of human resources (HR Apparatus and Community HR), development of tourism institutions, development of community participation, development of cooperation (between levels government, sectors, and government, business world, and society), development of funding sources for tourism programs (Battour et al., 2022; Kim et al., 2020; Romão & Nijkamp, 2019).

The results of in-depth interviews with owners and managers of tourism support facilities (Hotels and Restaurants) in Rote Ndao suggest several things related to innovation in tourism development in Rote Ndao and NTT in improving digital tourism villages, namely:

*“The use of digital applications and platforms also helps in improving the quality of tourism services and experiences provided to tourists. In this way, tourists will feel more satisfied and have the potential to return to visit the tourist village. The success of using digital applications and platforms in building Sustainable Tourism in Villages is very dependent on the involvement of*

*local communities. Communities must be given an understanding of the importance of technology in developing tourism in their villages, as well as given training in using digital applications and platforms.”*

Digital Tourism Villages or Technology-Based Villages that adopt digital applications and platforms will be better prepared to face competition in the tourism industry. In addition, the use of this technology will help in creating new jobs and improving the quality of life of local communities.

Based on the approach, tourism development in Rote Ndao Regency is, namely, the community-based approach, sectoral-based approach, spatial-based approach, and political-based approach (Bassano et al., 2019; Hoang et al., 2021; Kim et al., 2020). The government carries out tourism development programs, tourism marketing, tourism destinations, and partnership development. The program is realized in the form of the construction of Sarpras for objects of tourist attraction (ODTW) sourced from general allocation funds (DAU), special allocation funds (DAK), and regional incentive funds (DID), organizing training to increase HR capacity in the field of tourism, coaching for art galleries through the development of dance arts, providing gong assistance to artists, facilitating tourism business places to take part in the cleanliness, health, safety, and environmental sustainability (CHSE) certification process by the Central Government, providing full support for the Nirwana lake destination in the award event Pesona Indonesia (API) Award 2021, designates Oeseli Village and the Thousand Mouth Area as an Estate Tourism Destination by the East Nusa Tenggara provincial government (Battour et al., 2022; Makkonen et al., 2018; Polese et al., 2018).

Second, the innovation model in tourism development in Rote Ndao Regency is realized by creating the official website ROTENDAOKAB.GO.ID containing information, among other things, about the tourism of Oeseli Beach, Nirwana Lake, Nembrala Beach, Bo'a Beach, Thousand Mouth Beach Labyrinth, Natural Fort Laviti Beach, Dead Sea Lake, Tolanamon Beach, Oesosole Beach, Mando'o Hill, flagpoles from the Dutch era, and the Termanu stone. That differs from the research of Romão and Nijkamp (2019), which emphasizes the importance of having a physical building as an information centre to maximize tourism in Semarang. The innovation in tourism development in Rote Ndao Regency is based on the vision and mission and various policies and programs of the Rote Ndao district government in the tourism sector, with various evidence of achievements, as stated above (Weidenfeld, 2018).

Excerpts from an in-depth interview with an internet service provider in the village, namely, Telkom Indonesia through its head of marketing, state that:

*“Technological infrastructure is an important factor in building sustainable tourism in digital tourism villages. Thus, this infrastructure includes internet networks, geographic information systems (GIS), and remote sensing technology. Therefore, this technological infrastructure is really needed to support the use of the digital applications and platforms described previously. A good and fast internet network will make it easier for tourists to access information about the tourist village. In addition, the internet will also make it easier for the local community to promote tourism villages and establish cooperation with related parties.”*

Geographic information systems (GIS) and remote sensing technology can be used to monitor environmental conditions in tourist villages. This technology will help in identifying potential negative impacts of tourism activities, as well as finding appropriate solutions to overcome these impacts. Good technological infrastructure will influence the success of sustainable tourism development in the village. Therefore, the government and local communities must work together in building and maintaining existing technological infrastructure in tourist villages. Technology-based villages that have good technological infrastructure will be better prepared to face the challenges that exist in the tourism industry. Apart from that, this technological infrastructure will also help in improving the quality of life of local communities.

Tourism development is in line with the Regent and Deputy Regent programs, in which tourism development is supported by agriculture and fisheries so that the community in Rote grows. Tourism development has only recently resumed due to the COVID-19 pandemic, which hit in 2019 (Putri & Saputra, 2022). Tourism in Rote has many destinations, approximately 114, some of which are the mouth of a thousand and Lake Nirwana, which has extraordinary beauty (Saputra, 2021). To support tourism, the government is intensively promoting and repairing roads to access tourist attractions. In addition to tourism development in Rote Ndao, the government is also encouraging MSMEs to be more active. In terms of capacity building through government MSME training in collaboration with Bank NTT as a partner, this is done so that the community can avoid becoming spectators in their area. The view of the deputy regent of Rote Ndao was reinforced by the head of the Bank NTT Rote Ndao

branch in an interview (10 October 2022), who stated that Bank NTT has partnered with the government in tourism development and has several programs to support MSMEs in Rote Ndao. The NTT bank always invites these MSME groups to display their work when events are organized by the government and by the NTT bank itself (Aquino et al., 2018). The growing development of tourism in Rote, of course, will improve its economy. Therefore, Bank NTT has prepared pro-capital provision programs for these MSME business actors to actively move the economy in Rote (Ratten, 2020; Yeh et al., 2019).

The Department of Culture and Tourism has introduced a tourism development model that relies on a team of creators and has created an official website, namely, ROTENDAOKAB.GO.ID. This team designs innovative models that consider the different situations and descriptions provided. The innovation in tourism development in Rote Ndao Regency is based on the vision and mission and various policies and programs of the Rote Ndao district government in the tourism sector with various evidence of achievements as stated above (Prima Lita et al., 2020; Weidenfeld, 2018). Internally, technically, the Culture and Tourism service stated that innovation is carried out through a knowledge-creation process built on cooperation between the promotion and cultural departments of the Rote Ndao culture and tourism office. The role of the leadership (head of the culture and tourism service) in this case acts as providing direction and discretion to the heads of these sections to then jointly build shared ideas based on data and information both internally and externally in tourism development (Aquino et al., 2018; Pencarelli, 2020; Ratten, 2020). A group of creators was established so that IDR 20,000,000 (twenty million rupiahs) from the APBD money from the Department of Culture and Tourism was used to hire IT professionals to develop digitization (web) tourism. An application for developing tourism through digitalization was produced, namely, “Explore Rote - Rote in Your Hands,” which can be accessed through the Android/mobile phone Play Store by anyone, both foreign and domestic tourists. This digitization of “Explore Rote – Rote in Your Hand” is the essential differentiating element from the existing model in tourism development in the Rote Ndao district. However, there are limitations to the “Rote–Rote application in Your Hands”; namely, the information provided is not yet detailed and not integrated. In the future, it is essential to integrate digitalization into tourism in the context of developing the tourism industry. Despite the existing limitations, the initial steps of digitizing tourism in Rote

Ndao Regency have started. This application’s limitations result from limitations in the APBD of the Rote Ndao culture and tourism service, as described in Table 2 above (Weidenfeld, 2018; Yeh et al., 2019).

Third, the hybrid model is a combination of the implementation of the existing model and the digitalization model in tourism development in Rote Ndao Regency, as well as a solution to the challenge of budget constraints (Pencarelli, 2020; Prima Lita et al., 2020). The challenges faced mainly relate to the agency’s budget because the tourism office has been merged into the Culture and Tourism Office (Sigalat-Signes et al., 2020). Future planning is needed with various justifications, especially given the projected growth in the tourism budget. In addition, it is essential to maximize human resource capability through various offline and online training initiatives involving agency cooperation. Another challenge is building tourism awareness (tourism-minded) among officials and the community (Iglesias-Sánchez et al., 2019). Minded tourism is not entirely optimal; this can be seen from various parties related to tourism, and the community is still waiting. The relatively high mobility of society may cause this condition. The orientation from Rote Ndao to Kupang is critical because the frequency of sea transportation is quite adequate. In one day, a minimum of two fast ferries sail for approximately two hours, and one slow ferry travels for four hours for a relatively affordable price.

Based on the results of in-depth interviews with representatives from the Ministry of Communication and Information of the Republic of Indonesia, it was found that:

*“Digital Tourism Village is a new concept in tourism development in Indonesia. This concept combines technology and the principles of sustainable tourism in building a technology-based tourism industry in villages. Utilization of digital applications and platforms, as well as good technology infrastructure, is the main key in creating a sustainable and technology-based tourism ecosystem in the village. Sustainable Tourism Development in Villages requires close cooperation between the government, local communities, and related parties. Through an integrated approach, digital tourism villages are expected to have a positive impact on the environment, society and the economy in the village.”*

Excerpts from the interview lead to support for the establishment of a digital tourism village in Rote Ndao.

This new model of a tourist village is strongly supported by all levels of society and the government. Technology-based villages that have successfully implemented digital applications and platforms, as well as good technology infrastructure, will be better prepared to face competition in the tourism industry. In addition, this technology will help create new jobs and improve the quality of life of local communities. Good planning, implementation and evaluation are very necessary to achieve the goals of Sustainable Tourism in the Village. Each of these stages must be carried out seriously so that the goals of sustainable tourism can be achieved.

The Ministry of Communication and Information also commented on the innovative model of tourism development in Rote Ndao, which is based on digital tourism villages, namely:

*“Digital Tourism Villages are one solution in building a sustainable and technology-based tourism industry in villages. The government and private sector need to improve infrastructure and services in remote villages to encourage economic growth and quality of life.”*

The results of interviews with the head of the promotion department (KABID) of the Culture and Tourism Office of Rote Ndao Regency revealed several challenges in developing tourism in Rote Ndao Regency, namely:

1. The challenges of information system development and promotion.
2. Challenges in developing human resources (apparatus and community resources).
3. The challenges of developing tourism institutions.
4. The challenges of developing community participation.
5. Challenges in developing cooperation (between governments, sectors, the business world, and society).

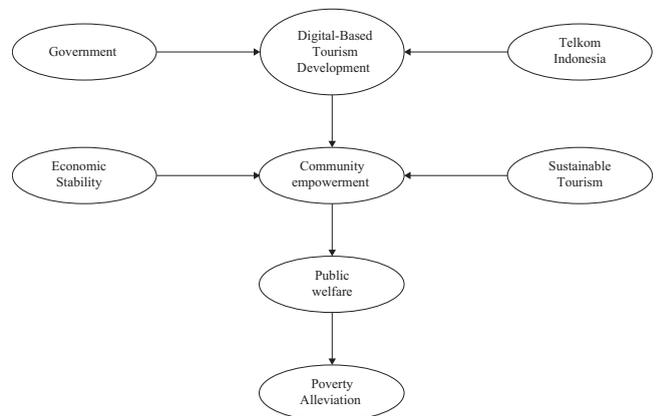
The Regent of Rote Ndao, Assistant 2, revealed a similar picture during study conversations. Being a community leader has its challenges. On the other hand, PT. B a Development and other investors have leased tourist attractions, particularly those on the beach near Nembrala, for 30 (thirty) years by Memorandums of Understanding with the Regional Government of Rote Ndao and PT. B a Development Number HK.09 of 2011 and Number 01/NK/BO’A-KRN/IX/2011.

Resorts and hotels in the Nembrala Beach area are all owned by investors. The condition will be a dilemma because many locals are only spectators. Meanwhile, the construction of resorts in this area also tends to conflict with the rules whereby a distance of 100 m from the beach is state property. No development is allowed, but what happens on the ground is contrary to these rules, where resort development only leaves more or less

15 meters from the beach (Kim & Shim, 2018; Wu, 2020). The local administration has resolved the issue, but the implementation has not been successful (Labanauskaitė et al., 2020; Pencarelli, 2020). Based on the statement, this situation occurred because the investors who owned these places kept them private, attributing to market segmentation. Such situations of market segmentation need to be addressed as they reduce public space for local communities (Aquino et al., 2018; Sigalat-Signes et al., 2020).

Based on the results of field research, it is known that there has yet to be any direction to tourist destinations. Of course, the transportation agency’s authority is related to inter-agency authority, namely, providing facilities for indicating tourist destinations (Casais et al., 2020; Labanauskaitė et al., 2020). In the context of tourism development, the collaboration between agencies is undoubtedly needed. In addition, innovation in tourism development can be carried out through government cooperation with competent community or private parties. There are tourist destinations that have not been appropriately managed. The government’s task is to facilitate infrastructure development in various tourist destinations. Of course, expensive investments are needed, and with limited budgets, investors are needed, both domestic and foreign (Garay et al., 2019; Razzaq et al., 2021). Key informants stated that tourism development was felt to be a “responsible/crossroads” whether government programs were prioritized to meet the basic needs of the community or tourism development (Casais et al., 2020; Hjalager et al., 2018).

Based on the results obtained from semi-structured interviews, the innovation of the Rote Ndao tourism development model can be described as follows in [Figure 1](#).



**Figure 1** Rote Ndao Tourism Development Model Innovation  
**Source:** Summary of research results (2023)

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## Conclusion and Recommendation

There are several models of tourism development in Rote Ndao District. First, the existing or conventional model is carried out formally by determining the structure of tourism development, the scope of development planning, and the approach to tourism development. The structure of tourism development based on object zoning is grouped into two clusters of object development (CPO), namely: (1) CPO I is an area where foreign tourist activity has been seen, especially beach tourism with surfing, diving, and fishing attractions), (2) CPO II is a potential tourism area but not yet developed such as the uniqueness of marine biota, natural beauty, and unique natural environment. From the aspect of the scope of tourism development planning, namely, the development of tourist areas, development of information and promotion systems, development of tourism supporting facilities/ infrastructure, development of human resources (HR Apparatus and Community HR), development of tourism institutions, development of community participation, development of cooperation (between levels government, between sectors and between government, business world, and society), development of funding sources for tourism programs. The tourism development approach in Rote Ndao District consists of a community-based approach, a sectoral-based approach, a spatially-based approach, and a political-based approach.

Digital Tourism Village is a new concept in tourism development in Indonesia. This concept combines technology and sustainable tourism principles in building a technology-based tourism industry in villages. The use of digital applications and platforms, as well as good technological infrastructure, is the main key to creating a sustainable and technology-based tourism ecosystem in villages. Sustainable Tourism Development in Villages requires close collaboration between the government, local communities and related parties. Through an integrated approach, digital tourism villages are expected to have a positive impact on the environment, society and economy in the village. Technology-based villages that successfully implement digital applications and platforms, as well as good technological infrastructure, will be better prepared to face competition in the tourism industry. In addition, this technology will help in creating new jobs and improving the quality of life of local communities.

Digital Tourism Villages realize the innovation model in tourism development in Rote Ndao Regency as one solution for building a sustainable and technology-based

tourism industry in villages. The government and private sector need to improve infrastructure and services in remote villages to encourage economic growth and quality of life. The recommendations offered from this study are: in the future, an increase in the tourism budget, in particular, needs to be well prepared with various rationalities. In addition, it is essential to improve human resource capability through a mixture of offline and online training programs as well as interagency cooperation. The necessity of collaborative tourism, partnerships, and like-minded travel. The significance of research on developing structures based on knowledge generation processes, methodologies, and object zoning in the growth of tourism.

The policy implications aimed at the government and tourism actors, namely, Tourism Villages, as one of the drivers of the regional economy, of course, must continue to move during the COVID-19 pandemic, which is still not over. Because of this, it is necessary to prepare standard operating procedures (SOPs) that must be carried out by actors/managers, visitors, and the government so that the standard of governance for tourism villages is quite clear. Practical implications highlighting the potential of existing regions are aimed at tourism actors and digital tourism villages. Along with the development of an all-digital era, tourism village managers also need to change conventional tickets to e-tickets. It is necessary to implement an e-wallet to minimize physical contact.

The government carries out programs for tourism development, tourism marketing, tourism destinations, and partnership development. The program is realized in the form of building infrastructure for tourist attraction objects (ODTW) sourced from general allocation funds (DAU), special allocation funds (DAK), and regional incentive funds (DID), organizing training to increase human resource capacity in the tourism sector, coaching towards art galleries through the development of dance arts, providing gong assistance to artists, facilitating tourism business places to take part in the cleanliness, health, safety, and environmental sustainability (CHSE) certification process by the Central Government, providing full support for the Nirwana Lake destination in the award event *Pesona Indonesia (API) Award 2021*, Oeseli village and the Thousand Mouth area, which have been designated as Estate Tourism Destinations by the East Nusa Tenggara provincial government.

Second, the innovation model in tourism development in Rote Ndao Regency is realized by creating the official website [ROTENDAOKAB.GO.ID](http://ROTENDAOKAB.GO.ID). This website contains information about some tourist destinations in Rote Ndao

Regency. Digitalization-based tourism is also being developed, namely “Explore Rote - Rote in Your Hands,” which can be accessed through the Android/mobile phone Play Store by anyone, both foreign and domestic tourists—the digitization of ROTENDAOKAB.GO.ID and “Explore Rote – Rote in Your Hand” are essential differentiating elements from the existing model. Third, the hybrid model combines the implementation of the existing model and the digitalization model in tourism development in Rote Ndao Regency, as well as a solution to the challenge of budget constraints.

The recommendations offered from this study are: in the future, an increase in the tourism budget, in particular, needs to be well prepared with various rationalities. Human resource capabilities must be improved through offline and online training programs and interagency cooperation. The necessity of collaborative tourism, partnerships, and like-minded travel. The significance of research on developing structures based on knowledge generation processes, methodologies, and object zoning in tourism growth.

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### Conflict of Interest

The authors declare that there is no conflict of interest.

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