



# Development of Educational Tourism in Tanjungan Reservoir, Mojokerto Based on Renewable Energy

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**Abstract.** Tanjungan Reservoir is a favorite tourist icon in Mojokerto. This tourist object has the potential for water, sunlight, garbage, and wind, which can be used as learning media for renewable energy. The research aims to describe tourists' views when educational tours using renewable energy are built in the Tanjungan Reservoir. This research methodology used a non-probability sampling technique with a purposive sampling type. The number of samples was 399 respondents. Respondents were the Tanjungan Reservoir tourists. The results of this descriptive study indicate that most tourists are Mojokerto people. Tourists are interested in learning about educational tours based on renewable energy that will be built in the Tanjungan Reservoir. Most tourists are still unfamiliar with the natural potential of water, sunlight, garbage, and wind, which can be optimized into electrical energy. This form of electrical energy can replace conventional raw materials for electrical energy.

**Keywords:** ecotourism · educational tourism · electrical energy · renewable energy

## 1 Introduction

Tanjungan Reservoir Tourism is located in Tanjungan Village. Tanjungan Village is located in Kemlagi District, Mojokerto Regency, East Java Province, an area bordering Lamongan Regency. This tour has existed since 1981 and is managed by the village government and the local Bumdes. The reservoir area covers 40 hectares, of which 19 are reservoirs, and 21 are forest areas. Green and shady forest trees decorate this reservoir. The number of tourists on weekdays is around 100–200 people per day, while on Saturdays, Sundays, and holidays it can reach 1000–1500 people per day.

There is a natural potential in the Tanjungan Reservoir that has not been optimized to produce energy. Energy obtained from nature, with the term renewable energy. Energy sources include sunlight, water, wind, and biomass (garbage). These four energies are in the Tanjungan Reservoir. Sunlight, water, and wind can be obtained from the water from the reservoir and the surrounding area. Garbage can be collected from stalls around the reservoir, tourist supplies, and trash from the Tanjungan people.

Today, the government is intensively providing insight and outreach to the public about using alternative energy. The energy in question is renewable energy, as is the natural potential of the Tanjung reservoir. Renewable-energy technology will be developed into educational tourism in the Tanjung reservoir. The use of renewable energy sources in a tour can attract more tourists as well as a means to increase public awareness and knowledge of the importance of renewable energy. Tanjungan Village has ecotourism (environment-based tourism), namely the Tanjungan Reservoir.

This study aims to determine the views of tourists about the development of renewable-energy educational tours in the Tanjungan Reservoir. Forms of renewable-energy educational tourism will be designed and made according to the needs of tourists in the Tanjungan Reservoir.

## 2 Literature Review

Government Law No. 30 of 2007 [1] concerning renewable energy states that its sources are produced from sustainable energy sources originating from geothermal, wind, bioenergy, sunlight, water flows, and waterfalls, as well as the movement and temperature differences of the sea layers. The concept was introduced in 1970. Renewable energy comes from sustainable natural processes, such as sunlight, wind, water, biofuels, and geothermal. This confirms that the energy source is available. Renewable energy sources need to be appropriately managed [2]. This energy does not harm the environment because it does not contribute to climate change and global warming. This is the main reason why renewable energy is closely related to environmental and ecological issues [3].

Education is all planned efforts to influence other people, individuals, groups, or communities so that they do what is expected by educational actors [4]. Everyone needs education, so an exciting delivery method is needed so that the educational process can run optimally.

According to [5], tourism is a journey or a series of activities carried out voluntarily and temporarily to enjoy tourist objects and attractions. The characteristics of the tour are as follows: (a) Temporary. The time needed to travel is short term, where tourists will return to their place of origin, (b) Involve tourism Stem components, for example, transportation facilities, accommodation, restaurants, tourist Stem attractions, souvenir shops, and others, (c) Generally, it is done by visiting tourist objects, and tourist attractions, (d) Have a specific goal, the point of which is to have fun, (e) Not to make a living in tourist destinations. The presence of tourists contributes income to the community or area that is visited [6].

Educational tourism or edutourism is a program in which tourists visit a tourist location to gain a direct learning experience with the tourist object [7]. This educational tourism activity is interpreted as an educational (learning) activity and is packaged as a fun tour. This experience is created through a fun learning process that feels like traveling. According to the Directorate General of PHKA, edutourism is a diversification of tourist attractions from tourism nature (ecotourism), which aims to expand and reproduce the product of nature tourism [8]. Edutourism is a derivative or a sub-type of natural tourism object (ecotourism), so the concept of developing edutourism is similar to ecotourism.

McGladdery & Lubbe [9] state that educational tourism is a form of tourism that combines recreational and educational activities as a tourism product that has an element of learning. Educational tourism can be combined with various other things and serve various tourist interests [10]. The learning process in this educational tour aims to satisfy curiosity in a tool work process, add insight into language, culture, art, music, architecture, folklore, and empathy for the natural environment, landscapes, flora, and fauna, or deepen the appeal of cultural heritage and historical places.

Edutourism has components like ecotourism, namely the components of facilities and services. According to Wood [11], the characteristics of edutourism facilities and services, given the types of ecotourism facilities and services, are as follows:

1. Protect the surrounding environment, both in the form of the natural environment and local culture,
2. Has minimal impact on the natural environment during its construction and operation,
3. In accordance with the cultural and physical context of the local area, for example, marked by architecture that blends with the shape, landscape, and color of the local environment,
4. Reduce water consumption and use sustainable alternative ways to obtain additional water.

### 3 Methodology

The type of research used was descriptive research with qualitative approach. Primary data obtained directly from respondents (Tanjungan Reservoir tourists) were 399. The sampling technique for this study was non-probability sampling. Qualitative data collection was conducted by interviews with the village government, Village-Owned Enterprises, and tourists. Secondary data was collected from studying various documents and literature related to this educational tourism research.

### 4 Results and Discussion

Table 1 shows that the majority of tourists come from Mojokerto. This can be stated that Tanjungan reservoir tourism is well known among the Mojokerto people and is also starting to be visited by tourists outside Mojokerto (40%). The tourists were females (65%) aged 31–50 years. This age range is the age of productive workers. This data is supported by the dominance of tourists' occupations as employees, entrepreneurs, or traders who have routine daily activities. It can also be assumed that tourist income per month is included in the upper middle level.

Table 1 also shows that tourists have received formal education. Most tourists were high school graduates (75%) and university graduates (14). Based on these data, it provides an ideal gap to optimize the educational insight of tourists in enjoying the form of educational tourism. Educational tourism developed in the Tanjungan reservoir is in the form of renewable energy education tours. The educational background of these tourists provides enthusiasm and confidence that this new tourism object, a renewable energy educational tour, can be enjoyed by tourists. Tourist insights related to renewable energy are described in Table 1.

**Table 1.** Description of Respondents

Information		Qty	Information		Qty
Gender	Female	257	Occupation	Government	9
	Male	135		Employee	91
Origin	Outside Mojokerto	158		Labor	37
	Mojokerto	255		Retire	5
Age	< 20 year	39		Military	0
	20–30 year	71		Farmer	23
	31–40 year	159		Entrepreneur	47
	41–50 year	102		Others	169
	> 51 year	28		Education	Primary school
		Junior high school	79		
		Senior high school	219		
		University	57		
		Others	7		

Table 2 shows tourists' understanding of energy in LPG and gasoline. Tourists aged 31–50 years are almost unfamiliar with wood and kerosene as energy to be used for their daily needs. Urban people use LPG for kitchen purposes and gasoline as motor vehicle fuel. Tourists already know that energy is not only in the form of LPG and gasoline, but energy can be produced from sunlight, water, wind, and biomass (waste) (72%). Tourists do not understand that the four energies are renewable energy. The term renewable energy is also unfamiliar to tourists. The interesting thing and an opportunity to be developed are that tourists are also interested in knowing about renewable energy through educational tours. Educated tourists and a desire to know about this renewable energy educational tour support each other. In the next stage, Tanjungan Village can prepare for the development of renewable energy educational tours.

Tanjungan reservoir tourism includes edutourism. The area includes the utilization area of the Lake Tourism Park; in addition to this, Tanjungan reservoir tourism has characteristics such as educational tourism and ecotourism, where natural reservoirs and forests are still being maintained. The shape of the buildings around the tour is temporary, such as culinary stalls surrounding the reservoir. This culinary stall is a complement to tourist facilities. There are minimal permanent physical buildings, such as a stage for presenting tourist attractions. The tourist attractions held are a local culture which aims to attract tourists.

Efforts to develop new tourism, namely renewable energy education tourism, strongly support the ecotourism concept in the Tanjungan reservoir. This reservoir water is used to irrigate agricultural land. However, in the dry season, the reservoir water is insufficient for agricultural irrigation. The action is to pump water from springs around the reservoir using renewable energy from sunlight and flow it to the reservoir.

**Table 2.** Tourist Knowledge of Renewable Energy

Information		Qty
Energy used at home	Wood	26
	kerosene	4
	LPG	394
	Gasoline	316
	Others	2
Knowledge of energy forms from sun, water, wind and waste to produce electricity	Yes	287
	No	112
Know renewable energy	Yes	101
	No	297
Interested in visiting renewable energy education tours	Yes	374
	No	24

Waste and garbage from this tourist attraction are obtained from fallen dry leaves and garbage from the surrounding stalls. Educational tourism aims to manage waste and organic waste into energy to produce electricity, called biomass.

The design of an educational tour in the Tanjungan reservoir is in the form of a booth. There are four permanent booths built around the reservoir. Each booth contains miniatures and infographics for solar power generators (PLTS), Wind Power Plants (Bayu) (PLTB), Hydro Electricity (PLTA), and BioMass/Biogas Power Plants (PLT BioMassa). This infographics explains how renewable energy can be turned into electrical energy, while the miniature of the tool provides a physical form for the process where renewable energy is created. This 2x3 meters booth will surely not damage ecotourism in the Tanjungan Reservoir.

These four booths and educational tourism facilities in Tanjungan Village are placed on the Tanjungan reservoir. This educational tourism marketing needs the role of POKDARWIS (Tourism Awareness Group). POKDARWIS is a community under the Management of Bumdes (Village-owned Enterprises). This POKDARWIS is tasked with managing village tourism, including this educational tour. Individuals who join POKDARWIS must be able to understand the educational object that is being developed into a tour. This educational tour is a process of a learning experience for tourists. POKDARWIS is tasked with serving tourists by providing knowledge so that they can stimulate tourists towards renewable energy. POKDARWIS' skills in providing this service are very influential in creating tourist satisfaction with educational tourism. Before educational tours are offered, the village-owned enterprises need to equip POKDARWIS with product competence and how to serve customers optimally.

The development of this educational tour can also be used as a learning tool for researchers related to renewable energy and edutourism. In the long term, this educational tour, a derivative concept from ecotourism, will stimulate tourists and stakeholders to protect the environment and sustain the development of the local area.

## 5 Conclusion

This research shows that tourists in the Tanjung Reservoir are very relevant to develop new tourism objects in the Tanjung Reservoir. The new tourism that is being built is educational tourism on renewable energy. The condition of the Tanjung reservoir is also very supportive of educational tourism. This new tour is believed to be able to be enjoyed and understood by tourists, referring to the fact that the majority of tourists' recent education is at the senior high school level. The results from this study also stated that tourists are interested in visiting if there is a renewable-energy educational tourism object.

The design of this educational tour in the Tanjung reservoir is in the form of a permanent booth built around the reservoir. Four booths describe PLTS, PLTB, PLTA, and PLT BioMass. POKDARWIS (Tourism Awareness Group) manages this renewable-energy educational tourism activity. This educational tour is a learning experience for tourists and researchers related to renewable energy and edutourism. Renewable-energy educational tourism is a derivative concept of ecotourism to protect the environment and sustain the development of the local area.

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