

Conference Paper

Environmental Management Model in Coastal Area (Case Study of Ekopesantren al-Khairat Palu Sulawesi Tengah)

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Abstract

This study aims to determine the environmental management model in coastal areas based on ecosystems; Al-Khairat Islamic Boarding School in Central Sulawesi, Case Study. Optimizing environmental conservation is done through many factors, and religious elements become one of these factors; religion becomes a way to shape the character of its adherents in protecting their environment. Islam as a religion has teachings that direct its supporters to protect the environment adequately so that the instructions are in harmony with the concept of environmental conservation. This research uses *ekopesantren* theory with several indicators. First, the pesantren policy that carries out environmental management by utilizing the land to create artificial forests. Utilization is based on agroforestry, agro silvopasture and agro fishery approach. The zone of mangrove forest utilization can help food security and environmental preservation in the boarding school environment. The existence of an artificial lake as a water catchment area supports efforts to conserve water in boarding schools. It also serves as a water reserve through rainwater collection so that it can minimize the occurrence of flooding. Second, participatory activity-based environmental development policies. Islamic boarding schools make *santri* as an aid team in overcoming natural disasters and ecological disasters to minimize environmental damage, social impacts, and economic losses. The environmental management model carried out by the Al-Khairat Islamic Boarding School in Palu in the coastal area and geographically crossed by the equator, can reduce environmental damage and can be used as a role model in disaster mitigation and eco-implementation implementation.

Keywords: environmental management, Coastal area, ekopesantren

Introduction

Public awareness of the importance of environmental conservation tends to increase, and this is supported by the existence of state institutions from the center to the regions and the presence of environmental conservation community organizations in various places. But this has not been parallel with the rate of environmental damage. Therefore, more effective solutions are needed for the community to care more and love the surrounding environment. (Malek *et al.*, 2014) Proactive solutions should target the younger generation because they will play an essential role in the future. Environmental education becomes a necessity to increase the awareness of young people towards the environment. One of the media in educating the younger generation, mainly Muslim young age on the importance of environmental preservation is through Education in Pondok Pesantren or Islamic Boarding Schools (Aulia *et al.*, 2018).

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Pondok Pesantren is the oldest educational institution in Indonesia, which existed before the birth of the modern education system. Several pesantren have been established and act as essential institutions that are actively involved as institutions that are close to the community around the pesantren.

The number of Islamic boarding schools in Indonesia is 28.98428.984 with 4,290,626 students. Islamic boarding schools have a strategic position in educating the next generation, especially among Muslims. As an independent, non-governmental Islamic educational institution, Islamic boarding schools contribute significantly to environmental preservation, both now and in the future. This is based on his efforts in educating cadres of students to be able to answer the challenges of life with their religious knowledge, including environmental expertise in it.

Seeing the potential of the pesantren, the Ministry of Environment of the Republic of Indonesia launched the Ekopesantren program since 2008. The Ekopesantren Program gave awards to pesantren who were actively involved and had initiatives and innovations in environmental conservation. The definition of ekopesantren refers to two elements. *eco* or *eko* - which was adapted into Indonesian - with the connotation closely related to ecology, which is the study of the interaction of living things with the surrounding natural environment. While the pesantren is a typical Indonesian Islamic educational institution with various elements in it, namely: *pondok*, mosque, teaching classical books, *santri* (student), *ustadz* (teacher) and *kiyai* (the chief). Ekopesantren can be defined as an effort to label "environmentally friendly" or green at the stage where the pesantren can show its contribution or participation in environmental conservation or conservation (Sudirman, 2012).

Pesantren-based environmental management offers environmental management that is directly practiced by an Islamic Education Institution in carrying out activities to conserve and protect natural resources and the environment, which became known as ekopesantren. Pesantren-based environmental management is considered as one of the effective environmental management because Islamic boarding schools can act as essential and flexible institutions that are actively involved as institutions that are very close to the communities around the pesantren because it can be considered as a node of cultural encounter and cultural broker for the flow of ideas of modernization from the city (Abdurrahman, 2016). So that the pesantren-based environmental management can be useful for the area around the boarding school and as an example of environmental management for the community.

Based on the results of existing research, researchers provide new arguments for the concept of Ekopesantren with the development of ekopesantren theory. The development theory is used as material for analysis, which is strengthened by data found in the field in support of the new argument (Aulia, Isnaini, & Khumairoh, 2017). This study develops the theory of environmental management models based on the pesantren; this theory is called the ekopesantren theory. Ekopesantren is a pesantren that practices conservation and protection of natural resources and the environment with indicators, First, Geography Factors. Secondly, the pesantren's policies are concerned with and are cultured in the background. Third, the development of an environment-based curriculum. Fourth, namely the development of participatory-based environmental activities. Fifth, management of supporting facilities for pesantren that is environmentally friendly (Aulia, 2018).

This research takes a case study in Al-Khairat Islamic Boarding School in Palu, Central Sulawesi. The background of the location taking was due to Al-Khairat Islamic Boarding School in Palu, Central Sulawesi, which carried out environmental management which was influenced by geographical conditions, climate and weather around the boarding school. Palu City as the capital of Central Sulawesi Province is located in the area of the Palu valley plain and the Palu bay. The area consists of five dimensions, namely the mountains, valleys, rivers, bays, and oceans. Astronomically, Palu City is between 0 °, 36 "-0 °, 56" South Latitude and 119 °, 45 "- 121 °, 1" East Longitude, so that it is precisely on the Equator with an altitude of 0-700 meters above sea level. The total area of Palu City reaches 395.06 square kilometers which is divided into eight districts. The location of Palu City is shaped extending from east to west consisting of lowlands, undulating plains, and plateaus. Based on the topography, it is divided into 3 altitude zones, namely: *first*, part of the western part of the east side extends from north to south, east to north and north of the west side extending from north to south is a

lowland/coast with an altitude between 0-100 m above sea level. *Second*, the western part of the west and south side, the eastern part to the south and the north to the east with an altitude between 100-500 m above sea level. Third, the mountainous region with a height of more than 500 m above sea level. The equator crossing the northern peninsula in Central Sulawesi makes the climate of this region tropical. But unlike Java and Bali and parts of Sumatra, the rainy season in Central Sulawesi is between April and September while the dry season is between October and March. Temperatures range from 25 to 31 ° C for plains and beaches with humidity levels ranging from 71 to 76%. In mountainous regions temperatures can reach 16 to 22°C.

Palu City Plain is surrounded by mountains and beaches. The altitude map noted, 376.68 Km² (95.34%) of the Palu City area was at an altitude of 100-500 meters above sea level, and only 18.38 Km² (46.66%) was located in the lower plains. Palu City is located in the northern part of the equator, making Palu City one of the driest tropical cities in Indonesia with rainfall of less than 1,000 mm per year.

Palu is a city with a significant rainfall. Even in the driest month, there is a lot of rain. This climate is considered to be Af according to the Köppen-Geiger climate classification. In Palu, the average annual temperature is 26.8 ° C. In a year, the average rainfall is 1432 mm.

With the climate and weather conditions around it, the Al-Khairat Islamic Boarding School can still conduct environmental management based on pesantren which is quite effective in overcoming environmental problems; also helps the surrounding community in overcoming environmental obstacles. This research is focused on observing aspects of pesantren's policies on caring and sophisticated environment and the development of participatory-based environmental activities in ekopesantren theory.

Research Detail

This research is a qualitative study, so the data collected comes from interview texts, personal documents, memorandum notes, field notes, and other official documents. This study aims to describe the empirical reality behind the phenomenon in-depth, in detail and thoroughly. Source of data comes from primary data and secondary data. Primary data uses data in the form of observations, interviews, and questionnaires to get direct information about the concept of environmental management based on pesantren. Secondary data used to strengthen the findings and complete information that has been collected through interviews with Islamic boarding schools, consisting of 1 head of boarding school / Kyai, 5 (five) teachers, five students, and three managers of boarding schools, two people (local society). Besides that, the data also comes from reading sources and various other sources consisting of books, journals and official documents from multiple agencies. Also supported by attachments from official bodies such as data from ministries, study results, theses, dissertations, historical studies and so on.

Data collection techniques used in the form is observation, interviews, documentation and data analysis. This observation is used for research that has been planned systematically about the concept of environmental management based on pesantren. In-depth interviews were conducted with members of the pesantren, including Ustads, Santri, *Kiyai*, and surrounding communities. The author's written notes are sourced from observations, photographs, and records of activities and supporting facilities and infrastructure in Islamic Boarding Schools. Data analysis was performed after using data collection techniques, namely processing and analyzing data using descriptive-qualitative analysis.

Result and Discussion

The findings of environmental management in Al-Khairat Islamic boarding school in environmental preservation based on local environmental conditions are as follows:

The Aspect of Development Policy of Pondok Pesantren

One crucial indicator in the management of pesantren-based environment is the existing policy at Islamic boarding schools. The boarding school policy accommodates the principles of preserving environmental functions for the development of boarding schools. This can be observed from the vision of Al-Khairat Islamic Boarding School, which is to give birth to generations who can continue propaganda throughout the country and can coexist with nature.

The vision of an environmentally friendly boarding school, also supported by the ideals of the founder of the boarding school that made a policy to create a forest zone, by planting trees around the boarding school to protect the surrounding environment. Also the policy by creating an artificial environment through a reforestation approach, the efforts of the Al Khairat Islamic Boarding School in realizing eco-friendly environment, can also be seen in carrying out environmental management in coastal areas and managing artificial forest resources, so that Islamic boarding schools become habitable places and educational institutions that are able to produce Islamic leaders that are useful for the community and the environment.

In the aspect of environmental management technical policy, the researcher focused on the environmental management of the Al-Khairat Islamic boarding school in Palu which is by the geographical conditions of the Islamic Boarding School in the Coastal Area. This is shown in the artificial environmental management approach, which is; reforestation, protection, and reforestation in the area of the 34ha boarding school which was carried out since the establishment of the boarding school. The benefits of the existence of an artificial forest in boarding schools are as a water conservation area, where during the rainy season it can function as a water catchment; whereas during the dry season it is able to provide a source of water for the surrounding communities. Artificial forests also function as green open spaces, which in addition to having an environmental function, also have a role as a social environment as a place for public areas to study and interact between the boarding school community and communities such as in the form of religious activities (environmental propaganda). Besides, this green open space has become a place for the socialization of waste banks.

An artificial forest located in Pesantren is divided into three Zones of utilization area, as the table below:

Table 1. Zones of Forest Use Areas

<i>Utilization Zone</i>	<i>Wide (ha)</i>	<i>Types of vegetation (source: infaq and pondok pesantren)</i>	<i>Benefits</i>
Agroforestry	10 ha	Agarwood with vegetable, long beans, chilies, cassava	<i>santri</i> food needs but some are also sold
Agrosilvopastur	10 ha	Rubber and agarwood with goats, cows, buffaloes and chickens	Food needs and sold for the needs of developing boarding schools
Agrofishery	10 ha	Rubber and agarwood with tilapia fish, carp and pomfret	Food needs and sold for the needs of the development of Islamic boarding schools
Mangrove	4 ha	Rhizophora mucronate dan Rhizophora stylosa	Withstand the rate of abrasion of the coast and boarding schools

Third, the use zone of artificial forest areas as a source of livelihood (livelihood) in Islamic boarding schools by utilizing food sources available in the boarding school environment. It also functions as a circulation of the food chain ecosystem, such as vegetables, fish, meat and tubers undergoing flow, where

energy transfer events from producers to consumers, then to decomposers that occur continuously. In this ecosystem, living things have their respective roles, some have a role as producers, consumers, and some have a role as decomposers or decomposers.

While one mangrove utilization zone is in the coastal area, covering an area of 4 ha with an average depth of 10 meters. The mangrove utilization zone has been planted since 2013 by *santri* and *ustadz*. The treatment is carried out using hoes and other traditional tools routinely every Sunday.

For the management of artificial forest areas, the Islamic Boarding School forms a *santri* organization called the environmental task force (Satgas) whose duty is to protect and preserve the forest. The activity is regularly carried out every Saturday with the distribution of tasks announced every Saturday night at the Pesantren mosque after evening prayers. Task Force consisting of students, religious teachers and residents formed as part of the concern of boarding schools in protecting the coastal environment from coastal abrasion.

The Task Force was formed specifically to protect, care for, and conserve mangroves such as by replanting mangroves that are damaged / dead. Some *santri* are assigned on certain days by the head of the boarding house to maintain the cleanliness of the lake which serves as a place for collecting raw water for the needs of the residents of the cottage. Cleaning is done by cleaning the lake from weeds, lotus and water hyacinth.

The benefits of artificial forests managed by the Al-Khairat Islamic boarding school in Palu can be felt directly by the Islamic Boarding School and the surrounding community. With increasing environmental support, the Tsunami disaster that struck Palu City and its surroundings in September 2018 did not have a significant impact.

The Aspect of Development Policy of Environment-Based Extra-Curricular Activity

The second focus of this research is participatory activity-based environmental development policy. In this case, Islamic boarding schools channel the abilities of students in the field of disaster management through the formation of the Disaster Task Force. This Task Force is a participatory activity unit owned by Al-Khairat Islamic boarding school in Palu, Central Sulawesi as a response to Islamic boarding schools for disaster management, both disasters originating from environmental problems and natural disasters. The disaster task force has not only become extracurricular for *santri*; but also makes students able to play an active role in the surrounding community; such as volunteering in carrying out community rescue activities from natural disasters caused by the earthquake and tsunami and mitigating environmental hazards as a result of forest fires and coastal abrasion. Also, it also becomes a rescue action unit (SAR) in protecting the environment around pesantren.

Conclusion

Based on the indicators and aspects studied, Al-Khairat Islamic Boarding School has applied the concept of eco-schools by optimally managing the environment. This was indicated by. First, the pesantren policy that carries out environmental management by utilizing land to create artificial forests based on the zone of the utilization of the forest area through the approaches of agroforestry, agrosilvopasteur, agrofisery, and mangrove forest use zones in helping food security and environmental preservation in boarding schools. The existence of an artificial lake has supported efforts to conserve water in Islamic boarding schools, which function as water reserves and rainwater reservoirs to minimize the occurrence of floods; and also as a water catchment area.

Second, a participatory activity-based environmental development policy. The pesantren has made *santri* as an aid team in overcoming natural disasters and environmental disasters so as to be able to minimize environmental damage, social impacts and economic losses.

The environmental management model carried out by the Al-Khairat Islamic Boarding School in Palu in the coastal area and geographically crossed by the equator can reduce environmental damage and can be used as a role model in disaster mitigation as well as a model of implementation of the ekopesantren.

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