



CONSERVATION VALUE OF *GUNUNGAN WAYANG KULIT PURWA* FOR SCIENCE LEARNING MATERIALS

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DOI: 10.15294/jpii.v12i3.42870

Accepted: July 26th, 2023. Approved: September 29th, 2023. Published: September 30th, 2023

ABSTRACT

This study aims to explore the concepts of ecology and biodiversity, the value of environmental preservation in *gunungan wayang kulit purwa*, and its correlation to science learning or environmental education in a science subject at the junior high school level to increase environmental awareness. This research employed a qualitative descriptive approach. This research included ethnographic research associated with symbolic interpretation in anthropology. The informants of this study were a puppeteer (*dalang*), a javanology expert, a *gunungan wayang kulit purwa* creator, and a biodiversity expert chosen by purposive sampling. Data were collected through semi-structured interviews, literature reviews, and content analysis. Data triangulation was applied to ensure the data validity. The data were analyzed using a spiral analysis model, including managing, reading, marking, describing, classifying, interpreting, and visualizing data continuously. The study results show that the *gunungan wayang kulit purwa* contains the conservation value and concept of ecology and biodiversity. This concept has a correlation with the material on ecology and biodiversity in the independent curriculum in a science subject at schools. The ecological concept includes biotic and abiotic components, symbiosis, pollinators and predators, food chains, food webs, competition, and the value of environmental preservation. The findings in the form of a link between ecological concepts and biodiversity in the *gunungan wayang kulit purwa* have implications for the potential use of *gunungan wayang kulit purwa* as a learning resource for science education in schools or environmental education to increase environmental awareness of the young generation.

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Keywords: biodiversity; ecology; environmental conservation; science learning; *gunungan wayang kulit purwa*

INTRODUCTION

Environmental damage and climate change have significantly affected biodiversity extinction, ultimately influencing the quality of human life (Cianconi et al., 2020; Williams & Newbold, 2020; Manes et al., 2021). Character education, especially those focusing on conservation or caring for the environment, is an effort to preserve

the environment through education. It is essential to foster an attitude of caring for the environment in students (Thomas et al., 2019). It is expected to create a synergistic spatial conservation strategy in the long term, facilitating opportunities for students, scientists, decision-makers, community members, and other stakeholders (Ardoin et al., 2020). Science education, especially biology, is one of the subjects responsible for fostering environmental awareness in Indonesia's education curriculum (Parker & Prabawa-Sear, 2020). The-

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refore, environmental education resources must consistently be enriched and taught meaningfully (Meilana & Fang, 2020). The concept of education, which refers to students' social environment, is also commonly known as sociocultural-based education (Taufiq & Rokhman, 2020).

Environmental education is essential to consistently be campaigned on both formal and non-formal education in Indonesia. Based on an environmental education survey published in the environmental education by Parker and Prabawa-Sear (2020), 9.4% of Indonesian young people answer that environmental problems are entirely the responsibility of the government, and 6% of respondents answer that it is the responsibility of other institutions. This shows that the concern and awareness of Indonesia's young generation regarding environmental problems is very low (Parker & Prabawa-Sear, 2020). The low responsibility for environmental conservation is due to the non-optimal environmental education in Indonesia. Several models of the local approach need to be explored to determine the right way to conduct local education in Indonesia. This research tries to provide a new alternative environmental education by associating it with local cultural arts.

Regarding environmental education learning resources, especially material on ecology and biodiversity, Indonesian people are known to have local wisdom and artistic values reflecting a life that preserves the environment and is in harmony with nature (Kartikawangi, 2017; Jurriëns, 2018). However, due to the rapid pace of modernization and technological advancement in this era, indigenous knowledge and cultural arts are gradually eliminated (Meilana & Fang, 2020). Thus, synthesizing environmental learning with those two elements is believed to be necessary (Atmojo et al., 2018; Suprpto et al., 2021a). In this regard, Wayang is one of the arts with environmental preservation values.

The *gunungan wayang kulit purwa* can be interpreted as a reflection of the topography of Java Island, which consists of various mountains. It also implies the natural state and the existence of plants and animals. The visual structure of the *gunungan wayang kulit purwa* is complex, involving the components of traditional houses, giant figures, ponds, dragons, and various animals and plants (Subiyantoro & Zainnuri, 2017). Hence, researchers perceive that the *gunungan* is a potential object to be studied on its purpose and values, especially those associated with science education and environmental education (Tribot et al., 2022).

Numerous research on the *gunungan wayang kulit* has been carried out by scholars, such as the interpretation of the meaning of the *Gunungan* in *Wayang Sadat* as a visual art learning resource in high schools (Subiyantoro & Zainnuri, 2017), the study of ratios in a review of mathematics and philosophy on the *Gunungan Wayang Cirebon* (Perasutiyo et al., 2022), and the understanding of the symbols of the mountains in *Wayang Kulit* and their philosophies (Loita, 2018). Based on the prior research results, no study focuses on exploring the values of environmental preservation in the *gunungan wayang kulit purwa* and their connection with ecological and biological diversity learning materials.

Based on the analysis of articles related to *gunungan wayang kulit purwa* that has been carried out, this research is very different from previous research. The novelty of this research lies in the way of looking at *gunungan wayang kulit purwa* from an environmental conservation value perspective and linking it to the subjects of ecology and biodiversity in junior high school students. This makes this research very limited and has never been done. This research focuses on three keywords: cultural arts, conservation values, and natural science learning resources (Bennet et al., 2017; Infield et al., 2018). This research seeks to fill in the gaps in environmental education learning resources by reconstructing indigenous knowledge of cultural arts as the primary medium (Parmin et al., 2022).

This research is critical to do; the wealth of interconnected biodiversity and culture must be utilized and preserved by future generations, one of which is through environmental education that uses local cultural arts learning resources. Using local cultural art learning resources inherited from the ancestors is a validation that the ancestors also carried out conservation actions in their previous lives (Vitasurya, 2016). The results of this study will provide a new view that traditional wayang artworks can be a source of learning in science learning environment education in schools.

This research is limited to interpreting the potential values of ecological conservation and biodiversity contained in the mountains of *wayang kulit purwa* so that they can be used as learning resources. Improvisation regarding the impact of using *gunungan wayang kulit purwa* is not included in this study. In addition, it is also hoped that the art of *wayang kulit purwa* can teach students the environmental awareness character so that the existence of *wayang* can also be preserved.

METHODS

This research was conducted using a qualitative approach because the qualitative is deep and natural and interprets phenomena (Creswell, 2013). The research flowchart in Figure 1 displays the research steps in qualitative research design to extract meaning from data. This approach was very suitable because this research was interested in understanding the meaning of ecological value and biodiversity in the *gunungan wayang kulit purwa* (Creswell & Poth, 2018). Ethnography is a methodology closely related to anthropological theoretical principles, such as cultural centrality (Katz, 2019; Wieser & Pilch Ortega, 2020). The ethnography approach was suitable for this research because this research sought to describe cultural arts, namely *gunungan wayang kulit purwa*, in terms of ecology and biodiversity. This study also used the paradigm of symbolic interpretation from anthropology. The paradigm of symbolic interpretation is the symbolic perception of objects as meaningful signs or meaning-making activities for symbols in the context of cultural and social groups (Poon, 2018). This paradigm was very sui-

table for exploring the meaning of each symbol in the *gunungan wayang kulit purwa* (Turner, 1967; Geertz, 1973). Creswell (2013) suggests that researchers can deliberately determine participants or places to study and understand the phenomenon to be studied. This technique is usually called purposive sampling, as presented in Figure 1 (Creswell, 2013). The researchers determined the criteria for informants, including biodiversity expert with criteria: 1) lecture in biodiversity, 2) 10 years experience in research biodiversity, and 3) doctor in biodiversity; Javanology expert with criteria: 1) work in javanology institution, 2) researcher and lecturer in javanology subject with ten years experiences; Puppeteer (*Dalang*) with criteria: 1) hold a bachelor degree on Javanese cultural study or *pedalangan* (Puppetry), 2) 10 years of experience as a puppeteer; Puppet maker (*tukang sungging*) with criteria: 15 years of experience as a puppet maker. Thus, four informants consisted of a creator of *gunungan wayang kulit purwa*, a biodiversity expert, a javanologist and two *dalang*. These experts contributed to help interpret the meanings and symbols found in the *gunungan wayang kulit purwa*.

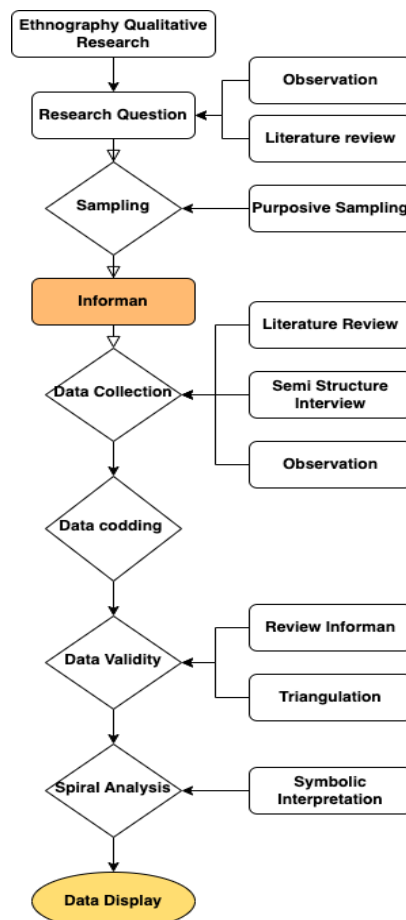


Figure 1. Research Flow

Primary data were obtained from interviews. This study used a face-to-face interview method, which allowed researchers to obtain detailed information and perceptions directly from the participants (Cohen et al., 2013). The researcher went to the studio, office, and puppet-making craft center to conduct interviews. Researchers used the help of voice recording applications on cell phones to help record information in interviews.

The interview was conducted using a semi-structured interview method, which is very suitable for this research (Koster et al., 2016). Semi-structured interviews were chosen because they allowed the informants to disclose comprehensive information and reveal in-depth interpretations of the topic under study; other interview methods cannot obtain this (Cohen et al., 2013).

The researcher created an interview guide to assist the researcher in obtaining a broader answer while still focusing on the objective (Staller & Krumer-Nevo, 2013). The questions asked refers to the guidelines for the questions made (Staller, 2015). The question guide consisted of 10 questions, which are used to explore the symbolic meal behind *gunungan wayang kulit purwa* from an ecology and biodiversity perspective. The interview guide is a set of topic area questions the researcher brings into the interview activities.

Secondary data were gathered using documents dan archives analysis (Staller, 2022). The content analysis used was in the form of photos of *gunungan wayang kulit purwa*, archives both online and in print related to the writings of *gunungan wayang kulit purwa*, and videos of *gunungan wayang kulit purwa* which show the function of *gunungan wayang kulit purwa* in wayang performances.

Subsequently, the data validity was completed by implementing source triangulation and informant review. Triangulation is a data validity checking technique that utilizes various data sources. Source triangulation was conducted by cross-checking the data gathered from informants, places or events, and documents or archives (Koster et al., 2016). Data triangulation continued to be carried out until the data obtained had a high level of validity. Informant review was carried out by returning the data that had been collected and compiled to the informants. Researchers sent copies of data to be reviewed by informants via email. The information could be reviewed to confirm the correctness and suitability of the data (de Los Reyes et al., 2019).

Afterward, the data was analyzed using a spiral analysis model according to the guidelines provided by Creswell and Poeth (2018), also known

as a modification of interactive analysis (Huberman, 1994). The process involved Managing, Reading, Memoing, Describing, Classifying, Interpreting, Representing, and Visualizing Data. The spiral form can be seen in Figure 2 below. Each step is used to analyze the data obtained.

In the first step, the researcher organized the interview data and saved the audio files in the archive that had been made. In the study, after the researcher transcribed this file, there were five archives consisting of three interview files with informants, one document analysis file archive, and one observation file archive (Staller & Krumer-Nevo, 2013). In the second step, the researcher started reading the data repeatedly, tried to make sense of it, and recorded the ideas that emerged. In the third step, the researcher described and classified the data. The data description referred to the meaning of each symbol in the *gunungan*. Furthermore, it was classified on the biotic and abiotic components of the *gunungan wayang kulit purwa* and its ecological functions.

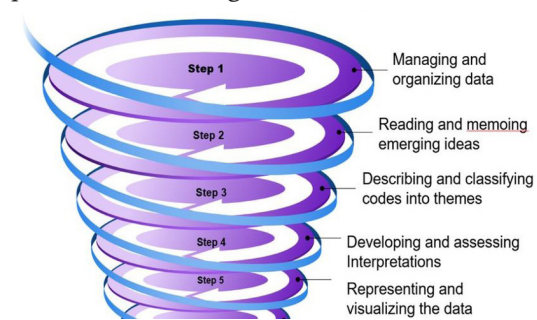


Figure 2. Data Spiral Analyze

Then, in step four, the researcher began to develop the data and interpret the data with symbolic interpretation in Figure 2 (Koster et al., 2016). At this stage, the researcher began to interpret the data sourced from the informant and compare it with other data sources, namely documents, photos, or videos. The researcher tried to explore the visible and hidden meanings of the *gunungan wayang kulit purwa*, especially from the point of view of environmental preservation. In the last stage, the researcher visualized the data obtained. The visualized data could be in the form of pictures, tables, or schemes of the environmental preservation value of *gunungan wayang kulit purwa*.

RESULTS AND DISCUSSION

Wayang is a kind of art frequently performed to entertain the public (Miller, 2019). *Gunungan* is utilized to represent mountains in *wayang* performances. It is shown by a puppeteer (*dalang*) at the beginning, the middle or bet-

ween performances, and the end of the show. Thus, it can be considered a symbol representing the settings of a storyline (Reumont, 2022). Several types of *Wayang* found in Indonesia include *Wayang Kulit Bali*, *Wayang Kulit Purwa*, and *Wa-*

yang Kulit Cirebon. In the context of *Wayang Kulit Purwa*, a Javanology expert, explains that there are two types of *Gunungan*: *Gapuran* (Figure 3) and *Blumbungan* (Figure 4).

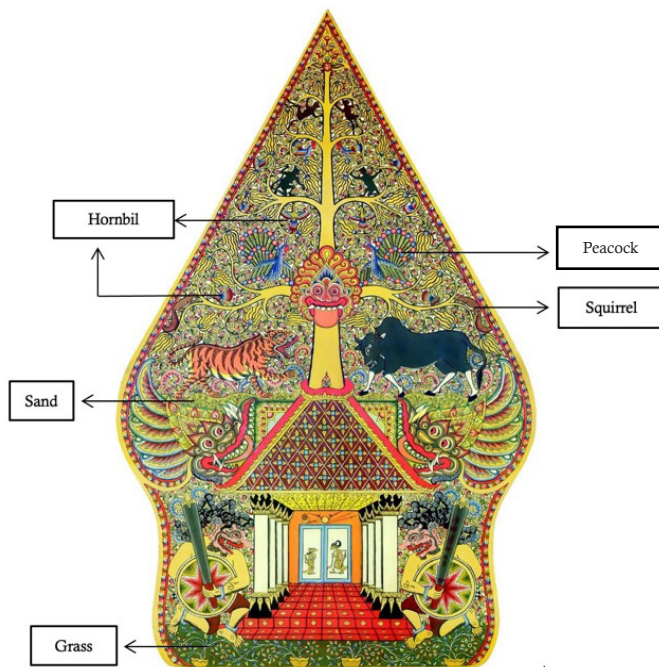


Figure 3. Gunungan Gapuran (Source: IMGBIN.com: gunungan)

Dalang and the puppet maker informed *Gapuran* in Figure 3 is characterized by a gate on the front side of the *gunungan*. Meanwhile, the *Blumbungan* in Figure 4 can be noticed by a water pool on its front side. Furthermore, the *gunungan* is sometimes referred to as a *kayon*/tree,

an interpretation of the image of the *Ficus* tree that dominates the *gunungan wayang kulit purwa*. Moreover, it is also called a *gunungan* because it is shaped like a cone, representing mountains on Java Island.

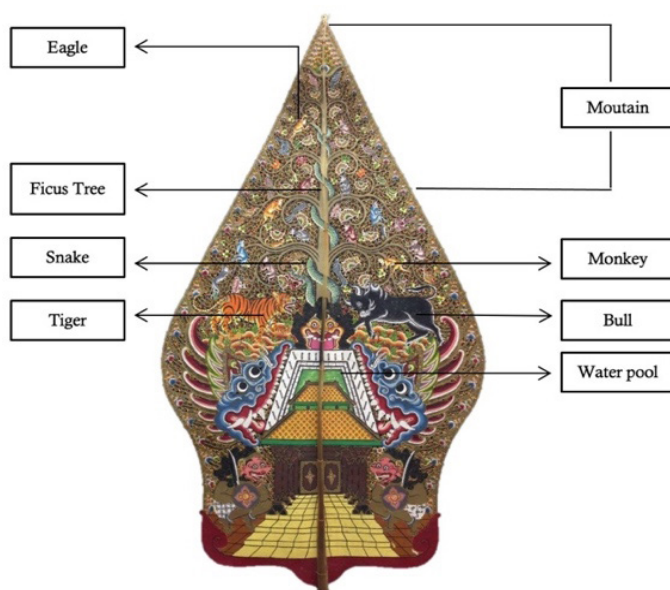


Figure 4. Gunungan Blumbungan (Source: Pinterest.com: gunungan)

Blumbangan is a Javanese term for a pool of water. “*Gunungan Blumbangan*” has a slimmer size when compared to “*Gunungan Gapuran*”. Figure 4 shows the biotic components identified and validated in the *gunungan blumbangan* type, including bison, Javan tigers, snakes, ficus trees, and eagles. Biotic components are also found in the *gunungan gapuran* type. The results of the interpretation and validation of the biotic and abiotic components in the *gunungan gapuran* type are presented in Figure 3, which has almost the same biotic components as the *gunungan blumbangan*. The researchers focus on the different biotic components so that the results of the interpretation of the biotic components are obtained, namely the presence of hornbills, peacock, grass, and squirrels.

Furthermore, the informants add that some specific flora and fauna are chosen to be visualized in the *gunungan wayang kulit purwa* because they are considered the most dominant in their era. Likewise, they are perceived to be symbols of four lusts in Javanese culture: *lauwammah* (biological), *supiah* (worldly), *amarah* (emotional), and *mutmainah* (spiritual). The mountain symbol represents the topography of Java Island, especially

Central Java province, which has several mountains such as Merapi, Merbabu, Ungaran, Sindoro, Sumbing, and Lawu. Moreover, it implies the closeness of people’s lives to mountains (Negara et al., 2021), a water source providing livelihoods for people on the mountain and its slopes (Ali Ikhsan et al., 2018).

Based on the interpretation of the data above, it shows that biotic and abiotic components are found in the *gunungan wayang kulit purwa*. This can be a capital to bridge science education and the environment here with culture. The findings also make this research different from other research, and only this research reveals the meaning of *gunungan wayang kulit purwa* from the environmental education aspect, namely the ecological aspect and the biodiversity found in science class VII subjects.

The interview with a biodiversity expert uncovered that *gunungan wayang kulit purwa* contains symbols of biotic and abiotic elements. In this regard, Table 1 shows the biotic and abiotic components and their functions in supporting the ecosystem. Researchers have tested the analysis results for validity through the informant review involving a biodiversity expert and a puppeteer.

Table 1. Biotic and Abiotic Components in the *Gunungan Wayang Kulit Purwa*

| Symbol/Image | Binomial Nomenclature | Biotic | Abiotic | Ecological Function |
|------------------|---------------------------------|--------|---------|---|
| Grass | <i>Poaceae</i> | v | | Producer |
| Ficus tree | <i>Ficus sp</i> | v | | Producer |
| Javan tiger | <i>Panthera tigris sondaica</i> | v | | Peak Consumer/Predator/ Carnivore |
| Bull | <i>Bos javanicus</i> | v | | Consumer I/Herbivore |
| Monkey | <i>Macaca fascicularis</i> | v | | Consumer I/Polinator |
| Hornbill | <i>Rhyticeros undulatus</i> | v | | Consumer I/Polinator |
| Python | <i>Malayopython reticulatus</i> | v | | Consumer II/Predator |
| Javan hawk-eagle | <i>Nisaetus bartelsi</i> | v | | Peak Consumer/Predator |
| Peacock | <i>Pavo muticus</i> | v | | Consumer I |
| Green junglefowl | <i>Gallus varius</i> | v | | Consumer I |
| Squirrel | <i>Sciuridae</i> | v | | Consumer I/Polinator |
| Water pond | - | | v | Source of nutrition for producers |
| Soil | - | | v | Source of nutrition and a place where the ecosystem takes place |
| Joglo House | - | | v | Human habitation |

In Table 1, the biotic and abiotic components of the *gunungan wayang kulit purwa* are presented. The scientific name or binomial nomenclature and ecological function are added to provide a more detailed explanation of the

biotic and abiotic components found and to strengthen the linkages between ecology and biodiversity material with data from the *gunungan wayang kulit purwa* interpretation. The symbolic content of flora and fauna, including biodiversity

on the mountain in Table 1, illustrates the critical role of a source of basic needs, including food, clothing, genetic resources, and other sustainable life support systems. Moreover, it provides educational benefits and promotes the development of science and technology (Rahayuningsih & Kurniawan, 2020). Fertile soil in mountainous areas can be planted with vegetables that benefit the human quality of life. Additionally, the mountain ecosystem becomes a nature for various animals, as illustrated in the visual structure of *gunungan wayang kulit purwa*, convincing a message to Javanese people, in particular, to preserve mountains due to their necessities for human beings and the survival of biodiversity.

Elements of soil, water, and biodiversity in the *gunungan wayang kulit purwa* represent harmonious relationships of biotic (animals) and abiotic (soil and water) components, somehow reflecting that biotic elements depend on those of abiotic. Abiotic factors (physicochemical matter and energy flow) are always an implicit part of the ecosystem because individuals cannot survive without energy from the sun, the earth, and interactions between biotic and abiotic components (Meulen et al., 2016)

Various flora and fauna (biotic components) in the visual structure of the *gunungan wayang kulit purwa* have a continuous living structure. The flora is known to be producers, while the fauna is consumers (Hu, 2016). They can establish a pattern of food webs to support the continuity of populations and ecosystems (Pollierer, 2021). In this context, grass and banyan trees act as producers. On the other hand, squirrels, buffaloes, monkeys, and hornbills play the roles of consumers I, snakes as consumers II, and eagles and tigers as consumers III (the peak).

The stability of food webs is crucial in transferring energy between organisms in an ecosystem (Kardol et al., 2016). As a result, the involved mechanism demands interdependence. If the population of one of the organisms is disrupted, the other components will likely interfere. For example, if a producer is exposed to toxic or hazardous substances, its role as a producer will move to another consumer above it (Kumar et al., 2020). Hence, it implies the significance of maintaining the resilience of food webs for the environment, producers, and consumers to preserve ecosystems and biodiversity for a better life. The concept of sustainability of the food web of biodiversity presented in the visual structure of *gunungan wayang kulit purwa* is illustrated in Figure 5.

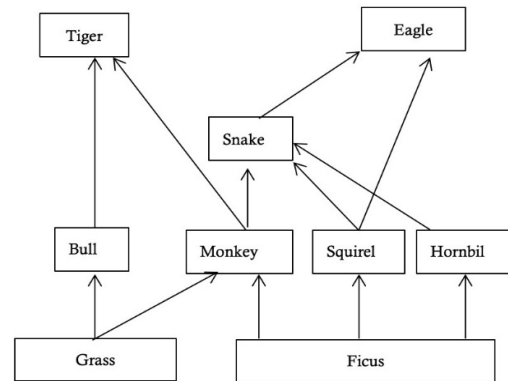


Figure 5. Food Webs in the *Gunungan Wayang Kulit Purwa*

Figure 5 above displays the result of the interpretation and improvement from a critical analysis study by researchers on the biotic components of the *gunungan wayang kulit purwa*. Each component found is analyzed using the concept of biology to find ideas so that the concept of food webs is obtained, which can be used as a learning resource for science education or environmental education, especially on ecology and biodiversity related to art and culture. The analysis results of the food chains and food webs concept in Figure 5 prove that arts and culture can be a source of learning relevant to science subjects in schools, especially on ecology and biodiversity materials.

The image of a Ficus tree dominates the *gunungan wayang kulit purwa*. There is still debate about what species of ficus is in the picture. However, a biodiversity expert and a javanologist reveal that the visual structure of the *gunungan wayang kulit purwa* does not specifically refer to a particular banyan tree but rather to its genus in general. It reflects the characteristics of the tree image on the *gunungan* and the closeness of the Javanese religious community to it. The dominance of the Ficus tree shows that the Javanese people understand the essence of preserving the tree itself. Moreover, the banyan tree is only one of the 750 species of the Ficus genus. It is a plant from the family of *Moraceae* which grows fast in open environments, such as fields or forests.

The height of the banyan tree can reach 40-50 meters with a trunk diameter of up to 100-190 meters. Thus, such diameter and height make it a shady tree with high ecological value. Its large and broad canopy with wide leaves is a shelter for insects and mammals. In addition, many birds also take advantage of the branches and leaves of

the Ficus as an ideal place to perch and lay their eggs (Raji & Downs, 2021). Specifically, in the *gunungan wayang kulit purwa*, animals interacting directly with Ficus trees are hornbills, monkeys, and squirrels. This description is consistent with the conditions in nature, showing that animals that often visit Ficus trees are monkeys, hornbills, and squirrels (Koli, 2016; Sengupta et al., 2020; Chong et al., 2022). Furthermore, the size of the canopy of Ficus trees is also proportional to absorbing carbon emissions and other pollutants harmful to the environment.

Ficus fruit is an essential food source for fruit-eating animals (frugivores). Ficus trees can bear fruit throughout the year, starting from one branch to another (Castañeda-Miranda et al., 2020). The process of fertilization is strongly influenced by temperature and climate. Its abundant fruit sources provide benefits for animals around it. Hence, 92 species of birds, 12 mammals, and 8 types of insects eat Ficus fruit (Raji & Downs, 2021). The relationship between insects and Ficus trees is called mutualistic symbiosis. The Ficus tree has three kinds of flowers: male, female, and insect. An insect flower is a sterile organ used by insects to place their eggs, a form of mutualistic symbiosis in which insects benefit in the form of a food source while they are pollinating the ficus tree (Karamaouna et al., 2013; Liu et al., 2021). As a result, the high ecological value of the Ficus tree makes it a “keystone species” in tropical forest areas.

In addition, the Ficus/banyan tree has a solid lateral root structure. It can hold the soil well and prevent erosion in a vertical state. Moreover, it is also used for storing and absorbing large amounts of water (Karuniasa & Prambudi, 2019), as proven by frequent water sources on Java Island. As a result, its critical role in supporting sustainable ecosystems, especially in providing water resources, makes the Ficus tree often sacred by Javanese people trying to preserve biodiversity.

Another group of animals in the *Gunungan* includes monkeys, squirrels, and hornbills. They are portrayed as staying on the branches and twigs of the Ficus tree and are classified as animals that eat the Ficus fruit (Rahayuningsih & Kurniawan, 2020). Ripe Ficus fruits are moved by animals, making them act as pollinators, helping to spread plant seeds. In this context, pollinators are also called forest farmers because they are vital in spreading plant seeds to various forest areas and eventually growing new plants to maintain forest ecosystems, starting with a succession of Ficus trees (Shafie et al., 2023). In this regard,

the low level of competition and the distance between each other influences the success rate of pollinators (Siviter et al., 2023).

The interview with a biodiversity expert reveals that hornbills have the highest cruising range than other pollinators in the *gunungan wayang kulit purwa*, namely monkeys and squirrels. Hornbills can fly quickly and spread seeds from one forest to another (Lan et al., 2019).

Another group of animals in the *Gunungan* in *Wayang Purwa* ecologically acts as predators, such as tigers, snakes, and eagles. Javanese tigers and eagles are classified as predators occupying the peak position in a food chain (Kinney et al., 2023). Predators existing in a particular ecosystem can compete for prey. Thus, the relationship between predators and prey is often referred to as predation (Dunn & Hovel, 2020). In this regard, predators somehow function as controls to prevent a population explosion of animals with a high reproductive success rate, ultimately stabilizing the availability of producers. In conclusion, such a critical function indicates that animals classified as predators can manage the ecosystem and must be preserved (Doherty & Ritchie, 2017).

The symbolic meaning in the structure of the *gunungan* in *wayang purwa* implicitly confirms that Javanese culture has environmental preservation values. Interdependence relationships convey messages for conserving all forest ecosystem components (Rahman et al., 2021). The role of keystone species acting as pollinators and predators and Ficus trees in an ecosystem could be an essential consideration in future forest and environmental conservation strategies (Kurniawan et al., 2022).

In addition to the connection between individual groups, the message of conservation value is implied in the picture of the relationship between the Ficus tree and the water pond. Ficus trees have solid lateral roots to withstand soil erosion and store water (Rahayuningsih & Kurniawan, 2020). It is proven by Kali (2015), who reveals that the Ficus Benjamina tree vegetation is critical in conserving water resources in East Nusa Tenggara during the dry season (Kali et al., 2015). Another study confirms that Ficus trees can survive significant water stress even in dry seasons (Zafar et al., 2019).

In the independent curriculum, as in the previous curriculum, environmental education is taught through natural science subjects, namely ecology and biodiversity (Suprpto et al., 2021b). Revealing the value of biodiversity and the concept of ecology in the mountains of *wayang kulit purwa* can be a bridge that connects science edu-

cation and environmental education that comes from arts and culture. In the Independent Curriculum, ecology, and biodiversity are taught integratively. In materials on ecology, there are sub-materials such as (1) environmental influences on living things, (2) biotic and abiotic components, (3) energy flows in the form of food chains and food webs, (4) biogeochemical cycles, and (5) interactions between ecosystem components. Meanwhile, materials on biodiversity in Indonesia consist of (1) the distribution of flora and fauna in Indonesia, (2) the threat to Indonesia's biodiversity, (3) the influence of human activities on ecosystems, and (4) conservation.

The material in the independent curriculum is related to findings from the *gunungan wayang kulit purwa* study so that the connections are clear, as presented in Table 2. In the interpretation of the *gunungan wayang kulit purwa*, several values of science education on ecology and biodiversity are found in the *gunungan wayang kulit purwa*.

Table 2. Correlation of Ecology and Biodiversity Material on the Independent General Curriculum with the Interpretation of *Gunungan Wayang Kulit Purwa*

| Ecology and Biodiversity Material in the Independent Curriculum | The Concept of Ecology and Biodiversity in <i>Gunungan Wayang Kulit Purwa</i> |
|---|---|
| Biotic and abiotic components | V |
| Food chain | V |
| Food webs | V |
| Predation | V |
| Niche | V |
| Pollinator | V |
| Conservation values | V |
| Symbiosis | V |

Table 2 shows a list of materials that correlate to each other between ecology and biodiversity material in the independent curriculum with the findings of the concept of ecology and biodiversity in the *gunungan wayang kulit purwa*. The correlation findings are obtained based on a detailed description of the findings from the interpretation of the *gunungan wayang kulit purwa*. These findings answer questions from this study about the *gunungan wayang kulit purwa* messages about environmental preservation and correlates with natural science material at the junior high school level. Based on the findings of the concept

of ecology and biodiversity, *gunungan wayang kulit purwa* can be used as a learning resource and learning media for science education and environmental education. A contextual and meaningful environmental learning atmosphere can be created by using the *gunungan wayang kulit purwa* media in environmental learning or science learning in class.

CONCLUSION

The present research results show a correlation between ecology and biodiversity material in the independent curriculum in junior high school with the concept of ecology and biodiversity in the *gunungan wayang kulit purwa*. It is reflected in the relationship between biotic and abiotic components such as the ficus/banyan trees and water and the dependencies among several ecosystem components known as producers, pollinators, and predators. The conservation values in the *gunungan wayang kulit purwa* and the ecological and biodiversity concepts found can be used as learning resources and environmental education media to increase the sense of responsibility of students and young people towards conservation and sustainable environmental management. The application of *gunungan wayang kulit purwa* can be used as further research to measure the effectiveness and response of students and teachers towards implementing the use of *gunungan wayang kulit purwa* as media in learning science in the classroom.

ACKNOWLEDGEMENTS

Researchers would like to thank the Indonesia Endowment Fund for Education (LPDP) and the Ministry of Finance of the Republic of Indonesia for funding with contract letter number KEP.968/LPDP/LPDP.3/2021 so that this research was completed and the article was written. Researchers are also thankful to Prof. Margareta Rahayuningsih, M.Si., Drs. Imam Sutarjo, M.Hum, puppeteer, and wayang maker who were willing to become the present study informants.

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