The importance of ecocentrism to the level of environmental awareness for sustainable natural resources

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Abstract. Environmental ethics is a reflection of the moral principle between human beings and the natural environment. Ecocentrism, one of the environmental ethics, supports long-term environmental sustainability. This study aimed to determine the roles of ecocentrism toward the level of environmental awareness for sustainable use of natural resources. This descriptive research is to determine the association between the level of environmental awareness and environmental ethics. The study involved 30 students in Biology Education Department. Data were primarily collected using researcher-developed questionnaires. The level of environmental awareness was measured by using the Likert scale (1-5), based on the students’ positive contribution to their local environment in daily life. The problem-based interview was also added to determine which environmental ethics the students stood for (Ecocentrism or Anthropocentrism). The result showed 19 out of 30 students were dominated by anthropocentrism rather than ecocentrism toward the environment. Chi-Square analysis showed that there is no significant association between the level of environmental awareness and environmental ethics. People can have the same level of environmental awareness, but different environmental ethics. Ecocentrism needs to be promoted more in academics for sustainable use of natural resources not only for the present generation but also for the future generation.

Keywords: ecocentrism, environment, natural resources, sustainable

1. Introduction
The increasing levels of technological development accompanied by the growth of the human population over time have increased the use of land, water, energy, mineral, and biological resources of the Earth [1]. This will raise concerns over the future availability of natural resources and the increasing competition to access them. All individuals and nations require natural resources to sustain current standards of living, as well as to increase economic activity [2]. A large population has the potential to conserve the environment as well as destroying it. Human tendency either to conserve or destroy the environment for their needs depends on the human’s perspective on it. This perspective is called environmental ethics.

Environmental ethics studies ethical relationships between human beings and the natural environment, including all nonhuman lifeforms. It decides what is right or wrong with how human beings treat the environment [3,4]. Environmental ethics determines what people think about how

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nature works, what their role should be in the world, and how nature should be valued. There are two types of Environmental ethics which so contrast with each other. Anthropocentrism (human-centric environmental ethics) regards nonhuman lifeforms and natural ecosystems as long as they are valuable for human well-being, preferences, and interests. It has an assumption that only human beings and their interests are ethically considerable. On the other hand, Ecocentrism is the broadest term for world perspectives that recognize intrinsic value in all lifeforms and their surrounding ecosystems, including their abiotic components and stated that nature cannot be reduced to what promotes human well-being. Although ecocentrism has not always been popular among environmentalists, it has challenged conventional ways of thinking about value and morality [4,5,6].

Environmental ethics is about the human perspective toward the natural environment. Besides, environmental awareness is about their real action or choice in the local community toward the natural environment in daily life. Ecocentrism is the key to sustainable natural resources because all environmental judgments based on it have a wider scope than human-centric environmental ethics and provides more long-term and future effects toward the natural environment. Robert Cahn, an environmental ethicist, explains in his book that the main concept of environmental ethic is caring about our planet and all of its inhabitants, protecting them from self-interests, and leaving footprints as smallest as possible on the planet [7]. This leads to the main questions of this study about what role of ecocentrism in the level of environmental awareness and also whether both have a significant association with each other.

2. Research methodology
This study involved the students of Biology Education Department, who had taken the Environmental Science course at Faculty of Tarbiyah and Teacher Training, UIN Antasari Banjarmasin. The lecture discussed the definitions, scopes, types, and principles of environmental ethics. From this study, it was found that the students’ possible role as Biology teachers to be in the future would be highly important in educating their future students about environmental awareness and also their perspective toward the natural environment to achieve environmental sustainability.

A descriptive quantitative approach method was used by focusing to measure the association between the level of environmental awareness and environmental ethics. Data were primarily collected using researcher-developed questionnaires that consisted of 8 statements as shown in table 1. The level of environmental awareness was measured by using the Likert scale (1-5), based on the students’ positive contribution to their local environment in daily life.

| No | Indicators                                                                 | Score |
|----|----------------------------------------------------------------------------|-------|
| 1  | I support the paperless policy and apply it in my daily life.               |       |
| 2  | I do reduce, reuse, and recycle to save plastics                           |       |
| 3  | I bring my grocery bag whenever I go to the market                         |       |
| 4  | Whenever I see any trashes carelessly dumped in my campus or neighborhood, |       |
|    | I will collect and put them into recycle bin                               |       |
| 5  | I help tree plantation/greening program                                     |       |
| 6  | I will turn off the lamp and other electronic devices whenever the class is |       |
|    | used                                                                       |       |
| 7  | I save water whenever I use the toilet                                     |       |
| 8  | I participate in conservation cadre and support environmental protection   |       |

A problem-based test was also added in a form of agree-disagree questions, as shown in table 2, to determine which environmental ethics the students stood for (Ecocentrism or Anthropocentrism). After collecting the data, an analysis was started by validating the questionnaires using the Bivariate
Pearson method. After the instruments are considered valid, the collected data were analyzed using descriptive statistics. The average score for each variable (level of environmental awareness and environmental ethics) was interpreted based on classes in table 3.

### Table 2 Environmental Ethics Test

| Nr | Indicators                                                                 | Agree      | Disagree   |
|----|---------------------------------------------------------------------------|------------|------------|
| A  | I want renewable energy resources to be widely used by people              | Ecocentric | Anthropocentric |
| B  | It doesn't matter if palm oil companies open protected forests for their production activity as long as they have the local government allows it and their wastes are properly treated. | Anthropocentric | Ecocentric |
| C  | Rotating power outage act by the State Electric Company has obstructed users/customers productivity | Anthropocentric | Ecocentric |
| D  | A way to save wildlife is to put them in a zoo                            | Anthropocentric | Ecocentric |
| E  | Natural resources must be used as many as possible for human prosperity   | Anthropocentric | Ecocentric |
| F  | Human beings are the leader of Earth who has the authority to organize and manage by other living beings for their benefits not only for the present but also in the future to come. | Anthropocentric | Ecocentric |
| G  | I admit contributing to the increasing volume of waste on Earth           | Ecocentric | Anthropocentric |

### Table 3 Classification of environmental awareness and environmental ethics

| Environmental Awareness | Average Score | Category   | Environmental Ethics | Average Score | Category   |
|-------------------------|---------------|------------|-----------------------|---------------|------------|
| 1.0 - < 1.8             | Never know before |           | 1.0 - < 1.5           | Anthropocentric |
| 1.8 - < 2.6             | Almost never/very rarely |       | 1.5 - < 2.0           | Ecocentric    |
| 2.6 - < 3.4             | Occasionally/Rare  |           |                       |               |            |
| 3.4 - < 4.2             | Usually/frequently |          |                       |               |            |
| 4.2 - < 5.0             | Always          |            |                       |               |            |

3. Results and Discussion

This section discusses the role of ecocentrism as the best environmental ethic for sustainability to the level of environmental awareness. Environmental awareness is defined as a human’s act or choice toward surrounding ecosystems (includes biotic and abiotic components) based on how they view and value the environment. Washington et al. stated that a social transformation towards ecocentrism was not only an ethical but also a practical imperative, thus any possible supports for ecocentrism understanding and practices were essential for solving the unprecedented environmental crisis [5]. Environmental awareness influenced by ecocentrism is not only limited to the local scale but also capable to spread to a global scale. Recent campaigns on raising awareness toward the impact of climate change are one big example of how ecocentrism can influence a global movement [8].

The educational institutions and students can play important environmental roles in improving the quality of the natural environment in their schools/colleges and local communities [4]. Natural resources of the Earth are decreasing and our environment is being rapidly degraded by human activities. Rather than depend on the local government to perform the clean-up to all existing environmental problems, it would be better for raising public awareness toward the natural environment which can prevent environmental degradation faster than curing the already damaged environment [9]. Education cannot solve environmental problems instantly, but it can rehabilitate
them, because through an ecological education to the young generations it is easier and more economical to prevent the unprecedented environmental degradation than to rehabilitate the currently happening damages by the adult generations [10].

In order to measure how environmental ethics related to the students’ awareness of the natural environment, this study was conducted. The level of environmental awareness was measured by using the questionnaire consisted of 8 indicators which showed how the students treated the local environment in their daily lives. Indicators 1 and 5 would show the students’ responses to whether they cared about the rapid deforestation in Indonesia, especially in Borneo Island. The paperless policy is reflected from the frequent use of papers by students and officials every year. It contrives to reduce the use of papers to protect the forest and prevent global warming. Paperless policy and greening programs contribute to sustainable development. The implementation of both programs defines the responsible use of natural resources thus it will not jeopardize the social and environmental development of future generations [11]. Indicators 2, 3, and 4 promote the 3R program (Reduce, Reuse, and Recycle), mainly plastic waste management. Indicators 6 and 7 determine the importance of clean energy and awareness about water scarcity. Indicator 8 determines humans’ participation in saving wildlife and protecting the environment.

The problem-based test in a form of agree-disagree questions was conducted to explore how deep the students’ perspective toward the environment. Indicator A shows the perspective toward renewable energy. A renewable energy source such as the solar panel may provide long term sustainability, but its recent price is hardly affordable for some people, especially to a developing country like Indonesia. This act requires unselfishness, decreasing unrenewable energy sources, such as fossil fuels, for environmental sustainability in the future. Indicator B shows the perspective toward the expanding number of palm oil plantations in Borneo Island. Anthropocentrism would agree to the statement of Indicator B, as long as the chemical wastes from the companies would not harm the local environment. Even if the palm oil plantation were legal, people with ecocentrism would disagree because they knew that the decreasing forest area would cause the habitat loss of the local animals, the decreasing of species diversity, and the degradation of water reservoirs and carbon storage. Indicator C reflects the frequent power outage act by the local State Electric Company in South Borneo. It shows whether the students acknowledge the importance of saving energy because most power plants in Borneo Island use coals as their energy source. Indicator D is rather a tricky question. It shows whether humans value wildlife and their contribution to the balance of ecosystems. Indicator E clearly shows its favor toward anthropocentrism, using natural resources for economic use without considerable limit. Indicator F shows the students’ view about the essential role of human beings on earth. Indicator G shows if people know where the wastes go after they disposed of them to the trash bin. These series of questions provided how deep were the students' understanding of the impact of their choices for natural resources sustainability in the future.

Based on the data collected from questionnaires, the level of environmental awareness among 30 students varied to Occasionally/Rare (36.67%), frequently (40%), and Always (23.33%). Among those respondents, 19 students viewed the natural environment in the human-centric perspective (anthropocentrism), while the rest 11 students viewed the natural environment in the eco-centric perspective (ecocentrism). Cross Tabulation and Chi-Square tests are shown in tables 4 and 5.

| Environmental Ethics | Ecocentric | Total |
|----------------------|------------|-------|
| Always               | 4          | 7     |
| Usually/Frequently   | 4          | 8     |
| Occasionally/Rare    | 7          | 11    |
| Total                | 19         | 30    |
centrism is mental awareness. It is in line with humanism: Philosophical Aspects of Resources A New Search for an environmental ethic – 2010.

Ecocentrism views environment to be the planet’s most important and dominant species as the Earth’s most important and dominant species were the sole owner of the planet and had all the rights to manage and decide what best in treating the natural environment. Chi-square test showed the value of Asymptotic Significance (2-sided) 0.917 > 0.05 and the value of calculated chi-square 0.173 < chi-square table 5.991. This result proved that there was no significant association between environmental ethics to environmental awareness. It is in line with the statement of Washington et al. that anthropocentrism continues to be the world’s dominant ethic toward the natural environment, even in venues where ecological sustainability is a stated goal [5]. All the people who have widely different environmental perspectives about the world can take the same data, come at quite different conclusions, and be realistically consistent because they start with different values and assumptions [4]. People can develop a high level of environmental awareness, but it doesn’t mean they have the same thinking about how they view the natural environment.

4. Conclusion and Recommendation
This study concludes that people can develop good environmental awareness, but it doesn’t mean they share the same environmental ethics. They care toward the sustainability of the environment and natural resources either because it gives benefits to them (anthropocentrism) or because they are aware that it gives direct as well as indirect benefits not only for themselves but also to all nonhuman living beings and abiotic components in the ecosystem (ecocentrism). Ecocentrism is important for natural resources sustainability as it has a wider scope and also long-term and future effects toward the natural environment. Ecocentrism views environmental health not only about how it affects human beings but also to other living forms and abiotic components of the Earth’s ecosystems. Further study is needed to build a planning strategy to promote environmental awareness with an ecocentric perspective and to create an interest in conservation, such as arranging study groups consists of students to make a school project using ecological footprint analysis and paperless classroom policy.

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Table 5. Chi-square test result

|                        | Value | df | Asymptotic Significance (2-sided) |
|------------------------|-------|----|-----------------------------------|
| Pearson Chi-Square     | .173  | 2  | .917                              |
| Likelihood Ratio       | .172  | 2  | .918                              |
| Linear-by-Linear Assoc. | .052  | 1  | .820                              |
| N of Valid Cases       | 30    |    |                                    |

Based on cross-tabulation in table 4, there were 19 out of 30 students still viewed that human beings as the Earth’s most important and dominant species were the sole owner of the planet and had all the rights to manage and decide what best in treating the natural environment. Chi-square test proved that there was no significant association between environmental ethics to environmental awareness.
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