

'I prefer this because ...': Ecocentric and anthropocentric reasoning in Indonesian children's pro-environmental attitudes



Authors:

Sitti H. Mas'ud¹ Fasli Jalal¹ Elindra Yetti¹ 

Affiliations:

¹Early Childhood Education,
Universitas Negeri Jakarta,
Jakarta, Indonesia

Corresponding author:

Sitti Mas'ud,
sittihabibamasud_
9920921018@mhs.unj.ac.id

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Background: Early childhood is a crucial period during which attitudes and behaviours, including pro-environmental attitudes, begin to form. Understanding the reasons behind children's environmental preferences is important because similar pro-environmental choices may reflect different value orientations. In the Indonesian early childhood context, evidence on how young children justify environmental choices through ecocentric and anthropocentric reasoning remains limited.

Aim: This study aimed to examine how Indonesian children aged 5–6 years expressed pro-environmental attitudes towards pollution, conservation, waste and saving resources and whether their reasons reflected ecocentric or anthropocentric reasoning.

Setting: The study was conducted with 57 children aged 5–6 years in Indonesia.

Methods: A basic qualitative design was used. Data were collected through face-to-face picture-based interviews adapted from the Preschool Children's Pro-Environmental Attitude Scale, and the responses were analysed using content analysis.

Results: Most children expressed positive attitudes towards protecting the environment; however, their reasons were predominantly anthropocentric. More ecocentric responses appeared mainly in relation to animals. The children's explanations also suggested that cognitive development, religious beliefs, parenting practices, parental environmental knowledge and anthropomorphic thinking were associated with the ways they justified their responses.

Conclusion: Indonesian children in the early childhood phase generally expressed pro-environmental attitudes, but these were more often justified in human-centred rather than nature-centred terms. The findings suggest the need for early learning experiences that strengthen ecocentric reasoning across everyday environmental issues.

Contribution: This study provided empirical evidence on pro-environmental attitudes among Indonesian young children and highlighted the value of analysing children's environmental reasoning through ecocentric and anthropocentric perspectives.

Keywords: pro-environmental attitude; early childhood; ecocentrism; anthropocentrism; environmental reasoning; Indonesian children; environmental education; qualitative research.

Introduction

Developing pro-environmental attitudes during early childhood is important because this is a formative period when dispositions, habits and value orientations begin to emerge (Davignon, Poulin & Denault 2023; Mitev et al. 2025; Nguyen & Tran 2025). Early childhood is also a receptive period for cognitive, social, emotional and physical development, during which children begin to form attitudes towards themselves, others and the world around them (Fernandez 2014; Likhar, Baghel & Patil 2022; Mayra, Maulana & Kushendar 2022). In this study, environment refers to children's everyday natural and physical surroundings, especially in relation to pollution, conservation, waste and resource conservation. Environmental issues are multidimensional, and early experiences with them may influence how individuals understand and respond to the environment later in life (Plagg & Zerbe 2021; Scattolin, Resegue & Rosário 2022; Shrestha et al. 2025; Watson et al. 2025). The first years of life are therefore important for the development of attitudes and values that may become part of an individual's longer-term orientation towards the world (Chun et al. 2021; Gamage, Dehideniya & Ekanayake 2021; Scholz-Kuhn et al. 2025; Wang, Gai & Li 2023).

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Children begin to learn about their environment and develop caring responses towards it during the preschool years. Previous studies suggest that when children are not encouraged to engage with environmental issues in early childhood, the development of such attitudes may be weaker later in life (Hoover 2021; Van Heezik et al. 2021; Yang et al. 2022). Environmental attitudes are also significant because they can predict environmentally conscious behaviour and may support self-control in everyday actions (Andersen & Mayerl 2022; Cayolla et al. 2023; Wyss, Knoch & Berger 2022). For this reason, several studies have argued that environmental education should begin early in order to foster environmental awareness and pro-environmental attitudes (Andersen & Mayerl 2022; Cayolla et al. 2023; Wyss et al. 2022). Taken together, these arguments establish the social and developmental importance of studying how pro-environmental attitudes develop in early childhood.

Conceptually, attitude refers to 'the intensity of positive and negative affect toward concepts, persons, ideas, and other 'objects' in general' (Hunter, Levine & Sayers 1976). In relation to environmental issues, Faccioli et al. (2020) and Molnár et al. (2026) explain that environmental attitudes may be understood through positive or negative evaluations of environmental topics, often expressed through preferences, choices and support or lack of support for particular actions. In young children, such attitudes are unlikely to appear only as abstract opinions; rather, they are expressed through responses to everyday situations and, importantly, through the reasons children give for those responses. This distinction is important because a child may choose an environmentally positive action, but the reasoning behind that choice may differ substantially.

A useful framework for examining such reasoning is the distinction between value orientations underlying environmental attitudes. A study by Snelgar (2006) argues that environmental concern is related to three orientations: social-altruistic, egoistic and biospheric values. Social-altruistic orientations prioritise the effects of environmental degradation on others, egoistic orientations focus on consequences for oneself and biospheric orientations emphasise the effects of environmental degradation on ecosystems. A closely related and more directly applicable framework for this study is the ecological paradigm proposed by Thompson and Barton (1994), which distinguishes between ecocentric and anthropocentric perspectives.

Ecocentric reasoning supports environmental protection based on reasons intrinsic to nature itself, whereas anthropocentric reasoning supports it based on the benefits nature provides to humans.

In this sense, ecocentric attitudes prioritise nature itself, while anthropocentric attitudes prioritise environmental protection primarily in relation to human welfare, convenience or safety. These two orientations are important because they allow researchers to distinguish between children who make similar pro-environmental choices but

justify them on different value bases (Thompson & Barton 1994). Later work has also suggested that ecocentric reasoning is more closely associated with stronger environmental commitment, whereas anthropocentric reasoning may be more conditional and benefit based (Herdoiza, Worrell & Van den Berg 2025; Rülke et al. 2020; Topal, Hunt & Rogers 2021). Studies by Aguilar-Luzón et al. (2020); Ciziceno (2023); Patwary et al. (2022) further argue that the distinction between ecocentric and anthropocentric orientations broadly corresponds to the biospheric, social-altruistic and egoistic value orientations.

This framework is particularly relevant for early childhood research. Many studies have shown that children's attitudes towards the environment can be interpreted through ecocentric and anthropocentric perspectives (Ahi, Kaya & Kahrman-Pamuk 2024; Audley, Ginsburg & Furlong 2024; Cho & Choi 2025). These perspectives are useful because they enable us to examine not only whether children exhibit positive environmental attitudes but also the reasoning underlying those attitudes. Previous studies also indicate that both types of reasoning may already appear from an early age (Klijnstra et al. 2023; Liu & Green 2024; Nguyen & Walters 2024; Simsar, Doğan & Sezer 2021). At the same time, these responses do not emerge in a vacuum. Children's environmental reasoning may be shaped by multiple influences, including age, gender, family context, place of residence and sense of ownership (Darling-Hammond et al. 2020; Hosany, Hosany & He 2022; Onstenk et al. 2026; Roman et al. 2025; Yurt & Kara 2025). Accordingly, early childhood research should pay attention not only to children's choices but also to the social and interpretive contexts in which those choices are formed.

Empirically, several studies have examined pro-environmental attitudes among children in the early childhood phase. According to Kahrman-Ozturk, Olgan and Tuncer (2012), for example, 40 children aged 5–6 years from middle socio-economic backgrounds were studied using the Children's Attitude towards Environment Scale-Preschool Version (CATES-PV) (Körükçü & Gülay Ogelman 2015). Their results showed a generally positive orientation towards the environment across dimensions; however, when children explained their reasons, anthropocentric reasoning was more common, and no gender differences were found.

Similarly, Simsar et al. (2021) examined the pro-environmental attitudes of 74 Syrian refugee children using the same instrument and reported that anthropocentric attitudes were more evident in consumption patterns and daily life habits. In contrast, ecocentric attitudes were more evident in environmental protection, recycling and reuse. A study by Li et al. (2024) used the Preschool Children's Pro-Environmental Attitudes instrument, in addition to the CATES-PV, to analyse the environmental attitudes of 138 children aged from 48 months to 78 months and found that empathy towards nature encouraged pro-environmental attitudes in early childhood. Taken together, these studies suggest that early

childhood pro-environmental attitudes are often positive at the behavioural level, but the value orientation underlying them may vary and remains analytically important.

Despite this growing body of work, research on children's environmental attitudes in early childhood in Indonesia remains limited. Existing Indonesian studies mostly report environmental data and/or a small number of indicators of environmental concern but do not analyse children's environmental attitudes through ecocentric and anthropocentric perspectives or examine the factors underlying those attitudes. For example, Nisa et al. (2025); Yusuf and Fajri (2022) focused only on one element, namely waste management. In other Indonesian studies, participants were mostly elementary, middle or college-age students rather than young children (Ayrisa et al. 2020; Mubasyiroh et al. 2025; Rahardi & Dartanto 2021; Rochmawati, Fatmawati & Sukma 2022; Sofyana, Wibowo & Agustiningsih 2022). This indicates a clear empirical and conceptual gap: there is still limited evidence on how Indonesian young children interpret environmental issues and whether their responses are better understood as ecocentric or anthropocentric.

Therefore, this study used the ecocentric–anthropocentric framework to analyse Indonesian children's pro-environmental attitudes across four issues: pollution, conservation, waste and resource conservation. The study aimed to examine how children in the early childhood phase expressed pro-environmental attitudes towards these issues and to identify factors that appeared to shape their responses. Accordingly, the study addressed the following research questions:

- RQ1: *How do Indonesian children in the early childhood phase express pro-environmental attitudes towards pollution, conservation, waste and saving resources in ways that reflect ecocentric and anthropocentric reasoning?*
- RQ2: *What factors appear to influence children's pro-environmental responses in the Indonesian early childhood context?*

Research methods and design

Review design

This study employed a basic qualitative research design to explore how Indonesian children in the early childhood phase expressed pro-environmental attitudes and how they justified their responses. A qualitative design was considered appropriate because the study was concerned not only with whether children selected environmentally favourable options but also with the meanings and value orientations reflected in their verbal explanations (Aluwihare-Samaranayake 2012; Edwards 2010; Léger-Goodes et al. 2023). In this study, children's responses were examined in relation to everyday environmental issues, namely pollution, conservation, waste and saving resources, with particular attention to whether their reasoning reflected ecocentric or anthropocentric orientations.

The analysis was guided by qualitative content analysis, which enabled the researchers to identify recurring patterns in children's responses while interpreting them through a

theoretically informed framework (Meuleman et al. 2025; Naeem et al. 2023; Villamin et al. 2025). This approach was well suited to the study's aims because it allowed children's brief, concrete explanations to be systematically organised, compared across environmental topics and interpreted in relation to the ecocentric–anthropocentric distinction.

Setting and participants

The study was conducted in four early childhood education centres in Pinrang, South Sulawesi, Indonesia: TK Islam Plus E-School, TK Al Barokah, TK Polewali, and TK Negeri Pembina Kecamatan Lanrisang. These settings were selected because they provided access to children in the targeted age group and enabled the researchers to collect data from diverse early childhood education contexts within the same regional setting.

The participants were 57 children, between 5 years and 6 years of age, comprising 31 boys and 26 girls. This age group was selected because children at this developmental stage are generally able to respond to simple, picture-supported interview questions and to provide short explanations based on familiar everyday situations.

Participants were recruited using purposive sampling. Children were included if they were: (1) between 5 years and 6 years of age; (2) enrolled in one of the participating early childhood education centres; and (3) able to participate in a short one-to-one interview in Bahasa Indonesia. Children were excluded if teachers or parents indicated they were unwell on the day of data collection or were unable to engage meaningfully in the interview process.

Written informed consent was obtained from parents or legal guardians before data collection, and verbal assent was obtained from each child prior to the interview. Each child participated individually and was assigned a unique identification code (A1–A57) to protect anonymity.

Instrument adaptation and interview materials

Data were collected through face-to-face, picture-based interviews adapted from the Preschool Children's Pro-Environmental Attitude Scale developed by Li et al. (2024). The original instrument was adapted for interview use because the participants were young children and could not be expected to complete a self-administered questionnaire reliably. The interview format enabled the researcher to present each scenario orally, assess the child's understanding and invite the child to explain their choice in developmentally appropriate ways. As illustrated in Figure 1, the adapted interview covered four dimensions of pro-environmental attitudes, each further divided into specific sub-dimensions relevant to young children's everyday environmental experiences.

The adapted interview covered four dimensions of pro-environmental attitudes: pollution, conservation, waste and

saving resources. Across these dimensions, the instrument addressed 10 sub-dimensions, including air, water and noise pollution; conservation of animals, plants and soil; waste disposal and sorting and energy and paper conservation. Each sub-dimension presented the child with a pair of contrasting visual scenarios, one reflecting a more environmentally supportive option and the other a less environmentally supportive option. For example, in the waste-disposal item, children were shown one image depicting littering and another showing rubbish being placed in the appropriate bin. Children were then asked which situation they preferred and why.

The interview prompts were translated from English into Bahasa Indonesia and linguistically refined to ensure conceptual equivalence and age-appropriate wording. To support children's comprehension of the interview scenarios, each prompt was accompanied by a visual illustration (see Figure 2). The visual materials were designed using Canva and reviewed by two early childhood education experts and two environmental education experts to assess clarity, relevance and developmental appropriateness. Based on their feedback, minor revisions were made to the wording and image presentation to improve children's understanding of the scenarios.

Before formal data collection, the adapted prompts and illustrations were pilot-tested with five early childhood educators of a similar age who were not part of the main sample. The pilot phase was used to identify ambiguous wording, confusing visuals and interview pacing issues. Minor revisions were subsequently made to improve question clarity and reduce potential misunderstanding during the main study.

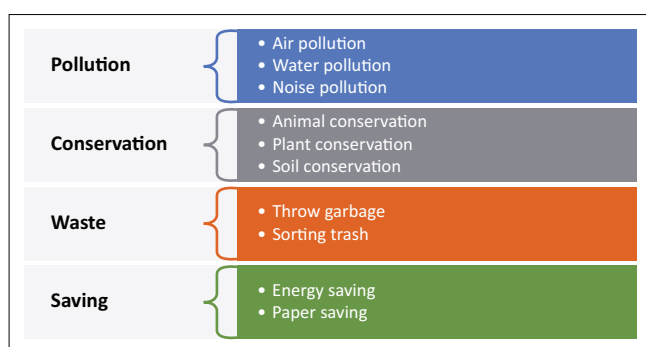


FIGURE 1: An overview of interview question content across the four dimensions and 10 sub-dimensions.

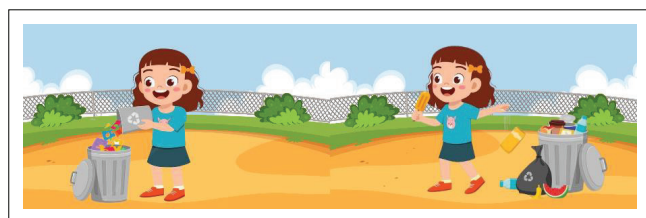


FIGURE 2: Example of a picture-based interview illustration used in the recycling and reusing sub-dimension.

Data collection procedure

Data collection was conducted individually in a quiet and familiar space within each child's educational setting. Each child participated in a one-to-one interview with the researcher. At the beginning of the session, rapport was established through a brief, informal conversation to help the child feel comfortable in participating.

The researcher then presented each picture pair one at a time and asked the child to indicate which situation they preferred. After the child made a choice, the researcher asked a follow-up question, such as 'Why do you prefer that?' to elicit the child's reasoning.

The interviewer used simple, non-leading language and avoided evaluative responses that might influence the child's answers. When necessary, neutral prompts such as: 'Can you tell me more?' or 'Why is that?' were used to encourage fuller responses without directing the content of the explanation. Each interview lasted approximately 10 min.

Children's responses were documented during the interviews through handwritten field notes. The responses were then digitised and organised into a textual dataset for analysis. All identifying information was removed, and each response was linked only to the participant code.

Data analysis

Data were analysed using qualitative content analysis, focusing on both children's behavioural choices and the reasons they provided for those choices. Each child responded to picture-based interview items by selecting one of two contrasting options and then explaining why that option was preferred. Accordingly, the analysis proceeded in two complementary stages.

Firstly, children's selections were tabulated descriptively for each item to identify whether they chose the more pro-environmental or less pro-environmental option within the four dimensions of the study: pollution, conservation, waste and saving resources. These frequencies were used to describe the general direction of children's environmental preferences across sub-dimensions.

Secondly, children's verbal explanations were analysed interpretively using a combination of deductive and inductive qualitative content analysis. Deductively, the explanations were coded using the framework of Thompson and Barton (1994). A response was coded as ecocentric when the child's reason referred primarily to the well-being, protection or intrinsic value of nature, animals, plants, ecosystems or the environment itself. A response was coded as anthropocentric when the child's reason referred mainly to human-centred concerns, such as personal benefit, convenience, safety, comfort, cleanliness for people, avoidance of punishment or usefulness for human purposes.

In addition to these two theoretically derived categories, a third category, do not know, was used when a child's explanation could not be meaningfully interpreted within either orientation. This category was assigned when the child explicitly said that they did not know, remained unable to provide a reason after prompting, gave an irrelevant answer or produced a response that was too unclear to classify reliably. Thus, the reasoning analysis distinguished among ecocentric, anthropocentric and unclassifiable responses.

After the initial coding of value orientation, the explanations were further examined inductively to identify recurring factors that appeared to shape children's responses across cases. Through repeated reading and comparison of responses, themes emerged regarding influences such as cognitive development, religious beliefs, parenting practices, parental environmental knowledge and anthropomorphic thinking. This stage of the analysis primarily addressed the second research question, which examined factors associated with children's pro-environmental reasoning in the Indonesian early childhood context.

All responses were organised by participant code (A1-A57), dimension and sub-dimension. The coded data were then compared across the four environmental dimensions to examine similarities and differences in children's reasoning. This analytic procedure enabled distinguishing between children who made similar pro-environmental choices but justified them on different value bases.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Ethics Committee of the Doctoral Programme in Early Childhood Education, Universitas Negeri Jakarta (No. 89/UNJ-KE/2025). Permission was also obtained from the participating schools. Written informed consent was obtained from parents or legal guardians, and verbal assent was obtained from each child before participation. Participation was voluntary. All responses were anonymised using participant codes, and the data were used only for research purposes.

Results

The children tended to select the more pro-environmental option across the four dimensions examined in this study: pollution, conservation, waste and saving resources. However, the value orientation underlying these choices varied across sub-dimensions. In most cases, children's

verbal explanations were predominantly anthropocentric, even when their choices were environmentally favourable. More clearly ecocentric explanations appeared mainly in relation to animals and, to a lesser extent, in the water pollution sub-dimension.

Pollution dimension

The pollution dimension comprised three sub-dimensions: air pollution, water pollution and noise pollution.

As shown in Table 1, most children selected the more environmentally supportive option in all three sub-dimensions. However, the reasons behind these choices varied. Explanations in the air pollution and noise pollution sub-dimensions were predominantly anthropocentric, whereas the water pollution sub-dimension showed a markedly stronger ecocentric pattern.

As shown in Table 1, the results for the pollution dimension indicate that most children rejected burning the forest ($n = 55$), rejected throwing rubbish into the sea ($n = 57$) and rejected using a device at a high volume ($n = 56$). However, their explanations for these choices were more anthropocentric in air pollution ($n = 44$) and noise pollution ($n = 55$), while the water pollution item elicited mostly ecocentric explanations ($n = 51$).

Examples of anthropocentric reasoning included:

'I do not burn the forest so that it will be nice; God might be angry if the forest does not look nice.' (Participant A38, 5 years 4 months old, male)

'I use a headset so other individuals will not be able to hear the noise.' (Participant A39, 5 years 4 months old, male)

'Because it would flood it and I could not go outside and play.' (Participant A47, 5 years 11 months old, male)

Examples of ecocentric reasoning included:

'Because the birds can build their nests if the forest does not burn.' (Participant A44, 5 years 9 months old, female)

'Because the water is clean, the fish will not die, and the water stays clear.' (Participant A25, 5 years 1 month old, female)

Conservation dimension

The conservation dimension encompasses animal, plant and soil conservation. As shown in Table 2, children again overwhelmingly selected the more environmentally supportive option. Nevertheless, the orientation of their

TABLE 1: Children's pro-environmental attitudes and reasoning in the pollution dimension.

Sub-dimension	Option	Selection (<i>n</i>)	Ecocentric (<i>n</i>)	Anthropocentric (<i>n</i>)	Do not know (<i>n</i>)
Air pollution	Burn the forest to produce a lot of smoke	2	10	44	3
	Do not burn the forest until the forest looks green	55	-	-	-
Water pollution	Throwing rubbish in the sea causes the seawater to become dirty and sea animals to die	57	51	4	2
	Do not throw rubbish in the sea so that the sea water is clean and the animals in the sea can live	0	-	-	-
Noise pollution	Using a device at a high volume so that it disturbs other people	1	0	55	2
	Use a device at a low volume so it does not disturb other people	56	-	-	-

explanations differed across the three sub-dimensions. The animal conservation item elicited mainly ecocentric reasoning, whereas plant and soil conservation elicited mainly anthropocentric explanations.

As shown in Table 2, the results for the conservation dimension indicate that most children said that they would not kill or harm animals ($n = 56$), chose to water or plant trees or plants ($n = 54$) and said they would not dispose of leftover cooking oil on the ground ($n = 55$). When asked to explain these choices, animal conservation showed predominantly ecocentric reasoning ($n = 49$), while plant conservation ($n = 43$) and soil conservation ($n = 40$) were more anthropocentric.

Examples of anthropocentric reasoning included:

'Because God creates birds; if we do something bad to them, it is a sin, and God will be angry, and we will go to hell.' (Participant A26, 5 years 2 months old, male)

'Because I want to plant a tree so I can make a treehouse; that is fun.' (Participant A6, 5 years 10 months old, male)

'Because I have no money, I plant crops in order to use them later.' (Participant A51, 5 years 4 months old, male)

'So the ground will not look dirty if we pour used oil onto it.' (Participant A1, 5 years 0 months, female)

Examples of ecocentric reasoning included:

'Helpless birds, they do not like it. They will die and will not be able to eat.' (Participant A25, 5 years 1 month old, female)

'Because flowers and trees can grow.' (Participant A19, 5 years 2 months old, female)

'Because it helps protect the environment.' (Participant A24, 5 years 4 months old, female)

Waste dimension

The waste dimension included waste disposal and sorting. As shown in Table 3, nearly all children chose the environmentally supportive option in both sub-dimensions. Nevertheless, their explanations were overwhelmingly anthropocentric.

As shown in Table 3, the results for the waste dimension indicate that most children chose to throw rubbish in the appropriate place ($n = 56$) and to dispose of plastic bottles in

the correct bin ($n = 56$). However, their reasons were mainly anthropocentric in both waste disposal ($n = 45$) and waste sorting ($n = 54$).

Examples of anthropocentric reasoning included:

'Flooding, if there is a flood, I might drown.' (Participant A51, 5 years 4 months old, male)

'Allah sees it when we litter, and He will be angry.' (Participant A54, 5 years 8 months old, male)

'Because the bottle bin is blue, and blue is my favourite colour.' (Participant A3, 5 years 4 months old, male)

'So the dustman will not be angry.' (Participant A33, 5 years 2 months old, male)

'It will be difficult for me if rubbish gets mixed.' (Participant A44, 5 years 9 months old, female)

Examples of ecocentric reasoning included:

'So the Earth stays clean.' (Participant A18, 5 years 10 months old, male)

'Because it helps protect the environment and does not disturb the animals.' (Participant A24, 5 years 4 months old, female)

Saving resources dimension

The saving resources dimension comprised energy saving and paper saving. As shown in Table 4, most children selected the more environmentally supportive option in both sub-dimensions. However, the reasons underlying these choices were again predominantly anthropocentric.

As shown in Table 4, the results for the saving resources dimension indicate that most children reported turning off the lights when leaving the room ($n = 51$) and using both sides of the paper when writing or drawing ($n = 54$). However, their explanations were mainly anthropocentric in both energy saving ($n = 49$) and paper saving ($n = 53$).

Examples of anthropocentric reasoning included:

'The room will be dark, the thief will know there is no one there, then the thief will enter the room.' (Participant A51, 5 years 4 months old, male)

'One side will not be enough for my drawing.' (Participant A54, 5 years 8 months old, male)

TABLE 2: Children's pro-environmental attitudes and reasoning in the conservation dimension.

Sub-dimension	Option	Selection (<i>n</i>)	Ecocentric (<i>n</i>)	Anthropocentric (<i>n</i>)	Do not know (<i>n</i>)
Animal Conservation	Killing or harming animals	1	49	5	3
	Do not kill or harm animals	56	-	-	-
Plant conservation	Cutting down trees	3	11	43	3
	Watering and planting plants	54	-	-	-
Soil conservation	Throwing leftover cooking oil on the ground can cause the flowers to wilt.	2	15	40	2
	Do not throw away leftover cooking oil on the ground until the flowers grow well.	55	-	-	-

TABLE 3: Children's pro-environmental attitudes and reasoning in the waste dimension.

Sub-dimension	Option	Selection (<i>n</i>)	Ecocentric (<i>n</i>)	Anthropocentric (<i>n</i>)	Do not know (<i>n</i>)
Throw garbage	Littering	1	6	45	6
	Throw garbage in its place	56	-	-	-
Sorting trash	Dispose of plastic bottles in the trash bin labelled 'plastic'.	56	0	54	3
	Throw away plastic bottles in the trash bin labelled 'paper or cans' or 'food waste'.	1	-	-	-

TABLE 4: Children's pro-environmental attitudes and reasoning in the saving resources dimension.

Sub-dimension	Option	Selection (<i>n</i>)	Ecocentric (<i>n</i>)	Anthropocentric (<i>n</i>)	Do not know (<i>n</i>)
Energy saving	Leave the room with the lights still on	6	2	49	6
	Turn off the lights when leaving the room	51	-	-	-
Paper saving	Using only one side of the paper when writing or drawing	3	0	53	4
	Using both sides of the paper when writing or drawing	54	-	-	-

Examples of more ecocentric reasoning included:

'We do not waste electricity. If we use electricity all the time, the Earth will get hurt.' (Participant A35, 5 years 0 months old, male)

'We do not produce too much trash. If we throw away too much trash, the Earth will become dirty.' (Participant A28, 5 years 2 months old, female)

Cross-dimensional pattern

Taken together, the results show a clear overall pattern. Across all four dimensions, children generally selected the more environmentally supportive option, indicating that pro-environmental preferences were already present at the behavioural level. However, the explanations they provided were more often anthropocentric than ecocentric. The main exceptions appeared in sub-dimensions involving animals, especially water pollution and animal conservation, where children more frequently referred to the well-being and survival of living beings.

Discussion

This study examined how Indonesian children aged 5–6 years expressed pro-environmental attitudes across four issues, namely pollution, conservation, waste and saving resources and whether their explanations reflected ecocentric or anthropocentric reasoning. Two main findings emerged. Firstly, most children selected the more environmentally supportive option across all dimensions. Secondly, although these choices were generally pro-environmental, the reasons underlying them were more often anthropocentric than ecocentric.

In other words, the children tended to support environmentally favourable actions, but they usually justified them in terms of human benefit, safety, convenience, comfort or adult approval rather than the intrinsic value of nature. This pattern is consistent with previous studies showing that young children often display positive environmental preferences while relying mainly on anthropocentric reasoning (Liu & Green 2024; Simsar et al. 2021; Straka et al. 2025).

This pattern can also be understood in relation to early childhood cognitive development. At the ages of 5–6, children are still developing the ability to think beyond immediate, concrete consequences. As a result, they are more likely to explain environmental behaviour in terms directly meaningful to them, such as avoiding floods, dirtiness, noise, punishment or inconvenience, rather than in terms of broader ecological principles.

This interpretation aligns with Piaget's view that children in the preoperational stage often reason from immediate,

personally salient consequences (Hugar et al. 2017; Marwaha, Goswami & Vashist 2017). Thus, in early childhood, pro-environmental behaviour may appear before a deeper ecocentric understanding is fully established.

At the same time, the findings revealed important variation across environmental topics. Ecocentric reasoning appeared more strongly in relation to animals, especially in the animal conservation item and in the water pollution item, when the consequences for fish and other sea animals were made explicit. This suggests that children may respond more readily to environmental harm when it affects visible, living beings rather than more abstract entities such as soil, paper or electricity. One possible explanation is anthropomorphic thinking.

Young children often attribute feelings and experiences to animals, which may make animals easier to empathise with than other parts of nature (Mota-Rojas et al. 2021; Reider & LoBue 2024; Sueur, Forin-Wiart & Pelé 2020).

This tendency may also be reinforced by children's books, cartoons and educational media that portray animals as emotionally relatable beings (Ganea et al. 2014; Hooykaas et al. 2022; Snyder & Mares 2021; Tarłowski & Rybska 2021). In this study, children's statements about birds losing nests or animals dying suggest that they were imagining the direct consequences of environmental harm for living creatures.

The findings also indicate that children's environmental reasoning is likely shaped by socialisation. Several children used religious language, such as referring to God's anger, sin or punishment. These responses suggest that environmental behaviour may be introduced to children through moral and religious messages in everyday life. However, such explanations should not be understood as the result of religion alone. Rather, they seem to reflect broader adult mediation through family communication, school norms and social expectations.

Similarly, many responses were framed as rules or practical consequences rather than as ecological explanations. This may indicate that children are often taught what they should do, but not always why those actions matter for the environment itself. Previous studies have likewise shown that family interaction, parental mediation and adults' environmental knowledge play an important role in shaping children's environmental learning (Bucht, Bachner & Spengler 2024; Cano-Ortiz et al. 2025; Ferreira & Midgette 2024; Portus et al. 2024; Schilhab & Esbensen 2025).

Another noteworthy pattern is the presence of 'do not know' responses and a few explanations based on irrelevant features, such as colour preference. These responses suggest that children's environmental reasoning is still emerging and not yet fully stable. This does not mean that children lack environmental awareness altogether. Rather, it shows that their ability to explain environmental choices depends on how well they understand the scenario and how far they can verbalise their thinking. In this sense, the findings support the view that early childhood is an important but still developing period for environmental meaning-making.

Overall, this study shows that Indonesian children in the early childhood phase already express clear pro-environmental preferences, but these preferences are more often justified in human-centred rather than nature-centred terms. Ecocentric reasoning is present, but it becomes clearer when children think about animals and other living beings. These findings reinforce the importance of examining not only whether children make environmentally supportive choices but also how they explain those choices.

Limitations and recommendations

This study has several limitations that should be acknowledged. Firstly, the study involved 57 children aged 5–6 years from four early childhood education centres in Pinrang, South Sulawesi. As the study was conducted in one regional context only, the findings should be interpreted as context specific and should not be taken as statistically representative of all Indonesian children. Secondly, the data were generated through brief picture-based interviews and documented using handwritten field notes. Although this approach was appropriate for young children, it may not have captured the full richness, nuance or spontaneity of children's verbal reasoning. Thirdly, the factors discussed in relation to children's responses, such as cognitive development, religious language, parenting practices, parental environmental knowledge and anthropomorphic thinking, were identified through interpretive analysis of children's explanations rather than measured directly. Accordingly, these factors should be understood as plausible influences rather than as variables that were independently tested in this study.

Despite these limitations, the findings offer several directions for practice and future research. In educational practice, greater attention should be given not only to encouraging environmentally appropriate behaviour, but also to strengthening children's ecocentric reasoning, especially in relation to air and noise pollution, plant and soil protection, waste management and the saving of electricity and paper. Environmental learning materials may also be improved by presenting not only animals but also other natural elements, such as trees, soil, water and energy, in concrete, meaningful and child-friendly ways. Illustrated storybooks, visual media and audio-visual learning resources may be particularly useful for helping children connect everyday actions with broader ecological consequences. For future research, studies

should involve a wider range of geographical settings and social backgrounds, use audio-recorded interviews where possible and examine more directly how parental knowledge, family communication and teacher practices shape children's environmental reasoning.

Conclusion

The study showed that most Indonesian children aged 5–6 years selected environmentally supportive options across the four dimensions examined: pollution, conservation, waste and saving resources. However, when they explained their choices, their responses more often reflected anthropocentric than ecocentric reasoning. This indicates that positive environmental choices in early childhood do not necessarily reflect a nature-centred understanding but are often grounded in personal benefit, convenience, safety or socially mediated expectations.

A different pattern emerged in items involving animals, in which children's explanations more often reflected ecocentric reasoning. This suggests that young children may find it easier to express care for nature when environmental harm is linked to visible and living beings rather than to more abstract natural elements such as soil, paper or electricity. Overall, the study highlights the importance of examining not only the environmental choices children make but also the meanings they attach to them. In this way, the findings contribute to a better understanding of how pro-environmental attitudes begin to develop in early childhood in the Indonesian context.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

CRedit authorship contribution

Sitti H. Mas'ud: Conceptualisation, Data curation, Formal analysis, Funding acquisition, Methodology, Writing-original draft. Fasli Jalal: Data curation, Supervision, Writing-review & editing. Elindra Yetti: Supervision, Validation, Writing-review & editing. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication and take responsibility for the integrity of its findings.

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Data availability

The authors declare that all data that support this research article and findings are available in the article and its references.

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