

## Research articles

# Environmental perceptions of elementary school students in the early years regarding environmental impacts in a rural school in Angelim, PE

Percepções ambientais de estudantes do ensino fundamental anos iniciais diante dos impactos ambientais em uma escola rural de Angelim, PE

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**HOW TO CITE:** MELO, L. N.; FALCÃO, R. E. A.; SILVA, T. R. Environmental perceptions of elementary school students in the early years regarding environmental impacts in a rural school in Angelim, PE. *Revista Ibero-Americana de Estudos em Educação*, Araraquara, v. 20, e19535, 2025. e-ISSN: 1982-5587. DOI: <https://doi.org/10.21723/riaee.v20i00.1953502>

## Abstract

Students' environmental perception is essential for understanding the environment, especially in rural schools, where proximity to nature is constant. In such contexts, daily interactions with the environment significantly shape children's attitudes and behaviors toward nature. Therefore, this research aims to explore students' environmental perception and identify their attitudes toward environmental impacts within a rural context. To achieve this, a mixed-methods approach (qualitative/quantitative) was used with dynamics such as "Hot Potato" and "Emoticons Dynamics" to evaluate children's environmental perceptions and attitudes. The results showed a significant sensitivity of children to environmental impacts, with variations influenced by cultural, social and educational factors. Therefore, the research highlighted the diversity of environmental perceptions among students, emphasizing the importance of educational programs tailored to students' realities to foster ecological awareness and responsibility.

**Keywords:** environmental education; children's perception; ecological awareness; citizen participation.

## Resumo

A percepção ambiental dos estudantes é fundamental para a compreensão do meio ambiente, especialmente em escolas rurais, onde a proximidade com a natureza é constante. Em tais contextos, as interações cotidianas com o meio ambiente moldam significativamente as atitudes e comportamentos das crianças em relação à natureza. Dessa forma, a pesquisa objetiva explorar a percepção ambiental dos alunos e identificar suas atitudes diante dos impactos ambientais em um contexto rural. Para isso, utilizou-se uma abordagem mista (qualitativa/quantitativa) com dinâmicas como "Batata-quente" e "Dinâmica Emoticons" para avaliar as percepções e atitudes ambientais das crianças. Os resultados, por sua vez, mostraram uma sensibilidade significativa das crianças aos impactos ambientais, com variações influenciadas por fatores culturais, sociais e educacionais. Portanto, a pesquisa destacou a diversidade de percepções ambientais entre os alunos, ressaltando a relevância de programas educativos adaptados à realidade dos estudantes para fomentar a consciência e a responsabilidade ecológica.

**Palavras-chave:** educação ambiental; percepção infantil; consciência ecológica; participação cidadã.

## INTRODUCTION

Environmental perception, as described by Marchi (2018) is the process of becoming aware of environmental values and challenges, learning to appreciate and care for the environment in which we live. Hoeffel and Fadini (2007) define this perception as an interaction between an organism and its environment, influenced by both sensation and cognition. The study of environmental perception is fundamental because it allows us to understand the individuals involved from their own realities, comprehending how they view and interact with the space

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**Submitted:** August 05, 2024

**Reviewed:** April 28, 2025

**Approved:** August 03, 2025

**Financial support:** nothing to declare.

**Conflicts of interest:** There are no conflicts of interest.

**Ethics committee approval:** This study complies with the ethical and legal guidelines for research involving human subjects, as established by Resolutions No. 410/2012 and No. 510/2016. The research was submitted for evaluation to the Research Ethics Committee (CEP) and the National Research Ethics Commission (CONEP). The CEP of the University of Pernambuco – Multicampi Garanhuns was the responsible body for this study, granting approval on December 18, 2023, under opinion number 6.587.779 and CAAE 75933723.2.0000.0128.

**Data availability:** The research data are available within the article. Study conducted at Universidade de Pernambuco (UPE), Garanhuns, PE, Brasil.



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around them, as well as identifying what brings them contentment or discontentment. Therefore, environmental perception is an essential stage in environmental education, as it provides valuable insights into the individuals being studied, serving as a basis for future educational activities and for promoting of a deeper environmental awareness.

The environmental perception of elementary school students is a determining factor in their interaction with and understanding of the environment. According to Cidón, Schreiber and Vecchietti (2021), this is because:

[...] Environmental Education contributes to the development of critical and reflective perceptions regarding the relationship between humans and the environment, fostering the construction of values that guide sustainable attitudes from the early years of schooling.. (Cidón, Schreiber; Vecchietti, 2021).

This perception, when stimulated by meaningful educational practices, directly influences how students understand, value, and interact with the natural world around them. In rural schools, this perception becomes even more pronounced due to the constant proximity to nature. Daily life in an environment where natural elements are present allow students to develop an intimate and personal relationship with the environment, observing and feeling the effects of environmental impacts such as soil erosion, water contamination, biodiversity loss, and the consequences of climate change (Alles; Lutz, 2021).

These direct experiences are crucial for developing awareness of the urgency of environmental conservation and fostering a sense of responsibility. Interaction with the natural environment stimulates sensitivity to specific ecological issues, such as the importance of forests, the preservation of water sources, and the protection of local wildlife. Students learn to connect their daily actions, such as waste management and land use, with the impacts generated on the ecosystem (Asano et al., 2021).

However, environmental perception may not be homogeneous among students, varying according to several factors, such as the quality of environmental education provided, family background, personal experiences, and even the geographical and climatic particularities of the region. While some may have a sharp and empathetic understanding of environmental challenges, others may have a more limited or less critical view (Carvalho et al., 2020).

Moreover, it is essential to recognize that environmental perception is also shaped by the cultural and social factors of the rural community. Local traditions, values, and cultural practices significantly influence how young people perceive and value their natural surroundings (Luccas; Bonotto 2017).

In this context, it becomes imperative that environmental education in rural schools be inclusive and adapted to the students' realities, promoting not only the dissemination of environmental knowledge but also encouraging critical thinking, reflection, and active participation in solving both local and global environmental problems (Silveira et al., 2021).

Understanding students' environmental perception is vital for developing teaching methods that are more effective and engaging, fostering a broader sense of ecological awareness and responsibility. By motivating students to become protagonists of positive change within their communities, we contribute to a more sustainable and equitable future. The purpose of this research is to explore the environmental perception of elementary school students in a rural context, identifying their perceptions and attitudes toward the environmental impacts they witness. This aims to improve educational strategies that promote awareness and proactive action in preserving and enhancing the environment in which they live. To this end, the research seeks to answer the following question: "How are the environmental perceptions and attitudes of children in a rural school influenced by their daily interactions with the environment?"

## **CHILDREN'S CONCEPT OF THE ENVIRONMENT AND THEIR ENVIRONMENTAL VALUES AND ATTITUDES**

Children's concept of the environment is intrinsically linked to their understanding and perception of the world around them. This understanding is influenced by interactions, experiences, and values transmitted throughout their development. From an early age,

children begin to construct an initial view of the environment based on daily experiences, acquired information, and relationships they establish with nature and the adults around them (Childfund Brasil, 2023).

This initial concept may vary depending on each child's social, cultural, and family context. Additionally, environmental education plays a fundamental role in shaping this perception, as it introduces concepts about the interrelationship between living beings and the environment, as well as the importance of conserving natural resources.

Children's environmental values and attitudes are shaped by their initial concept of the environment. Values such as respect for nature, responsibility in the use of natural resources, and the notion of sustainability are essential for the development of proactive attitudes toward the environment (Marchi, 2018).

The emotional and affective bonds that children form with nature play a fundamental role in the development of environmental values. The ability to explore nature, interact with animals, observe landscapes, and engage in outdoor experiences contributes to a sense of appreciation and care for the environment.

Adults play a crucial role in transmitting environmental values and attitudes to children. Through example, dialogue, and encouragement of sustainable practices, adults can positively influence the development of these values, promoting conscious and responsible behaviors toward the environment (Saheb; Rodrigues, 2016; Odino; Souza, 2020).

Childhood experiences, such as outdoor play, educational activities about environmental conservation, and contact with biodiversity, play a significant role in shaping environmental values and attitudes. These experiences influence children's relationship with the environment and impact their future perceptions and behaviors.

Children's environmental values and attitudes can also be strengthened through formal education and specific environmental education programs. Schools that incorporate environmental education into their curricula have the potential to significantly contribute to the development of these values, fostering an ecological awareness from an early age (Silva et al., 2021).

Participation in environmental preservation projects, reforestation activities, recycling, and caring for local flora and fauna, for example, offers children practical opportunities to experience and internalize the values of responsibility and environmental preservation.

It's also essential to recognize the importance of appropriate communication and dialogue about environmental issues with children. Explaining the relevance of natural resource conservation, the consequences of certain actions on the environment, and the impact of individual attitudes on the collective in an accessible and contextualized way can contribute to the development of responsible behaviors (Silva et al., 2021).

The influence of media and technology on children's conception of the environment should also not be underestimated. Cartoons, films, books, and educational games can play a significant role in shaping environmental values and can be consciously used to reinforce positive concepts about environmental preservation.

## **SOURCES OF INFORMATION AND INFLUENCE ON ENVIRONMENTAL ISSUES FOR CHILDREN**

The sources of information and influence regarding environmental issues for children are diverse and play a significant role in shaping their perception and understanding of the environment. Among these sources are children's books focused on environmental education, television programs and educational videos, digital games with ecological themes, interdisciplinary school activities, illustrated educational materials, pedagogical projects developed in schools, as well as educational campaigns aimed at young audiences (Faggionato, 2005; Oliveira; Henning, 2023).

It is also important to highlight the family as one of the main sources of influence, serving as the environment where children first come into contact with concepts and practices related to environmental preservation. Parents' attitudes and behaviors toward nature and

resource conservation have a direct impact on the development of children's environmental values and attitudes. Concepts that can be transmitted include respect for nature, a sense of environmental responsibility, and the notion of sustainability. Practices include conscious use of water and energy, waste separation and recycling, responsible consumption, plant cultivation, appreciation of green spaces, and participation in community environmental care actions. By experiencing these practices in their daily family life, children develop a concrete and emotional understanding of the importance of preserving the environment (Silva, 2019; Rocha, 2021).

Schools and educational institutions play a fundamental role in disseminating information about environmental issues. Formal educational programs, specific subjects, and extracurricular activities focused on environmental education enable children to acquire both theoretical and practical knowledge about the environment, encouraging awareness and engagement with sustainability-related issues.

Media, including television, the internet, books, films, and games, is a powerful source of information and influence on environmental issues for children. Cartoons, educational programs, and documentaries can transmit messages about environmental conservation, biodiversity, climate change, and the importance of preservation, contributing to the development of environmental values and attitudes (Silva et al., 2021).

According to the study by Candamio, Corti and Alvarez (2018), another relevant source of information and influence is children's social interactions, including friends, classmates, and other community members. Group activities such as environmental projects, volunteer work, and community events provide opportunities to share experiences, knowledge, and values related to the environment.

Religious institutions can also influence children's environmental awareness. Many religions include teachings and principles that emphasize responsibility and care for nature, contributing to the development of positive environmental values and attitudes (Giotto et al., 2022).

Outdoor activities and direct interaction with nature, according to (Alves, 2022; Alves et al., 2023; Bastos; Bandeira; Costa, 2023) are fundamental sources of information on environmental issues for children. They provide concrete, sensory, and emotional experiences that facilitate the construction of environmental knowledge.

Another relevant source of influence is the development of awareness regarding individual responsibility. By participating in sustainable practices such as recycling, and saving water and energy, children learn the importance of their actions within the environmental context, promoting proactive values and attitudes toward environmental conservation (Fraga et al., 2021).

Environmental professionals and specialists also play a relevant role in disseminating information and shaping children's environmental awareness. Their importance lies in their up-to-date technical and scientific knowledge, which enables them to translate complex concepts into accessible language, while also serving as reliable references in the educational process. Lectures, visits to museums or research institutes, and educational activities led by these specialists allow children to access accurate, contextualized, and well-founded information, contributing to the development of a critical and responsible understanding of environmental issues.

Virtual communities and social media are also emerging sources of information and influence on environmental issues for children. Online platforms that promote environmental awareness, share information about sustainable practices, and encourage engagement in environmentally related activities can be valuable resources for children's environmental education (Chaigar; Nunes, 2023).

## METHODOLOGY

This research was conducted in accordance with Resolutions 410/2012 and 510/2016, which address research ethics under the Brazilian National Health Council, ensuring that the integrity and identity of participants were protected through confidentiality at all stages of the study.

The Research Ethics Committee for Human Subjects (CEP) approved the research project under opinion number 6.587.779 and CAAE 75933723.2.0000.0128.

The research could potentially cause physical discomfort (fatigue). However, this risk was minimized. Whenever participants felt tired, the research was paused for 40 minutes to allow them to rest, drink water, and eat, without any detriment to them. The participants' identities were preserved, meaning their names were not disclosed in this research.

The research used a mixed-methods approach (qualitative/quantitative), with a descriptive and exploratory character, as defined by Gil (2002). It involved an in-depth discussion on environmental issues within an educational institution. This study emphasized the analysis of the interaction between children and the environment, considering the sociocultural and educational factors that influence this dynamic.

The research was conducted in the rural area of Angelim, Pernambuco, Brazil, at a municipal rural school. It took place in a multigrade classroom with students from the 1st to 5th grade of elementary education, aged 6 to 10 years old. Inclusion and exclusion criteria were applied. Inclusion criteria: residing in the municipality and being regularly enrolled in the selected school. Exclusion criteria: having a school attendance rate lower than 25%.

Two dynamics guided by Andrade et al. (2005), Goldberg, Yunes and Freitas (2005), and Ferreira et al. (2023) were conducted. In these activities, special attention was given to the children's perceptions and emotional connections with their surrounding environment. The goal was to discern the triad of relationships between the Child, Nature, and Environmental Impacts. The activities were named "Hot Potato" and the "Emoticons Dynamic."

The Hot Potato activity was implemented to explore various aspects of children's environmental awareness. It sought to uncover not only the knowledge children had about the environment but also what conservation practices they had already incorporated into their daily lives. Furthermore, the dynamic assessed the degree of sustainability present in their routines. A particular focus of the activity was to understand the children's varied perceptions of environmental impacts, providing an overview of how the new generation views and reacts to current ecological issues. In this activity, the children sat in a discussion circle. To the sound of children's music, a small box containing questions about the environment was passed among them. Whenever the music stopped, the child holding the box would draw a question and read it aloud. After reading, each child shared their answer with the group.

The Emoticons Dynamic was based on the discussions proposed by Andrade et al. (2005) and Goldberg, Yunes and Freitas (2005), who emphasize the importance of enriching children's imaginative world with everyday images rooted in poetic meanings. The goal of this dynamic was to analyze the children's emotional relationships with the environment in which they live. Large cards featuring images of children's daily situations, organized in pairs to represent opposing ideas, were used. During the activity, two emoticon signs displaying expressions of happiness/satisfaction and sadness/dissatisfaction were available. Each child was individually invited to participate in the dynamic, where they would randomly receive a card with an image. The child then expressed their emotions by selecting one of the emotion signs.

The data were analyzed using basic percentages and a descriptive analysis of the students' knowledge and ideas, taking into account their historical-cultural process. The analysis followed the theoretical framework of Lüdke and André (2013), which discusses educational research within a qualitative approach, moving through the following phases: the first, open or exploratory; the second, more systematic in data collection; and the third, which consists of the systematic analysis and interpretation of the data and the drafting of the final manuscript.

## DISCUSSION OF RESULTS

The institution selected for the study was the Antônio Bezerra da Silva Municipal School, located in the Peri Peri farm site, as shown in Figure 1. The participating group of students included a total of 11 children from the 1st to 5th grades of elementary school—6 girls and 5 boys.

The initial activity, named "Emoticons," aimed to assess the students' emotional connections with the environment in which they live. For this dynamic, 14 images were used, along with two representative emojis: one expressing happiness and one expressing sadness. These images





**Figure 1.** Antônio Bezerra da Silva Municipal School.  
**Source:** Authors (2024).

illustrated both environmental challenges, such as deforestation, wildfires, pollution, hunting and trafficking of wild animals, drought effects, and soil degradation, as well as moments of joy and learning through contact with nature, as shown in Figure 2.



**Figure 2.** Signs with emojis expressing happiness and sadness (A), accompanied by the image cards (B).  
**Source:** Authors (2024).

The results of the first dynamic revealed a thoughtful and empathetic attitude among the children regarding the environmental challenges of the rural area. Drought, characterized as a severe environmental condition that directly impacts the availability of natural resources, provoked a predominantly sad emotional response; 91% of the children felt sad when observing this scenario. This sadness can be attributed to the children's intuitive understanding of the consequences of drought, such as biodiversity loss and the difficulty of sustaining rural communities. While only 9% expressed happiness, this can be interpreted as an expression of resilience or a hopeful reaction to overcoming these challenges.

In contrast, natural environments and activities such as fruit picking were associated with joy and well-being, reflecting a positive emotional response in 82% of the children. This can be justified by the fact that such activities not only provide sensory pleasure but also reinforce the children's connection to the land and nature, promoting a sense of belonging and contentment. Direct contact with nature, such as climbing trees, is a source of happiness and exploration, which is corroborated by the high percentage of positive responses. This activity stimulates natural curiosity and freedom of movement, both of which are essential elements for a child's healthy development.

Environmental satisfaction, as described by Galli (2014), is an essential component of well-being and happiness, directly influencing environmental quality. This, in turn, is one of several factors that define quality of life, including harmony with the environment, which is measured by indicators such as the quality of natural resources, pollution levels, population density, mobility, infrastructure, and social interactions.

Scattered trash, symbolizing neglect and pollution, generates feelings of sadness, reflecting the children's concern about environmental carelessness. The sight of garbage accumulated on riverbanks, which caused unanimous sadness, highlights the importance of keeping aquatic environments clean for the emotional and physical health of communities.

In the study by Ferreira et al. (2023), children's perception of urban pollution was highlighted by the unanimous feeling of sadness when faced with streets and sidewalks containing excessive garbage (0% happy, 100% sad). This result demonstrated a clear understanding that scattered garbage in urban areas was negative and harmful to the environment. Similarly, the response to the image of a lake with excessive garbage was also unanimously sad (0% happy, 100% sad), reinforcing the children's awareness of the negative impacts of water pollution.

Children have a natural sensitivity and curiosity for the environment, which can be leveraged to foster environmental interest and awareness from an early age. This means that children have the ability to perceive, feel, and engage with the environment, which differs from adults (Carvalho et al., 2020). Children are more open, spontaneous, and creative, with a desire to explore, discover, and learn about the world around them. This sensitivity and curiosity can be used to stimulate their environmental interest and awareness, helping them understand the importance of caring for the environment and protecting the living beings that inhabit it.

The image of a caged parrot, representing the loss of freedom, evoked feelings of sadness and injustice. This is because children often project their own emotions and desires for freedom onto animals. Human interaction with wild animals, such as an armadillo, was viewed ambivalently, depending on the context. Situations of care and respect were perceived positively, while captivity or mistreatment was evaluated negatively, reflecting the children's ability to discern between beneficial and harmful actions.

Children's citizen participation is a way to involve and mobilize them in collective actions to defend and promote environmental rights. These actions can range from small daily habits, such as saving water, separating trash, and planting a tree, to participating in social movements, non-governmental organizations, councils, and other forums of popular participation.

According to Marchi (2018), children's citizen participation is crucial for engagement with environmental issues. Such involvement not only fosters ecological awareness in children, allowing them to understand the importance of preserving the environment and the life within it, but also instills values of respect, responsibility, and solidarity toward nature, recognizing it as a shared resource vital for collective well-being.

Additionally, images of people having fun in the water surrounded by vegetation convey joy and a sense of harmony with nature, which is unanimously perceived by the children as positive. On the other hand, the sight of fire consuming a forest can be frightening and symbolizes the loss of a vital ecosystem, causing a negative emotional reaction in the children. These reactions emphasize children's empathy for the environment.

In the study by Ferreira et al. (2023), similar results were obtained. The children's responses were also positive regarding outdoor activities. The image of children playing soccer in a dirt field generated happiness in the majority (87.5% happy, 12.5% sad), with many citing appreciations for contact with nature and outdoor physical activities. The small percentage of sadness may reflect negative personal experiences or a preference for more urbanized and structured environments. Similarly, the image of a family having a picnic in a park received a unanimous response of happiness (100% happy, 0% sad), reinforcing the importance of green spaces for leisure and social interaction.

The second dynamic, titled "Hot Potato", was designed to foster an interactive dialogue on fundamental topics such as sustainability, waste management, and natural resource conservation. During the activity, the children demonstrated engaged and reflective participation, answering questions with care. For the first question about the desire to

frequently acquire new personal belongings and/or recreational objects, 64% of the children showed little or no desire for new items. This suggests an inclination toward conscious consumption and a value for sustainability, where the maxim “less is more” prevails. This attitude can be interpreted as a possible family or community influence that prioritizes simplicity and ecological responsibility (reducing waste and reusing).

In contrast, in the study by Ferreira et al. (2023), the unanimous happiness upon seeing a new-generation video game (100% happy, 0% sad) highlighted children’s attraction to modern technology and digital entertainment. This contrasted with some of their environmental perceptions, providing a balance between an interest in technology and environmental awareness.

According to Narcizo (2009), there is a need for practical and transformative actions, as he states that achieving the common good requires concrete attitudes, such as changes in personal and community behavior. This perspective emphasizes that it is not enough to recognize problems; it is essential that each individual adopts significant changes in their daily attitudes and habits. The sum of these individual actions is what builds a more conscious community oriented toward collective well-being. Therefore, to effect positive change in society, it is imperative that people commit to actions that reflect a dedication to the environment and to others, thereby contributing to a more sustainable and just future for all.

On the other hand, the 36% who expressed a strong desire for new belongings may be more aligned with a consumerist culture, where the acquisition of goods is often linked to personal satisfaction and social status. This behavior can be motivated by factors such as targeted advertising, peer pressure, and the availability of attractive and affordable products. The researcher Silva (2023) warns of a vicious cycle in contemporary society, marked by an unsustainable pattern of consumption and production. The need to mass-produce to satisfy growing consumption forces society to extract raw materials from nature in an unrestrained manner.

Advertising has a significant impact on children, shaping their behaviors, desires, and consumption habits from a very early age. Children, in their developmental phase, are especially vulnerable to advertising messages, which often promote a materialistic and consumerist lifestyle (Marchi, 2018; Saheb; Rodrigues, 2016; Silva et al., 2021). This constant stimulation toward excessive consumption can have serious consequences, both for children’s development and for the environment.

From the earliest years of life, children are bombarded with advertisements that use vibrant colors, captivating characters, and engaging music to capture their attention. These ads are designed to create an immediate and strong desire for specific products, from toys to food, shoes, and clothing, as can be seen in Figure 3 (Giroto et al., 2022; Souza; Costa; Rezende, 2023). The constant repetition of these advertising messages leads children to internalize the idea that owning these products is essential for their happiness and social acceptance.

Furthermore, the media plays a fundamental role in this dynamic. Television programs, online videos, apps, and games often contain embedded advertisements or are sponsored by brands that aim to attract a child audience. Cartoon characters and digital influencers are used to promote products in a subtle but effective way, creating a positive association between a beloved character and the promoted item, as illustrated in Figure 4 (Santiago; Picanço; Dias, 2024). This intensifies children’s desire for these products, often leading to impulsive and unreflective consumption.

Consequently, this rampant consumption, promoted by advertising, is directly linked to a high environmental cost. To meet the growing demand for new products, natural resources are extracted intensively and often unsustainably. Forests are devastated to obtain wood and clear space for plantations and pastures; rivers are contaminated by chemicals used in industrial production; and animals lose their habitats and lives due to the expansion of human activities. Furthermore, the manufacturing and disposal of products generate air, water, and soil pollution, releasing toxic substances and accumulating solid waste that can take centuries to decompose (Bastos; Bandeira; Costa, 2023).

This high environmental cost can be measured by different indicators. According to the Food and Agriculture Organization of the United Nations (Food and Agriculture Organization of the





**Figure 3.** Children's toy advertisement from *Shopping dos Brinquedos*. It features three different toy sets: a kitchen set, a shopping cart, and a tool set.

**Source:** Shopping dos Brinquedos (2023).



**Figure 4.** Advertisement for children's footwear from the Esposende store, specifically Grendene Kids brand sandals with a theme from Disney's movie "Frozen."

**Source:** Esposende Calçados (2020).

United Nations, 2020), it is estimated that about 10 million hectares of forests are lost annually worldwide, mainly due to agricultural expansion and timber extraction. The production of consumer goods is responsible for approximately 20% of industrial water pollution, affecting ecosystems and human communities (United Nations Environment Programme, 2021).

Additionally, the United Nations Environment Program points out that the world generates over 2 billion tons of solid waste per year, of which at least 33% is not managed in an environmentally safe manner (United Nations Environment Programme, 2018). The global industry is also responsible for about 20% of annual greenhouse gas emissions, contributing to the worsening of climate change (Intergovernmental Panel on Climate Change, 2021).

These data show that the environmental cost of consumption is not limited to local impacts but reaches global dimensions, compromising the health of ecosystems, the availability of natural resources for future generations, and the planet's climate balance.

The culture of disposability, encouraged by advertising that promotes the idea that "new is always better", further aggravates this situation. Products are purchased, used for a short period, and quickly discarded to make way for new releases (Alves et al., 2023; Souza; Costa; Rezende, 2023). This cycle of consumption and disposal not only depletes natural resources but also overloads waste management systems, resulting in crowded landfills and environmental pollution.

Furthermore, unconscious consumption promoted through advertising aimed at children contributes significantly to this irrational extraction of resources. Many of the products marketed to children are unnecessary for human existence but are sought after for personal satisfaction and well-being. Children are led to believe that they need these products to be happy and accepted by their peers, perpetuating a vicious cycle of consumption and disposal that begins in childhood and can extend into adulthood (Saheb; Rodrigues, 2016; Santiago; Picanço; Dias, 2024).

This dynamic not only negatively affects the environment but also perpetuates values that associate happiness and success with the acquisition of material goods. Children grow up believing that their personal worth is directly linked to what they own, rather than who they are or what they do (Marchi, 2018; Silva et al., 2021). This shapes future generations of unsustainable consumers who continue to prioritize excessive consumption over environmental sustainability and social responsibility.

In the analysis of the second question, "Do you think we always need new things, or can we have fun with what we already have?" we found that 55% of the children expressed that they can have fun with the resources and toys they already possess. This may reflect an emerging environmental consciousness and an appreciation for sustainability. This attitude suggests contentment with what is already available, avoiding excess and waste. In the study by Candamio et al. (2018), this attitude may be influenced by an education focused on valuing what is durable over what is disposable, and an understanding that happiness is not necessarily tied to the possession of new objects.

Additionally, 45% of children who feel the need to acquire new items for fun may be more exposed to a consumerist environment that values novelty and the possession of goods as sources of satisfaction. This behavior can be driven by media influence, children's advertising, and the natural desire to explore new things, which are typical characteristics of childhood curiosity. However, according to Cidón, Schreiber and Vecchietti (2021), it is important to consider that this desire for new toys does not exclude the possibility that children can also be taught about the importance of sustainability and responsible consumption.

In the third question, about the choice of a leisure outing—a beach or a waterfall/river with many trees, or a swimming pool—73% of the children expressed a preference for the pool, which can be attributed to several factors. Pools are perceived as fun and safe environments where children can enjoy water activities like swimming and playing with friends and family in a controlled and familiar context.

Furthermore, the proximity of pools to homes and their easier accessibility, which is comparatively greater than for beaches or rivers, can be decisive factors in this preference. The pool, being an environment planned for leisure, offers amenities such as adult supervision and adequate infrastructure, which can reassure parents and, consequently, influence the children's choice (Cidón; Schreiber; Vecchietti, 2021).

However, 27% of the children showed an inclination toward natural environments such as beaches, waterfalls, and rivers. This preference may be motivated by a desire to explore

nature and interact with a more diverse and stimulating environment. Corroborating this research, Marchi (2018) state that natural places provide unique educational opportunities where children can learn about different types of plants and animals, as well as experience the beauty and tranquility of natural landscapes. The preference for these locations may also reflect an appreciation for authenticity and direct experience with the environment, which could be an indicator of a developing environmental awareness.

In the fourth question, about wanting or not wanting to have a colorful bird trapped in a cage, 91% of the children expressed a preference for not keeping a colorful bird in captivity. This significant majority reflects a growing environmental awareness and a respect for the freedom of animals.

In the research by Ferreira et al. (2023), children's sensitivity to animal freedom was evidenced by the majority of sad responses to seeing a colorful bird in a cage (8% happy, 92% sad). This suggests that, from an early age, children develop empathy for animals and perceive captivity as something negative. However, a small percentage of children expressed happiness, which may be interpreted as a lack of understanding of the negative impacts of captivity or a romanticized view of owning exotic animals.

According to Oliveira and Henning (2023), this attitude may be influenced by an understanding that birds, as living beings, have the right to live in their natural habitat, flying freely and interacting with other animals. This may also indicate a sensitivity to animal welfare issues and a rejection of the idea of confinement.

However, the 9% of children who still expressed a desire to have a colorful bird in a cage may be attracted by the birds' vibrant colors and the pleasure of observing them up close. This preference could also be a reflection of exposure to cultural or family practices where keeping birds in cages is common. It is essential that environmental education addresses the importance of animal welfare and promotes ethical alternatives, such as observing birds in their natural habitats or in sanctuaries that respect their freedom and provide appropriate living conditions (Chaigar; Nunes, 2023).

In the fifth question, regarding the understanding of the waste separation process, we observed that 73% of the children possess knowledge about waste separation, which reflects a remarkable environmental awareness. This understanding may be the result of a series of positive influences, such as family education that prioritizes sustainable practices and exposure to environmental awareness campaigns on the internet, in movies, series, and cartoons. This significant percentage indicates that messages about the importance of recycling and responsible waste management are being effectively assimilated by the new generation.

Cartoons and films have been an integral part of children's lives for generations, playing a fundamental role in shaping their perspectives, ideals, and character. From the beginning of television, these programs have been a significant source of both entertainment and influence on young minds, molding their attitudes, worldviews, and behaviors. Over the years, these programs have evolved considerably, moving from simple entertainment to vehicles that transmit values, morals, and ideologies (Rocha, 2021). Through charismatic characters and engaging narratives, animated shows not only seek to entertain but also to instruct and influence children's behavior (Marchi, 2018)

The narratives in cartoons and films often feature protagonists with whom children can identify, who face challenges and solve problems, often laden with moral values and life lessons. These characters become role models for children, influencing their perceptions of right and wrong and how they should behave in different situations (Alves, 2022).

However, the influence of cartoons and films on the formation of children's character is not unanimous. Controversy arises when considering the different types of content conveyed in these programs. While some cartoons are educational and transmit a positive moral message, others may contain violent elements, stereotypes, or inappropriate behaviors (Camurra; Teruya, 2020).

It is undeniable that cartoons and films play a significant role in the socialization of children, presenting situations that can reflect cultural diversity and teaching values such as respect, cooperation, and conflict resolution (Marchi, 2018). Nevertheless, it is important to recognize

that some cartoons and films may present stereotyped representations that can negatively influence children's perceptions and attitudes (Odinino; Souza, 2020).

Prolonged exposure to certain types of content in cartoons and films can shape how children perceive and react to real-life situations. Behaviors and attitudes modeled by characters can influence how children interact with each other and interpret the world around them (Marchi, 2018)

As for the 27% of children who do not completely understand the process of waste separation, they may not have had the same exposure to this information or might need different educational approaches that reinforce the importance and methods of waste separation.

According to Santos and Silva (2016), classes that incorporate diverse audiovisual resources, such as animations and PowerPoint presentations, along with practical activities like direct observation of nature, visits to ecological parks, and even lectures with cultural specialists, NGO representatives, and the Environmental Police, prove to be extremely effective strategies for disseminating the principles of Environmental Education.

In the sixth question, regarding understanding practices that prevent excessive waste production, 36% of the children demonstrated awareness of practices that contribute to avoiding excessive waste, including recycling, reusing, and reducing consumption. This awareness is a positive indication that messages about sustainability are being absorbed, although there is still room for a deeper understanding of the environmental impact of these practices.

On the other hand, 64% of the children still do not fully understand these practices. This suggests that despite familiarity with waste separation, as indicated by the 73% who knew how to sort waste, the purpose and benefits of recycling and composting are not yet clear to the majority. As Chaigar and Nunes (2023) state, the distinction between knowing how to separate waste and understanding why to do so is fundamental to the development of sustainable habits.

To corroborate this observation, we conducted a practical cut-and-paste activity in which the children had to separate materials for recycling and composting. After the activity, we confirmed that 100% of the students were able to correctly sort the materials into the two categories. This demonstrates that, although they may not fully comprehend the purpose of these actions, the children are capable of correctly performing the task.

## FINAL CONSIDERATIONS

This research highlighted the educational potential of the triad of child, nature, and environmental impacts as an interpretative key to understanding the development of children's environmental perception in rural contexts. The participating children demonstrated a strong sensitivity to the environmental impacts that directly affect their surroundings, such as drought, river pollution, deforestation, and biodiversity loss, reacting with feelings of sadness, worry, and a desire for change. At the same time, they revealed joy and well-being when interacting with nature in a free and playful way—such as when harvesting fruit, climbing trees, or playing outdoors—experiences that reinforce emotional and sensory bonds with the natural environment.

This constant and direct contact with nature, which is typical of rural daily life, fosters the formation of an early ecological awareness based on a concrete experience of the consequences of environmental impacts. The child, as a sensitive and observant individual, perceives environmental transformations both emotionally and rationally, and is capable of associating their own actions, or human actions in general, with either damage or preservation of the environment. Thus, nature presents itself not just as a backdrop, but as a relational space where children process their feelings, understand ecological processes, and build values of care and respect.

At the same time, the results showed that this perception is not homogeneous; it is influenced by factors such as family context, formal environmental education, media, community practices, and local cultural values. Children who experience sustainable practices at home or in the community tend to internalize more conscious attitudes. Others, exposed to excessive



consumption promoted by media and advertising, may develop desires and behaviors less compatible with sustainability.

In this scenario, environmental education plays a central role. Activities developed at school, such as the “Hot Potato” and “Emoticons” dynamics, proved effective in awakening emotional expression, critical reflection, and the appropriation of environmental concepts by children. Integrating pedagogical practices that value local knowledge, feelings, and active student involvement is essential to fully strengthen this triad in its entirety.

Therefore, the need for public policies and pedagogical projects that consolidate the bond between children and nature is reaffirmed, promoting meaningful experiences that allow them to understand, in a lived and critical way, the environmental impacts surrounding them. By recognizing children as individuals capable of perceiving, feeling, and acting on environmental issues, we take an important step toward building a more just, sustainable, and emotionally committed society that is dedicated to the preservation of life.

## ACKNOWLEDGMENTS

We express our sincere gratitude to all the children whose participation enriched this research, as well as to the teachers of Antônio Bezerra da Silva Municipal School—especially Professors Gislene and Giane—for their invaluable support. Our appreciation also extends to the Secretary of Education of the Municipality of Angelim for their encouragement and collaboration. A special acknowledgment is due to the Graduate Program in Health and Socio-Environmental Development (PPGSDS) at the University of Pernambuco – UPE, Garanhuns Campus, for their continuous and essential support.

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#### Authors contribution

LNM: Field research, Data collection, Analysis and interpretation, Manuscript drafting. REAF: Supervision, Guidance, Revision and evaluation of the manuscript. TRS: Supervision, Guidance, Revision and evaluation of the manuscript.

**Editor:** Prof. Dr. José Luís Bizelli

**Executive Editor:** Prof. Dr. Flavia Maria Uehara