

**CONSERVATION OF THE ENVIRONMENT AND ECOLOGICAL HABITS IN ENVIRONMENTAL AWARENESS AMONG ADOLESCENTS IN THE PERUVIAN JUNGLE**

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**Highlight**

Interplay between environmental awareness, ecological habits, and conservation efforts among adolescents in the Peruvian jungle.

**Abstract**

Environmental education has emerged as a strategy to provide solutions to the climate crisis affecting the world, in order to stimulate the development of environmental awareness and promote ecological habits and environmental conservation. In this context, a research was carried out with the objective of determining the influence of environmental conservation and ecological habits on environmental awareness in a sample of 92 high school students of the Alipio Ponce Educational Institution in the Tambopata region - Madre de Dios. The study adopted a basic, non-experimental, cross-sectional and causal correlational design. Three questionnaires were applied to assess the variables environmental conservation, ecological habits and environmental awareness. For each, three dimensions were assessed. The results showed that the variables ecological habits and environmental conservation influence the development of environmental awareness. It is concluded that students are motivated and willing to address environmental issues, but with regular knowledge, which may have

a negative impact on the development of pro-environmental attitudes. It is recommended to implement pedagogical strategies that articulate theory with practice reflected in daily situations.

### **Keywords**

environmental awareness; pro-environmental behaviors; environmental conservation.

### **Introduction**

The world is going through an alarming environmental crisis, the lack of environmental awareness about the different climatic factors that is acquiring a global dimension generated by human activity, characterized by the indiscriminate overexploitation of natural resources and, as a consequence, climate change, deforestation, loss of biodiversity, concentration of carbon dioxide and water vapor, which generate the greenhouse effect, among others [13].

The environmental problem has awakened the concern of activists promoting strategies that can mitigate the damage that is being caused to the planet. Among them, environmental education aimed at students regardless of their educational level, as a conservation strategy to develop skills that prepare people and communities to undertake conscious and collaborative pro-environmental actions for the benefit of their own existence. Considering that the environment is everything that surrounds human beings - natural, physical and biological - in their permanent interaction and that affects the social and psychological development of the individual [34, 35]. The World Health Organization [27] states that almost 90% of people breathe polluted air, about 7 million humans die each year from exposure to fine particles dispersed in the polluted environment that enter the respiratory and cardiovascular system. But, not only the air is polluted, also soils and seas are polluted with plastics that end up on beaches and oceans forming floating islands of plastics that affect the marine habitat.

In Peru, the ecological habits of the population and their actions do not measure consequences, lead to environmental impact with daily activities, such as littering on the beach, on the ground, not cleaning used spaces, using plastic bags disproportionately, elimination of insects by poisoning with pesticides, use of aerosol deodorants and others contribute to environmental degradation. In the research report [21] pointed out that Lima had a UV-R index (Ultra Violet Radiation) that increased to a maximum of 7, an index considered a high level whose exposure affects health.

Environmental awareness implies, what to do and to know about the consequences of human activity for or against the harmony that should exist with everything around us. For [32], it is urgent to develop environmental awareness in and with students and to protect the environment in which we live. The use of alternative ecological programs should be taught in schools. In this aspect, [15], state that it is necessary to provide students with the opportunity to obtain and improve their knowledge, attitudes, values and experiences to establish environmental balance, which can be developed with positive ecological habits, installation of ecological containers tending to recycle organic waste, care of energy and water resources with study of environmental complications. Therefore, environmental awareness allows students to strengthen and improve cognitive skills through social, cultural, ecological and economic actions because they lead to modify the character and ways of dealing with environmental challenges [7].

Environmental conservation is not only an ethical and theoretical approach, but also an operational management strategy for the entire educational and social process, as well as for the cultural revitalization of the national society as a whole. Relating to the sustainable development of the country, the construction of the new citizen that rationally use biodiversity and adapt to climate change today [25]. For his part [39], refers that environmental maintenance is an interdisciplinary process relevant to the formation of values, development of concepts, skills and priority attitudes for a life in harmony between humans, their culture and their surrounding biophysical environment. In this way, environmentalism is all the education provided to people to promote awareness of the environment in which they develop, how to prevent environmental degradation and how to protect the environment from threats such as pollution. The balance and harmony between people, the surrounding environment and development are necessary and important to become a balanced society, responsible for its actions, tending not to eliminate the elements of nature [38].

On the other hand, ecological habits are those that gradually become concrete actions that seek to promote environmental care to maintain the balance of nature [1] [12] mentions that ecological habits are necessary to create awareness, training and guidance to find changes in human traditions and find alternatives that promote sustainable improvements. Which must be implemented as part of the daily life of people, to ensure a solid form, durability and practice, otherwise it remains only knowledge [9, 30]. Therefore, "ecological intelligence" perfectly helps to apply knowledge about the consequences of human activity to compensate for the damage caused to habitats and to live sustainably [17]. At the same time, ecological understanding is empathetic to indicate the distressing traces, making the decision to restore the planet, complementing the analysis of rational causes, the desire to help and develop the ability to adapt to any natural environment.

Research has shown that implementing ecological programs positively changes environmental conservation attitudes in schoolchildren [8, 3, 19] for their part, reflect that environmental thinking through the necessary implementation of ecological habits increases the conservation of the natural environment in which we live. Likewise, [36], points out that 77.4% of the students who participated in pro-environmental educational programs are at an achieved level, which allows us to understand the importance of considering these activities to promote environmental protection. Meanwhile [6] showed, through his proposal of the agroecological vegetable garden, that it generates ecological habits, in aspects of the social, environmental and geographical environment of the students and facilitates the recognition of small shortcomings for which adequate solutions will be found.

However [33] refers to the uncertainty of adolescents regarding environmental protection. There are gaps in their perception and there is an urgent need to develop science and technology to protect the environment; it is imperative to disseminate ecological habits in the social environment of children, adolescents, indigenous peoples, farmers and neighbors in order to contribute to the welfare of society and preserve the varied biology and culture. The formation of ecological habits should be taught from home, being strengthened in educational centers and society, there is a need to permanently improve and achieve the conviction of the urgency of developing environmental awareness in order to preserve the environment. It is possible to show that children in Peru attack the flora and fauna with behaviors that go unnoticed, such as damage to wild flora and fauna and poor disposal of waste.

Adolescents in the Peruvian jungle perceive a lack of environmental awareness, due to actions such as unconsciously littering, generating an environmental challenge in the institution. Therefore, this study is relevant because it aims to determine the influence of environmental conservation and ecological habits on environmental awareness in high school students. The findings obtained will serve as a basis for teachers, who will be able to rethink their strategies and methodologies to carry out environmentalism in an integral manner, combining theoretical and practical aspects in favor of the environment. Based on the hypothesis that environmental conservation and ecological habits influence environmental awareness.

### **Materials and Methods**

The present research design is basic, non-experimental, cross-sectional and causal correlational [18, 31] which seeks to establish the cause-effect relationship if environmental conservation and ecological habits affect environmental awareness in adolescents in the Peruvian jungle. The quantitative approach is established, which approaches the studies by establishing hypotheses, which are formulated prior to data collection and analysis. Standardized procedures accepted by the scientific community will be taken into consideration in data collection. Therefore, from this approach the object of study will be examined on the basis of statistical methodology.

The study population consisted of 120 adolescents from the Tambopata region - Madre de Dios. The sample consisted of 92 students, selected by simple random sampling. Inclusion criteria included being students in the grades mentioned above and attending on the day the instruments were applied.

The technique used for data collection was the survey, while the instruments used were the Environmental Conservation Variable Questionnaire, the Ecological Habits Variable Questionnaire and the Environmental Conservation and Ecological Habits in Environmental Awareness in Secondary Education. The Environmental Awareness Questionnaire has 30 items and evaluates 3 dimensions: Water Care, Soil Care and Recycling of

Inorganic Matter. Its metric properties were determined through the processes of validity by expert judgment and reliability. In this sense, it was determined that it has adequate levels of content validity (applicable) and reliability ( $\alpha = 0.873$ ). Regarding the Ecological Habits Variable Questionnaire, it has 29 items and evaluates 3 dimensions: Classroom Cleanliness, Recycling of Solid Waste, Protection of Green Areas. Its metric properties were also determined through the processes of expert validity and reliability ( $\alpha = 0.865$ ). Finally, the instrument Conservation of the Environment and Ecological Habits in Environmental Awareness in Secondary Education, composed of 27 items, assesses the dimensions Emotional Regulation, Environmental Perception and Environmental Attitudes. In expert judgment it is considered applicable, with a reliability of  $\alpha = 0.834$ . Its valuation through an ordinal scale.

For data collection, the management team was asked for authorization for the application of the instruments. Subsequently, a session with parents and representatives was coordinated with the teachers in order to inform them about the objectives of the research and to request their consent for their children to participate in the study. Once authorization was obtained, the instruments were applied. The statistical analysis was performed using SPSS version 25, using descriptive statistics, measures of central tendency and standard deviation, represented in tables.

Ethical principles were respected in conducting this research, guaranteeing the confidentiality and anonymity of the participants. Likewise, the commitment to deliver the results to the authorities of the institution, with the intention of contributing to the improvement or strengthening of environmental education.

## Results

According to the data collected by the Environmental Conservation Variable Questionnaire, for the water care dimension, the range of affirmative responses ranged from 10-29 ( $X = 21.35 \pm 3.029$ ). Meanwhile, for soil care, the minimum value was 13 and the maximum was 28 ( $X = 20.47 \pm 3.472$ ). Likewise, for the recycling of reusable materials the values ranged between 8 and 30 ( $X = 21.80 \pm 3.772$ ). On the other hand, students presented, on average, high (62.70%) and very high (16.30%) levels of environmental conservation, with the dimension care of water being the highest weighted with 76.10% and 13.0% in the high and very high categories respectively. On the contrary, 33.70% of the students reflected low levels for the soil care dimension (Table 1).

Table 1. Analysis of descriptive statistics and levels of the dimensions of the environmental conservation variable

	Water care	Soil care	Recycling of reusable material	
Descriptive statistics N=92				
<b>Minimum</b>	10	13	8	
<b>Maximum</b>	29	28	30	
<b>Media</b>	21,35	20,47	21,8	
<b>Deviation</b>	3,029	3,472	3,772	
Levels of dimensions (%)				Average
<b>Very low</b>	1,10	0,00	1,10	0,73
<b>Under</b>	9,80	33,70	17,30	20,26
<b>Regular</b>	0,00	0,00	0,00	0,00
<b>High</b>	76,10	51,10	60,90	62,70
<b>Very high</b>	13,00	15,20	20,70	16,30

Regarding the dimensions of the variable ecological habits, a mean of 23.59 (Min.:3- Max.:38; SD  $\pm$  6.19) was obtained for the classroom cleanliness dimension. While, for solid waste recycling the arithmetic mean was 21.48 (Min.:2- Max.:33; SD  $\pm$  5.436). Finally, the mean for protection of green areas was 23.20 (Min.:12- Max.:36; SD  $\pm$  4.995). When rating these dimensions, it was found that students, in general, had high and very high levels, with 51.47% and 28.63% respectively (Table 2).

Table 2. Analysis of descriptive statistics and levels of the dimensions of the ecological habits variable

	Classroom cleaning	Solid waste recycling	Protection of green areas	
Descriptive statistics N=92				
<b>Minimum</b>	3	2	12	
<b>Maximum</b>	38	33	36	
<b>Media</b>	23,59	21,48	23,20	
<b>Deviation</b>	6,19	5,436	4,995	
Levels of dimensions				Average
<b>Very low</b>	1,10	1,10	1,10	1,10
<b>Under</b>	0,00	0,00	0,00	0,00
<b>Regular</b>	13,00	31,50	12,00	18,80
<b>High</b>	52,20	42,40	59,80	51,47
<b>Very high</b>	33,70	25,00	27,20	28,63

With regard to the environmental awareness variable, minimum and maximum values were obtained from the dimension review scales; thus, for Attitudes the range was 14-30 ( $X = 21.01 \pm 3.369$ ); Cognitive 0-24 ( $X = 15.6 \pm 3.777$ ) and Affective 9-27 ( $X = 18.35 \pm 3.353$ ). Likewise, students had high levels 49.73%, followed by moderate level with 29.73% correspondingly. However, in the cognitive area, the highest percentage was concentrated in the regular level with 48.90% (Table 3).

Table 3. Analysis of descriptive statistics and levels of the dimensions of the environmental awareness variable

	Attitudes	Cognitive	Affective	
Descriptive statistics N=92				
<b>Minimum</b>	14	0	9	
<b>Maximum</b>	30	24	27	
<b>Media</b>	21,01	15,6	18,35	
<b>Deviation</b>	3,369	3,777	3,353	
Levels of dimensions				Average
<b>Very low</b>	0,00	1,10	0,00	1,10
<b>Under</b>	0,00	4,30	1,10	1,8
<b>Regular</b>	19,60	48,90	20,70	29,73
<b>High</b>	63,00	33,70	52,20	49,73
<b>Very high</b>	17,40	12,00	26,10	18,5

## Discussion

To face the environmental difficulties that planet Earth is facing, it is necessary to develop environmental awareness in all people, from early childhood to adulthood, to strengthen the understanding of natural, ecological, social and environmental values. Having developed environmental awareness leads to being reflective, critical and agents of change in the face of environmental problems, in turn, allows for a respectful interaction with nature and promotes sustainable development.

According to [10], pro-environmental attitudes include aspects of a person's environmental reasoning, ecological beliefs, biophilia, and willingness to adopt ecological habits. Therefore, it can be said that these attitudes directly influence human behavior as they influence the correct use of natural resources, the protection of environmental quality and the pursuit of sustainable development [28]. In this context, the variables environmental conservation and ecological habits were assessed in high school students, the perception on the dimensions explored, showed higher percentage in high level. The results indicate that students presented motivation and willingness to favorably address climate problems and participate in pro-environmental activities. Similar results were reported [2], who determined that students presented favorable environmentalist attitudes, who also received a comprehensive formal education that allowed them to consolidate knowledge about the subject, as well as strategies for its conservation. Likewise [5] estimated that the majority of fourth grade high school students had positive attitudes regarding environmental care. In contrast, in a study conducted [22] in high school students in the city of Puerto Maldonado, Peru, they found an indifferent attitude towards environmental conservation, which showed little interest in contributing to the conservation of natural and environmental resources, as well as promoting their sustainable use and the reduction of environmental pollution. The difference with other studies may be due to the way in which it is taught, i.e., in some educational institutions the theoretical aspects are prioritized, but in other educational centers both theoretical and practical aspects are elucidated as part of environmental education.

However, with regard to the environmental awareness variable, the findings showed, in general, high levels in the dimensions under study. However, regarding the cognitive dimension, it is located at a regular level, suggesting that students presented moderate levels that restrict pro-environmental actions. This is in accordance with [3, 4] who point out that the cognitive dimension refers to the information and specific-general knowledge that humans have about environmental issues and public policies. So that the components of nature, environmental principles, negative effects on the environment and the causes and consequences of environmental crises are recognized and internalized. In order to work towards sustainable development, that is, to make full use of resources and protect nature (environmental awareness).

The aforementioned results are consistent with those reported by [14] who determined moderate levels of the cognitive dimension of environmental awareness in high school students in Madre de Dios, Peru. They were concerned that although the students surveyed had consolidated their environmental competencies, the promotion of environmental education was not being adequately imparted, since it was not promoting the linkage of knowledge with the solution of real, everyday problems. Likewise, [11], found, in fifth grade high school students in Lima, Peru, a partial development of their environmental awareness, i.e., they rarely raised awareness of measures to protect the environment, on the contrary, they showed responsible behaviors to reduce the impact of their actions on the environment.

Research has shown a direct and positive relationship between the variables environmental conservation and ecological habits with respect to environmental awareness, i.e., adequate levels of development of environmental awareness corresponded to appropriate attitudes of environmental conservation, ecological habits and vice versa [16, 20, 37], in a study conducted with elementary school students, from a public institution, Los Olivos, Peru, to whom he applied an initial questionnaire to assess environmental awareness, showing 52% of low level, subsequently implemented some educational strategies to promote environmental awareness, and reevaluated the students, which, 60% reflected a high level and 40% in medium level. Evidencing the influence of the awareness program. Likewise, [23] affirmed that it is necessary to have adequate levels of environmental awareness, so that ecological habits and conservationist attitudes can be adopted. Indicated the importance of conducting research focused on practical activities that stimulate the development of environmental awareness [29].

In Peru, the national basic education curriculum incorporates the environmental approach in a cross-cutting manner in all curricular areas, mainly with the intention of developing four thematic components: climate change education, eco-efficiency education, health education and education on risks and disasters [24]. The purpose of which is for students to increase their competencies and capacities that will allow them to act responsibly and committed to environmental care. However, it is necessary to strengthen school environmental management and the participation of the educational community, in an activist manner, in environmental actions. For this, it is required to implement new pedagogical strategies that foster environmental culture [16], promote and preserve the environment through management and planning, incorporating educational actors in environmental programs and projects [20]. Likewise, strengthen the articulation between the State, civil society, the private sector and international cooperation [26]. Despite the relevant data provided by the present study, among the limitations for the execution of the study, the number of the sample, the homogeneity of the sample is pointed out. It is recommended for future research to include a larger number of students, as well as to consider other educational institutions, both public and private, in rural and urban areas.

### **Conclusion**

In conclusion, based on the results found, it can be inferred that there is a relationship between environmental awareness and environmental conservation attitudes, also with ecological habits, in the students of 4<sup>to</sup> and 5<sup>to</sup> of secondary school of the Alipio Ponce Educational Institution of the Tambopata region - Madre de Dios. It was determined that the students, in general, had high levels for the studied dimensions of the mentioned variables. However, it was identified, in the students approached, characteristics of regular levels in the cognitive dimension of environmental awareness, which suggests moderate levels of knowledge that can have a negative impact on the development of pro-environmentalist attitudes. In this context, it is recommended to the institution to promote environmental pedagogical strategies that represent common situations and articulate the theoretical and practical in order to strengthen knowledge and sensitivity to environmental issues, thus

contributing to the welfare of the population, mitigation and adaptation to climate change, and sustainable development of the country.

### Conflict of Interest

The authors report no conflicts of interest.

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