

Percepción ambiental en la comunidad El Pesquero, Moa

Environmental perception at El Pesquero community, Moa city

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Abstract: A diagnosis was conducted regarding the environmental perception of the residents of El Pesquero community in Moa city. The participatory observation method was applied, and a survey was conducted to determine the level of knowledge the community inhabitants have about the existing environmental problems in their surroundings. Percentage calculation was used as statistical procedure. The current state of environmental education in the population of the coastal area of El Pesquero neighborhood in Moa was explored, associated with the knowledge and level of knowledge they possess about these issues and their environmental attitude. It is determined that the population's level of environmental knowledge is very low, which does not facilitate the transformation or mitigation of the problems present in that area.

Key words: ecosystems, coast environments, coast line

Resumen: Se realizó un diagnóstico acerca de la percepción ambiental de los pobladores de la comunidad El Pesquero en Moa. Se aplicó el método de observación participativa y se realizó una encuesta para conocer el nivel de conocimiento de los habitantes de la comunidad sobre los problemas ambientales existentes en su entorno. Como procedimiento estadístico se utilizó el cálculo porcentual. Se exploró el estado actual de la educación ambiental en la población del litoral del reparto el Pesquero en Moa, asociado a los conocimientos y nivel de conocimientos que poseen sobre la problemática y de la actitud ambiental de sus pobladores. Se determina que el nivel de conocimiento

ambiental de la población, es muy bajo, lo que no facilita la transformación o mitigación de los problemas que allí se presentan.

Palabras claves: ecosistemas, entornos coesteros, litoral costero

Introduction

Environmental perception conditions individuals' attitude towards the environment they inhabit and influences the orientation and regulation of their actions towards it (Mateo, Francke & García, 2024). Studying this process and the influence to be exerted is important so they can contribute to an environmental culture with a sustainable focus in their action context (Pérez, 2019). According to Rodríguez, Broitman & Ortiz (2022), risk perception has to do with the subjectivities of those who experience it, in a context of uncertainty.

Environmental education enables permanent changes in the members of a social group. This requires concrete actions focused on each community features (Valenzuela *et al.*, 2023; Tarapues-Quiroz, Zúñiga-Escobar, & Osorio-Marulanda, 2023; Meza-Salcedo, Mesa & Leal-Pérez, 2023). Knowing how community members feel about their environment contributes to consistent and valuable education. Environmental pollution in communities harms their members' health and well-being, causes irreversible damage to ecosystems, and decreases the quality of life of those who inhabit them (Palacios & Moreno, 2021; Cubas & Flores, 2023).

Li *et al.* (2017) Remark that the mining industry can generate serious environmental, social, and economic impacts at a regional scale, such as environmental degradation of land, water, and air; health and safety problems (Li, Stoeckl y King 2019); and significantly affect individuals in neighboring communities (Mansilla-Obando, Guínez-Cabrera & Jeldes-Delgado, 2022; Zbyszewska & Maximo, 2025).

Community environmental education in coastal areas is a necessary and urgent process that requires the contribution of its inhabitants through conscious participation in the search for solutions to their environmental problems (Castellanos González *et al.*, 2021).

Moa's coasts constitute one of the most important marine areas associated with the country's mining development. The coastline and its surroundings host several industrial facilities and mining activities which negatively impact their environmental quality. In addition, the progressive demographic development experienced by the region makes this coastal sector one of the most environmentally degraded in the country (Cervantes, 2016).

Cervantes (2016) reports that the concentration of metals As, Cu, and Pb is the result of anthropogenic activity on the coasts of Moa, where various industrial wastes are discharged, affecting oceanic parameters, primarily pH and water transparency. The main effluents come from Waste Liquor (WL), which enters the bay with a low pH and high temperatures, as well as with a high content of toxic elements.

In the coastal zone of the municipality of Moa, there are environmental problems that affect the physical environment and the socio-economic sphere. Therefore, the quality of life of the urban settlements located in areas near the coastline is environmentally unfavorable due to water, soil, and air pollution. The existence of micro-dumps, the spilling of liquid waste and domestic and industrial wastes, as well as the lack of sewage systems, has resulted in neighborhoods with the presence of vectors, hotbeds for contamination and unsanitary conditions (Gutiérrez *et al.*, 2020).

Aranda *et al.* (2023) analyzed the perception of geological risks on the coasts of Moa, proving the importance of strengthening communication, education, and community participation in risk management, both at the local level and through the media. Furthermore, they highlight the need of implementing adequate prevention and preparedness measures to reduce negative impacts of risk events and to foster resilience in this vulnerable community.

Environmental pollution in El Pesquero district, located in the coastal area of the municipality of Moa, in Holguín province (Ramírez & Columbié, 2016), is evidenced by factors linked to mining-metallurgical activity and unsustainable community practices such as industrial dumping into water bodies by Pedro Sotto Alba and Ernesto Che Guevara mining companies, which spill acidic waste and heavy metals into Moa River, La Veguita, and its tributaries, reducing water pH and affecting water resources quality. These pollutants reach the coastal area of El Pesquero, where oil stains are reported due to the waste deposit in the tailings dam and its subsequent discharge into the sea.

Groundwater is contaminated by sewage and chemical processes infiltrations (García, Aldana & Gamboa, 2018).

Open-pit mining generates suspended particles that pollute the air and settle on soils, while leaching with sulfuric acid contributes to land acidification. This impacts local agriculture and increases vulnerability to coastal flooding.

Untreated effluents from metallurgical plants pollute nearby mangroves, while coastal erosion, such as the one in El Pesquero, is worsened by sediments alteration due to mining. In addition, there is an inadequate management of solid wastes, which consists mainly of pollutants generated by daily and domestic activities, negatively affecting ecosystems due to its unsuitable handling (Magallanes *et al.*, 2021; Molina, Gómez & De La Cruz, 2021). Residents recognize problems such as the impossibility to use contaminated coastal areas, however, self-managed solutions are not implemented, or the actions to mitigate these environmental damages to the surroundings are weak and unsystematic.

Diagnosing the environmental knowledge of El Pesquero residents in Moa will allow for the evaluation and improvement of environmental awareness in the community, which is key to address local challenges such as pollution and waste management. By understanding the residents' knowledge and attitudes regarding environmental issues, effective education and awareness programs can be designed to foster community participation in environmental protection. Furthermore, the results can inform local and regional public policies, ensuring that interventions are relevant and effective in improving environmental conditions and the quality of life in this community. This research will contribute to strengthening environmental knowledge and sustainable development in the area, offering a solid foundation for future conservation and environmental education initiatives. Taking these elements into account, this study proposes to diagnose the environmental knowledge of El Pesquero neighborhood residents, in Moa.

Methodology

Population and Sample

The population for this research consisted of the members of the coastal community El Pesquero, in Moa, totaling 255 people from different age groups. The sample was

selected by strata, randomly, by substrata, totaling 153 people: 46 children aged 7 to 12 and 107 adults. This represents 60% of the total population.

Stratified Sampling: The population was divided into subgroups or strata based on relevant characteristics, and then a sample was selected from each stratum randomly or proportionally to its size into the population. In this case, age groups were taken into account.

A survey was used to collect information and opinions from specific groups through Google Forms online platform.

Statistical Methods

The mathematical statistical analysis indicated the procedures to present, summarize, describe, and compare a set of numerical data collected in the field work. Statistical analysis was performed through platforms and artificial intelligence programs, such as Napkin. It was used to process all information, through percentage calculations.

Educational community's members were integrated into the action-research process, a methodology that involves communities in environmental commitment (Pedraza-Jiménez, 2020), to identify their needs and contribute to decision-making from reflection and action processes.

Diagnosis of the Level of Environmental Knowledge in the El Pesquero Community

As part of the research process, an exploration was carried out for the selected sample in the community, with a survey that covered the necessary contents as a starting point for this process.

The survey consisted of seven parameters in the form of questions:

- What is the environment?
- What is a natural environment?
- In which environment is El Pesquero neighborhood located?
- Do you care for your natural environment?
- What outdoor activities do you suggest for environmental care?
- What activities would you like to carry out?

Analysis of the Diagnostic Results

In the first question about knowledge on the environment, 82% of the respondents stated they did Not know it, only 27 respondents, representing the 18%, indicated they Know It, which does not certify that they have an actual knowledge, as demonstrated in the answers to the following questions.

In a second question, the knowledge they possess about their natural environment was explored and, despite living surrounded by or directly in a natural environment, 85% (130 people) answered they did not know the elements making it up. Most correct answers were provided by primary school children.

When asked if they know their specific environment on the coastal coast line, less than 80% (122 people) know it. This aspect shows the limited action of factors and the low interest of community members in these elements.

In the question about whether they care for the natural environment where they live or not, 60% are among those who do not care for it or almost never care for it, a response consistent with the modes of action evidenced in the place.

When inquiring about the activities related to environmental care they would like to be done the most, allowing them to select from 4 types of activities: aquatic, terrestrial, mixed, and coastal hiking, 53% declared that they like aquatic activities and 35% terrestrial activities, the rest are between the mixed and hiking ones. This evidences that the majority likes coastal or beach activities, although tastes and preferences regarding other activities should not be neglected.

When exploring whether they would like to add another type of activity, 95% responded affirmatively. It is revealed that, although in a previous question they voted for the activities established in the survey, it is valid to recognize that they feel attracted to other activities, some of which have little or nothing to do with environmental care.

In a final question, it was meant to know what type of activities they would like to add, they declared the following:

- Talks
- Free walks

- Cockfights
- Drawing contests

The analysis of the knowledge possessed by the population of the coastal area of El Pesquero neighborhood in Moa city, associated with the environmental problems of their surroundings, is low, which hinders the transformation of the problems existing there. However, the survey applied revealed a group or variety of tastes and preferences of the population that can be taken as a basis to elaborate proposals for environmental care.

It is necessary to implement policies that contribute to strengthening the environmental culture of El Pesquero neighborhood residents, in Moa city, in order to increase the knowledge, they have about their community and the problems afflicting it. This will allow them to increase their sense of belonging and general well-being in the community, while also enhancing responsible decision-making, enabling them to become actors into their surroundings' environmental sustainability.

Conclusions

The theoretical and methodological foundations supporting community environmental education were determined, taking into account the main references on the subject, as well as the concepts and definitions about the main variables related to the environment, environmental education, coastline environments care and conservation, and the environmental problems in the coastal area of El Pesquero in Moa are addressed.

The current state of environmental education in the population of the coastal area of El Pesquero neighborhood in Moa was explored, taking into account the knowledge and level of knowledge they possess about the issues and the environmental attitude of its residents. This research evidenced that the population's level of environmental knowledge is very low, which hinders the transformation or mitigation of the problems existing there. Besides, it revealed a group or variety of tastes and preferences among the population that can be considered as a basis to draft proposals for environmental care.

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