

Environmental Education in Rurality in the City of Bolívar Under the Special Program for Rural Education PEER

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ARTICLE INFO

ABSTRACT

Received: 30 Dec 2024

Revised: 05 Feb 2025

Accepted: 25 Feb 2025

This study examines rural environmental education in Ciudad Bolívar, Bogotá, under the framework of the Special Program for Rural Education (PEER). Using a mixed-methods participatory action research (PAR) approach, the research identifies the socio-environmental challenges faced by rural communities, including ecosystem degradation, lack of environmental curricula in schools, and limited teacher training. The main goal is to develop a comprehensive educational strategy that strengthens environmental awareness and promotes sustainable practices tailored to the local context, aligned with the Climate Action Law (Law 2427 of 2024). Findings highlight that community empowerment, the use of technological tools, and the integration of ancestral knowledge are essential for social transformation towards sustainable development and climate resilience in rural areas.

Keywords: Environmental education; Rurality; Ciudad Bolívar; Community participation; Sustainable development; PEER; Climate change

Introduction

In rural basic education, it is necessary to implement innovation strategies in rural environmental education in order to expand educational coverage. According to the latest DANE report for 2019, rural enrollment was 24.4%, which is equivalent to 2,392,624 children studying in remote rural areas. However, this situation poses a challenge in terms of the protection and conservation of strategic ecosystems. One question that arises is whether increasing education in rural areas will also protect nature and the resources we possess. It should be noted that the Colombian economy is highly dependent on the country's natural resources (Criado, 2022). They also promote the creation of alliances between educational institutions, organizations, companies and local communities. These collaborations allow for the development of specific projects that address local needs and take advantage of the knowledge and skills of various actors (Corona Aguilar & Gutiérrez Barbarrusa, 2018).

Environmental education has taken a very important role in the classroom, due to the problems that are currently experienced, generated by man, taking into account that it is part of a natural space. In this sense, the present work is carried out in Ciudad Bolívar under the focus of rural education, analyzing the environment, due to inequality, where the lack of interest on the part of the state in the educational and social development of the inhabitants of this locality is reflected. Rural environmental education in the town of Ciudad Bolívar is approached from an interdisciplinary approach as a contribution to the construction of a solution to the socio-environmental problems that occur in the locality, problems that are not the product of a single cause, but are the result of a sum of situations. This research seeks to contribute to a participatory solution centered on the community; This type of research focused on learning aims for the inhabitants of the locality themselves to build knowledge in their context, so that it can be applied in their daily lives. It is this type of knowledge that is born from the experience that each one possesses as a human being, and for this reason it is valid knowledge that is acquired "by combining education and reality", that

values teaching and its planning "... but give priority to the possibilities and virtualities of daily life as teaching spaces in rural areas."

These variables and characteristics of the natural environment serve to confirm that its state of conservation of strategic ecosystems is moderate, according to the Ministry of Environment and Territorial Development; however, it cannot be ignored that there are also swaths of deterioration and degradation that threaten their biological integrity. With regard to the urban area, in terms of education coverage, a curriculum for basic secondary education is currently being developed. This plan aims to promote a series of attitudes among young students, such as the willingness to take care of the environment, the appreciation of nature, and respect for life in all its manifestations. In addition, it seeks to promote the equitable and supportive use of natural resources, as well as to instill a deep responsibility in relation to the improvement of the environment that surrounds them.

As educators, this possibility must be presented so that the new generations, from their experience, their rural environment, with their human beings, their plants and animals, their uses and techniques, their creations and transformations, are able to achieve sustainable development and systematize the information of ancestral experiences, to appropriate their comfort zone. to preserve what we have left, in its rural environment, with the firm paradigms in this peasant land but with our heads raised to the horizon of knowledge and the new world, of living quietly with nature. A rural environmental education that promotes education and understands the rural area not only as the place of residence of people and cultivation, but also the consideration of the natural environment in all its richness. The function is not to promote ecological protection through a theory of sustainable balancing acts in general, since it is not intended to go from a "Man and nature are opposed" to "Man immersed in nature", but rather the reorganization of the natural cycles of ecosystems to obtain greater benefits.

The objectives of rural environmental education in the town of Ciudad Bolívar, under the Special Rural Education System (PEER) are to sensitize rural populations of the need to restore strategic ecosystems, such as wetlands, dry hills, protected forests, etc. Promote a better understanding of rural ecosystems, their biodiversity, their functioning and their fragility. Formerly rural populations in environmentally related professions, such as agroecology, natural resource management and rural tourism, to promote the sustainable development of rural areas. Encourage the creation of rural resources and alliances under PEER, such as schools, environmental associations, agricultural producers, and local communities (Zuluaga, 2021). The problems of environmental education in the locality are many and varied, ranging from the absence of a specific curriculum in schools to misinformation on environmental issues. Teachers are often not sufficiently trained to adequately teach the principles of environmental education.

This issue is so important, that the government is implementing the climate change law which is one of the most pressing challenges of our time, not only in the locality but in Colombia, with its unique biodiversity and fragile ecosystems, it is no exception. In this context, the Climate Action Bill (Law 2427 of 2024) makes training on environmental sustainability, risk management and climate change issues mandatory, at multiple levels and clearly adapting it to actors such as in rural areas and companies, for example. It is presented as a crucial initiative aimed at propelling the country towards a sustainable development trajectory, while achieving carbon neutrality by 2050.

This hands-on approach not only raises awareness of the importance of conservation, but also offers concrete solutions to the economic challenges faced by these families. In short, through PEER, Ciudad Bolívar is content with global trends in environmental education, but forges its own path, rooted in the cultural values and particularities of its territory in the face of the preservation and bio-regeneration of resources. As a result, they suffer from high unemployment and cumulative emigration to urban centres, further exacerbating inequality. Disparities between urban and rural areas generate social and political tensions, due to the economic exclusion and marginalization of rural populations.

They may lack the knowledge and skills to deal with these issues effectively (Corporación Autónoma Regional de Cundinamarca - CAR, 2019). These issues point to the need to pay more attention to environmental education and make it a priority in schools. It is important to provide adequate educational resources, train teachers, and educate students under sustainability (Cristancho Montenegro et al., 2020).

For this reason, the methodology of participatory action research was selected, to understand from the endogenous of social processes, to the development of activities that allow creating solutions from their particular realities. Also the importance of selecting a socio-economic mechanism that understands the development plans framed in sustainable development.

Justification

In the town of Ciudad Bolívar, in the upper and rural area, environmental problems due to lack of significant learning, generate contrasts with pollution and degradation of the natural system, such as inefficient waste management, lead to a reduction of green spaces and biodiversity, especially in rural areas. This integration could lead to a generation aware of the challenges that surround them, capable of taking action for a sustainable future, where strategic ecosystems are protected. In our Development Plan, human well-being is observed as a way of interacting with nature, its components and the power of life.

Importance of Environmental Education in Rurality

Usually, rurality has been affected by technical, economic and social problems, leaving aside the environmental sector. That is why, from an academic approach, the research will contribute to the academic field for the realization of multiple discussions around this problem in populations belonging to the Special Program of Rural Education. Taking into account that education is a determining factor in social, economic, political progress and in the overcoming of new ideals; In an ecological field and in favor of the common welfare, it is to be hoped that, with this research, a new value will be promoted based on a new attitude towards peasants with a desire to participate, to dedicate time to know, to understand those ecological principles that surround them and to act accordingly so that they promote the development of the community. Rural environmental education plays a transcendental role, it entails a change in the attitude of the inhabitants by receiving the necessary tools on ecological awareness and showing interest in working on it. Thus, through local development based on sustainability, priority problems can be solved and their own objectives can be achieved, promoting rurality towards a global context and providing them with the necessary tools. Therefore, environmental education is essential to comply with social and environmental commitment and should be considered as a tactical tool within social responsibility. It is also a commitment of educational institutions to seek the analysis and interpretation of problems in the different local spaces in the context of sustainable development and the construction of ethical values that tend to the conservation and preservation of their natural environment.

Objectives and benefits of the PEER program in the locality

The PEER Program responds precisely to these challenges by setting educational and community goals, as well as the climate action law. At the educational level, it emphasizes environmental awareness and aims to strengthen the skills of local actors (peasants, indigenous people, NGOs, foundations), allowing for better performance of educational establishments.

Rurality as an identity, seeks to connect the management of natural resources with ways of life and with the cultural week, seeking the strengthening of ancestral popular knowledge. It is a permanent investigative step of the schools. To achieve institutional exchange so that educational entities become centers of cultural and environmental action in the different areas of the town. Promote a true environmental exchange, aware that only with the support of the sidewalk can the educational and environmental quality in the city of Bogotá be improved.

To raise awareness among the entire school community about the local environmental problems, about the importance it has for themselves, and the processes that can be carried out to help solve, that is, to bring life back to the páramo that supplies us with water. We are sure that any way of generating community participation will not be possible if it is not done with and through the approach and permanent relationship with the environmental problems of the educational environment. The educational model adopted is based on the reality and previous knowledge of the students, in order to develop the knowledge, intelligence and capacity of the students through a fully contextualized and interdisciplinary curriculum. Of course, through action research techniques that will be carried out in open spaces.

We can ask the question in the face of the project's social perspectives of education:

Research question: Do rural communities in Ciudad Bolívar lack access to adequate environmental education, leading to the unsustainable exploitation of natural resources and a decrease in their quality of life?

Objectives

General Objective

- Develop an educational strategy based on the Special Rural Education Program (PEER) to strengthen environmental education in the rural communities of Ciudad Bolívar, ensuring its relevance through the training of local actors, the design of practical workshops, and the integration of participatory methodologies that promote sustainability and adaptation to climate change.

Specific Objectives

- To analyze how these resources influence environmental education and contribute to adaptation to climate change in order to develop a training strategy for actors that enhances the effective use of these resources in the teaching of environmental education.
- Implement hands-on environmental education workshops that actively engage students and community members, facilitating participation and active learning to be in line with the climate action law
- Collect qualitative and quantitative feedback from participants to assess the impact of the workshops on their knowledge and environmental behaviors.

Research hypothesis

If there is more environmental education under the climate action law (Law 2427 of 2024) the area of Ciudad Bolívar is rural, the quality of life and well-being will be improved and the SDG quality education would be fulfilled and the community would adapt to climate change as a strengthening strategy in the Bogotá management plan

Pollution is linked to various respiratory and cardiovascular diseases; Improving air quality can reduce the incidence of these diseases, reducing the burden on the health system and improving the quality of life of local residents.

The locality together with the district entities has taken great steps to improve this condition, in the same way it should be noted that other methods must be found to reduce its pollution levels.

Increasing policies that improve the quality of life would mean a great change for the community in economic and social areas. Referring specifically to having fewer health expenses and finding spaces where healthy recreation prevails

In environmental areas we can highlight the care that is being taken in highly affected areas such as wetlands; An improvement in this aspect would reflect great support to combat air pollution considering that these zones help capture carbon dioxide and produce oxygen.

As alternatives and possible solutions, it has been understood that it is necessary for the population to modify the development of daily and economic activities, tending to avoid acts that alter or generate a high impact on the emission of gases and by achieving a reduction, likewise, a reduction in the effects of climate change is achieved. It is also necessary to achieve an adaptation to the changes already presented within the territory where the community and ecosystems are included and avoid deterioration and instead achieve a transformation.

Mixed methodology with PAR

This project is presented as a collaborative methodology that seeks to integrate various stakeholders in the process of knowledge production focused on environmental education. Through a series of activities and focused on sustainability, addressing a variety of questions that directly affect the participants, especially with the community of Ciudad Bolívar (Zúniga-González et al., 2016)

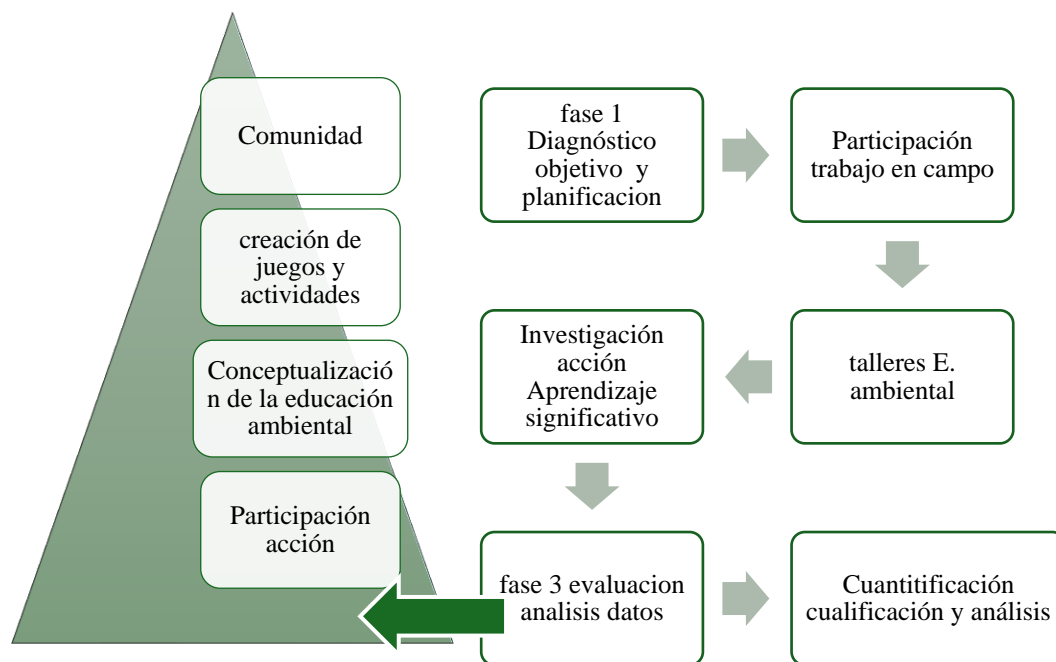
The mixed methods PAR were chosen to facilitate the integration of the community and can be given in the short term as well as in the long term, individual interviews, focus groups, participatory observations, among others will be included (H. José & Peñalver, 2022). Quantitative methods, on the other hand, allow more objective and measurable data to be collected, with questionnaires, surveys or knowledge tests. They allow the evaluation of sustainability and therefore participation in rural environmental education activities (Chavarro et al., 2021). The qualitative method in environmental education in the locality allows us to understand and explore the representations, practices and relationships of individuals with the environment, and to highlight the factors that

influence the commitment to actions of preservation and change, where the community seeks equitable and sustainable development.

For the project, phases were developed described in the following figure 1, The action-participation methodology, by offering a structured and interactive framework, allows communities to be fully involved in their own learning and transformation process. This innovative paradigm aims to empower populations, thereby strengthening their capacities to manage, conserve and protect their environment with a view to sustainability.

Figure 1

Mixed methodology (qualitative and quantitative)



Note: this methodology was adapted from a work with the reintegrated in the areas where the community was empowered through education (Cuartas Giraldo et al., 2023)

Project Phases:

- Diagnostic Phase Objective: To understand the social, economic and environmental context of the town of Ciudad Bolívar and the educational needs related to the environment. Activities: Initial meetings with community leaders and educators to identify local issues.
- Phase 2 fieldwork, interviews and focus meetings, with the leaders of the empowered Colombia Foundation, Application of surveys and interviews with the inhabitants about their perception of the environment and environmental education. Direct observation of Community practices related to the environment
- Phase 3 Evaluation and analysis Data collection (Cuartas Giraldo et al., 2023).

Exploring Participatory Action Research Phase 1

When educational practices are applied in rural areas, a critical attitude towards the form of development imposed by capitalist models on rural areas must be taken into account. In addition, there is no logical sequence in which a step-by-step approach is applied for the development of rural territories, as this will depend on each context and will be easier to solve if rural peasant communities prioritize their problems. To overcome this geographical barrier, teacher training must be taken into account as a fundamental basis, based on environmental pedagogy, developing skills, methodologies and strategies that allow social, economic and cultural development, to promote sustainable rural development. Some of the challenges to be faced when implementing environmental education in rural areas are the easy mobilization of varied and numerous existing natural resources, taking advantage of biodiversity and the environment, generating significant conditions of ecological imbalance and imminent danger in rural areas, resulting in the rural population displaced in urban centers. For this phenomenon, some consequences were created in the

different political framework of each city of origin to improve their living conditions and achieve well-being. On the other hand, today's rural areas are gradually losing their traditional characteristics, becoming areas with greater social mobility, with non-agricultural activities and services located in them, and a population that is beginning to share its values with global society through information and communication systems.

The Role of Key Actors in Rural Environmental Education

The change in environmental education is positive, however, it is not always enough. It is necessary to move from individual appropriation to collective management models, demonstrating that in this way not only do we participate in the performance of ecological functions, but also that the successes and failures in environmental matters are shared, actions complement each other, tasks are associated with others and the risk is borne collectively. In the same way, the development of relationships and interactions between producers is promoted, with all the advantages that this entails. Therefore, in rural education it is very important to lead, empower and train key actors.

A central issue in rural education is relevance. People do not accept teaching if it is not clearly oriented towards their own needs, towards the local problems they face and towards the sustainable development of their own community. The participation of key actors in education is related to local development. Their knowledge of the problems present and the solutions that can be given stimulates greater involvement in decision-making, even more so when such resolutions must be based on improving the standard of living of rural populations. The underlying aim is that both rural and local development should be institutionalized as an active and sustainable process of transformation of the social, economic, political, cultural and spatial reality, with the active participation of rural and local actors, supported by the State and other sectors that provide them with resources and support services according to their capacities and their own dynamism.

Technological Tools and Didactic Resources for Environmental Education in Rural Areas

Children in rural areas are also in contact with technology. They can be in contact with the different sources of information to acquire knowledge about their environment, reality, in the management of specific information in each area, in the work recombining information, in the manipulation of symbols, in the manipulation of different levels of information objects, in the acquisition of habits.

The use of ICTs as resources for the creation and display of "creative" activities and practices has been of great interest to environmental education teachers in non-formal settings. Climate change activities were developed with high school students, which consisted of the use of software to assemble system models. In this same work, a high motivation of students was observed in learning content and software process. Other teachers proposed to prepare presentations with training resources on the solar system or to produce multimedia documentaries in which they incorporated different sources of information on environmental problems. The children also created interactive presentations using the data collected in the visit to a botanical garden or expanded their knowledge of environmental noise by creating databases based on the noise level by urban sectors of the neighboring municipality such as Soacha. With this, we affirm that good teachers are those who provide a sufficient number of positive learning experiences to students. That is intuitively correct, but it is inadequate; learning experiences need to be didactically appropriate and well-planned.

Impact Assessment of Rural Environmental Education Programmes

Different and varied impact assessments have been prepared for different rural environmental education programs, which have been reviewed by the team in accordance with the results to evaluate the impact of these educational proposals. From these impact evaluations it emerges that it is not possible to assign with certainty the changes to the programs themselves, since the methodologies do not report with certainty their representativeness, because many factors coincide in the training, institution and research that occurs in and by the rural school, as educational novelties. While acknowledging that rural environmental education is not an end in itself, but a means to guarantee quality of life, significant efforts have been made since the end of this program with the enormous number of institutional alliances consolidated over several years of its development. For this reason, it is important that rural education has accumulated different rural environmental education programs, educational programs that for different reasons were not consolidated, were surpassed and generated learning that made it possible to clarify the expectations of this program. All the programmatic studies, the needs expressed by leaders, youth, adults and children, and the approach mechanisms defined in partnership aim to promote that this new version of the program

makes a greater contribution to the construction and strengthening of a better quality of sustainable rural life, largely with cognitive justice for rural students. Environmental education in the rural context has come a long way with several programs that preceded this new Special Program for Rural Education, one of many is the Strategy to strengthen processes of reconstruction of the rural social fabric and approach to pedagogical advisors

Socioeconomic and Educational Profile of the City of Ciudad Bolívar

Specialized education is a pillar that underpins socioeconomic and political development in Colombia. However, the progress and consolidation of specialized education in rural areas with an environmental focus has been limited, despite the fact that the country has a diversity of rural territories such as forests, jungles, moors, deserts and agricultural and livestock lands, most of them with complex environmental problems and a wide wealth of natural resources. In the case of Ciudad Bolívar, a town located southeast of the city of Bogotá, there is a rural dynamic, where activities related to agriculture, livestock and extractive mining or quarrying predominate, in an antagonistic way with the conservation needs of areas of ecological importance due to their location within the region's water system. Environmental education can be used with special advantages in the rural world, because it enables technical change in a comprehensive way, in combination not only of technique, but also of lifestyles. The change of people's values and attitudes is a maxim of education, since they are the sources from which the motivational conditions that are behind all human action that occurs arise. Hence, we delimit the importance of this approach to describe our proposal in a locality that lacks specialized environmental education.

Education as a fundamental right

Education is related to the economic system, generates knowledge and skills that form, transform and consolidate the various cultural forms, elevates technical-productive knowledge, that is, leads to the development of a region or country. And in Ciudad Bolívar this reality is commonly observed, the data show how agricultural activities are recognized and protagonists compared to the other sectors of the economy. There is a problem in the consolidation of processes of diversification of the rural economy of the capital region, privileging aspects associated purely with the exploitation of natural resources, generating problems in the preservation of areas of environmental interest. Thus, the different problems of ecosystem affectation, mainly due to poor exploitation of the land and ecosystem services, the conservation of this school reservation of Basic and Secondary Education is becoming increasingly relevant.

Recommendations and Good Practices in Environmental Education in Rural Areas

It is of vital importance that when making recommendations for transformative practices in Rural Environmental Education in the Locality of Ciudad Bolívar, in connection with the pedagogical perspective, the aforementioned points are considered with the aim of reorienting, supporting and suggesting certain good practices, in accordance with the pedagogical spaces, both formal and non-formal. Establishing these criteria helps to feed the horizon of expectations, consolidate an educational project coherent with the lived reality and meet the particular and collective needs of the subjects. Returning to the perspective of human development implies humanizing power so that institutions are strengthened and the unity between the value of the person and the value of reality is not lost. In the proposal of Rural Environmental Education, it emphasizes education for sustainable, reproductive and productive environmental management, environmental research through the location, defense and enrichment of local knowledge in favor of sustainable environmental management, promoting environmental education and the methodology of learning-doing and learning-research, to solve daily rural environmental problems. Rural Basic Education and the Research-Action Proposal are processes where a process of consolidation of the field of Rural Environmental Education will be continued with a critical epistemological perspective and the Environmental Report would be assumed in the didactic strategy of the benefited region.

Continuing education in rural areas

With regard to Rural Environmental Education for Adults, it is proposed to strengthen research on its current expressions in terms of the emerging field and the rural environment, and to suggest within the framework of the projects a critical analysis of its trends and future directions, which provide a perspective on Rural Environmental Education per se. from a utopian aspiration linked to Popular Education. An analysis of the subject of Environmental Education on the state is proposed and responds to Environmental Education promoted by environmental

professionals, established in institutions and oriented, therefore, towards the protection and preservation of the environment (Requena Bolívar, 2018).

Variability in levels of engagement in phase 1 and phase 2

It is important to note that participation in research in the locality does not imply that everyone should be involved in all activities simultaneously. Stakeholders can be involved at various levels and phases of the research process, ranging from planning to evaluating results. Participation and co-creation varies in intensity, and should always transcend the simple provision of information or consultations to stakeholders, especially with the communities of Ciudad Bolívar in the rural part (Mercon, 2022).

Methodological formulation phase 3 and phase 4

In the methodological formulation it is focused on the community. This will allow the results of the research, the emergence of practices that are sustainable and relevant, adapting to the realities and challenges faced by each local community (Figueiredo, 2015).

In this sense, Participatory Action Research cannot be reduced to a restrictive set of predefined formulas, techniques or actors. Only an approach that fosters collaboration, experiential learning and active practice can lead to the generation of meaningful knowledge and innovations, at the intersection of the interests of society and the local community. Many introductions represent it through the intersection of three sustainability circles, it is a visualization that has been criticized for perpetuating categories that require a deeper revision (Requena Bolívar, 2018).

Therefore, the methodology is very relevant in reviews to approach Participatory Action Research through the fundamental principles that can contribute to imagining the way in which research is carried out in a co-creative way. Achieving sustainability does not imply renouncing the differences in role between academic researchers and non-academic actors, such as local authorities, entrepreneurs and citizens.

PAR responds to local challenges and lived realities, this being one of its essential principles, as it seeks to provoke action, innovation or concrete changes in relation to the issues addressed. Participatory action research aspires to contribute to social transformations through the generation of hybrid knowledge, which is relevant from both a scientific and social point of view, and which can be applied in a practical way by the actors participating in this process (Requena Bolívar, 2018).

On the other hand, to explore and emphasize the selection of methodology in the research process, it would be understood that the needs of a community. Likewise, if the alternative management of organic waste is used as a solution to combat the depletion of phosphorus in the soil, a rural experiment. The PAR project in the project is not limited only, it can also be translated into recommendations, active workshops, photographic exhibitions, websites, blogs, videos of different formats, local radio broadcasts, among others. However, the PAR approach focuses on the process of participation that allows these multiple forms of significant results to be achieved, generating valuable effects, such as the strengthening of the cognitive capacities of the actors involved in the topic of study of environmental education (Zúniga-González et al., 2016).

Background

In Colombia, through the standardization in Decree 555 of 2021, provisions are issued which have been adopted in this community to address climate change. Under the monitoring of the Mayor's Office of Bogotá, it can be identified that this locality is going through great environmental problems, which affects the quality of life of its inhabitants, as well as the decline of the environment; For this reason, government entities work together in risk management, green infrastructures, sustainable mobility, clean technologies, community and industry awareness, maintenance and monitoring of wetlands, in order to contribute to a resilient community by improving the quality of life of its inhabitants and promoting sustainable development in the inhabitants of the area.

According to Decree 555 of 2021, which was constituted in Colombia and issued by the national government, in order to adopt measures for the National Development Plan (NDP), generating alignment with the sustainable development goals (SDGs). As a result of Decree 555 of 2021, 17 SDGs are integrated that lead to the implementation of measures to take care of the planet, as well as eradicate poverty. For this project, although they are interoperative, SDG 4 should be used as a pillar, as it would be impossible to develop all aspects.

For López, I. G. (2020) the SDGs are a call to take actions aimed at putting limits on poverty, environmental protection, climate change and the establishment of guarantees to generate actions aimed at promoting peace and prosperity in a territory. According to Sachs, J. D., & Vernis, R. V. (2015). Within the SDGs, it is essential to highlight the actions that a country establishes based on zero hunger, health and well-being, education with high quality standards, equal conditions for all genders, enjoying drinking water, easily accessible energy and renewable resources, which reduce pollutants, therefore, allow economic growth in the national territory. in the face of innovation and restructuring strategies in industries, reducing inequalities, allowing communities to have sustainable options, under responsible production and consumption policies, as well as facilitating actions for the conservation of natural resources, improvement of the climate, maritime life, care of terrestrial ecosystems; therefore, to create and build territories of peace, justice and solid institutions, consequently to create alliances that allow us to achieve these objectives (H. José & Peñalver, 2022).

In the City of Bogotá, there is a locality located southwest of the city, known as Ciudad Bolívar locality 19 which has a higher rural component of the capital, which faces great challenges in relation to climate change, due to its large number of population and urbanization. This locality is committed to SDG 4, aligning itself with current regulations and establishing strategies to comply with SDGs 4 and 13 such as the use of sustainable mobility (bicycles), renewable energies in industry, improvement of air quality, increase of green areas, monitoring and surveillance of air quality, improvement of industrial processes, management of final disposal of waste (composting, recycling) and not least community awareness.

According to Romero Hernández, C.P (2022), when proposing a land use plan, a relevant point to take into account climate change since urban sustainability must be guaranteed. In the case of Bogotá, we find a city with a large territory, crucial for the development of the country since it is the capital of Colombia. Therefore, it is essential to ensure that urban expansion is proportional and careful with the ecosystems that still inhabit the territory, well-defined limits must be set and respected that do not allow the reduction of these ecosystems, thus preserving the flora and fauna of wetlands, forests, reserves and moors that still exist, this as in the face of climate change, mobility strategies that reduce the impact must be set in the territorial planning plan since mobility in the city represents a high percentage of pollution and therefore of climate change

The Special Rural Education System PEER

The Special System of Rural Education serves the rural population at all levels and training modalities. It consists of leading the process of modernization of rural education and contributing, through other sectoral programs, to the sanitation and promotion of rural communities, promoting a safe rural environment, in peace, with justice and equity, capable of generating sustainable prosperity. It is an ideopolitical option that identifies the countryside with its entire economic, social, political and cultural fabric, as a scenario of life and human development, and not only as geographical-ecological conditions.

The general objective of the Special System of Rural Education is to respond, through rural education of and for the countryside, to the characteristics, needs and challenges of rural communities, with the participation of all educational management and other missionary programs of the Secretariat of Education, Recreation and Sports of the Mayor's Office of Bogotá. On the other hand, PEER stimulates the generation of a productive and profitable rural environment, based on sustainable systems of exploitation of natural resources, and strengthens education based on the cultural elements of the peasant landscape that facilitate immaterial and material production for survival and well-being, through the strengthening of the possibilities of projection in individual and collective praxis.

Origin and foundations of PEER

In consideration, it is necessary to consider that the PEER integrated manifestations of the New School, popular education, the orientations of UNESCO, among others, defending pedagogical theses opposed to the traditional pedagogies coming from the culture of the elite. It is characterized by its high operational nature, becoming one of the most influential educational programs in Latin America and the Caribbean, promoting the construction of community schools. Consequently, it argues that PEER is a specific system of rural education that "conceives integral rural education as the transformative movement of the existing social and economic structures in rural areas and, in turn, as the formation of human beings who build and transform their environment, linked in solidarity to the effort of their own social group".

This first approach to PEER already provides important arguments of legitimacy to develop the present research, given the vast experience, history and pedagogical foundations that support the system, highlighting among them its empirical-experimental approach and a special emphasis on the community area. These factors guide the construction of the problem, the model of work with the community and the mechanisms for the generation of reflections from practice for teachers and rural leaders. After overcoming the phenomenon of illiteracy, rural education was concerned with identifying the different capacities of the rural child with respect to the urban child, based on a rural pedagogy.

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Importance of environmental education in rural contexts

At this point, the need for training for environmental conservation that responds to the particular relationship between the inhabitants, the community and its environment is justified. Similarly, environmental education is located as one of the dimensions of training in rural education that is justified from the worldview of rural working peoples. Consequently, emphasis is placed on the reflective exercise on the reality of rural villages that, in response to the neglected proposals in environmental education in urban areas, see the possibility of reinforcing their local educational project based on programs, projects and activities in favor of the care of their territory.

Environmental education has been established as a system established worldwide and regulated since the political constitution in Colombia, establishing that they belong to the field of education. This impulse has been focused on the missions of the teachers in the area of natural sciences, a place where the requirement to address an evaluation exercise is formally felt and whose content generally relates phenomena and beings of nature and the impact of exchange with the climate, biodiversity as one of the specific problems. However, rural environmental education has been described as an educational setting that differs substantially from its counterparts in the city. In other words, educating in rural areas involves a task, communication networks, worldview, interests and cross-border interactions that are different from the urban one, therefore, environmental education in a rural context is different.

The importance of the Climate Law in the current context

Climate change is an unprecedented crisis, determined by the emission of GHGs into the atmosphere after the period of the Industrial Revolution. Climate change education: an agent of change observed in the nineteenth and twentieth centuries, as a result of a marked population increase and industrial development; which led to the intensive use of natural resources and the exhalation of large amounts of carbon dioxide due to the burning of coal. From 1865 to the present day, the amount of GHG in the atmosphere has increased by 20%; having the felling of forests, as well as the generation of electricity, as the main sources of emission into the atmosphere. This situation led scientists in 1846 to raise the suspicion that a high level of CO₂ in the atmosphere would correspond to an increase in global temperature. They drew on their knowledge of physics and looked at the capacity of greenhouse gases; and in the years 1892 and 1897 the first mathematical model was formulated on the improvement of human coexistence and the cessation of fear; based on the evidence of the geological epochs, where it was indicated that 5% of CO₂ was produced by a 27% increase in temperature; estimating that by then man had only made massive combustion of coal by 10%. All the extractive industries of natural resources that are responsible for obtaining energy – such as oil, gas, coal and tar – with the aim of obtaining in a more or less economical way the raw material necessary to generate the energy that moves the world.

Education and the Land Use Plan

The land use plan for the town must contribute to the recovery of spaces contemplating principles such as: land use and zoning, public transport network and infrastructure for active mobility, promotion of social interest housing with a sustainable approach, green spaces (parks, protection of ecosystems – wetlands), flood risk management,

implementation of community culture in the face of active changes for the mitigation of pollutants, preservation of heritage green areas (H. José & Peñalver, 2022).

According to the article by Arias Hernández (2024), assessing territorial resilience from a comprehensive environmental perspective requires considering the interaction between ecosystemic, sociocultural, and political-economic subsystems. A first step is to review whether there are and are implementing land use plans that regulate activities in different areas, taking into account local characteristics and ensuring socio-ecosystem resilience. This comprehensive approach, as seen in the active workshop, makes it possible to ensure that development strategies are sustainable and adaptive in the face of the various environmental stressors.

Figure 2

Result of active work



Note: Current work with vulnerable communities, 2024

Environmental problems in the locality

Among the main environmental problems of the locality, global warming and water pollution generate a high impact on the survival of the population, without providing adequate knowledge and work of what these two problems mean together in our country and the locality, because it is clear that the warmer the air can generate more humidity than cold air. that is to say, the warmer the air would absorb a large amount of water from lakes, plants, oceans and soil, generating drier conditions that could negatively impact the supply of drinking water and agriculture that is developed in our country as one of the main activities of source of income (H. José & Peñalver, 2022). To this end, the local problems of the formulation of the problem are focused

- Destruction of the streams and rivers of the town, such as Quebrada Limas, Tunjo wetland, among others
- Risk effects due to waste, chemical and solid management
- Air quality affected in Pasquilla by mining activities in rural areas.
- La Niña and Niño Phenomena Affecting Mass Removal with Landslides
- Food security, farmers must use more chemicals to produce more, especially in rural areas
- Floods in Caracolí and high-rise neighborhoods of the town

The warming of the locality generates effects on the water and its meteorological phenomena in complex ways, since we can go from precipitation patterns to the reduction of ice sheets, rising sea levels, droughts and floods, in addition to promoting an increase in the impact of violence of these phenomena, causing material and moral damage, victims and displaced throughout the national territory. It is important to point out within this problem that water is a pillar

in climate change, generating a constant role in the atmosphere, since it is through it that the entry and exit of energy is generated, the redistribution of heat and the permanent movement of water from one region to another.

Among the approaches and methodologies of action of environmental education as a pedagogical proposal of a participatory nature aimed at the formation of critical human beings and citizens committed to society, is to address those issues that are related to the local-territorial problem. To this end, what is pertinent and necessary is based on issues of local interest, which allow, fundamentally, to address a comprehensive and contextualized perspective that promotes the dialogue of knowledge; the achievement of concepts, the formulation and taking of a critical position, for the joint construction of new knowledge, the preparation for decision-making and the preparation for environmental action, being pertinent and necessary to carry out work close to the community and the construction of proposals that tend to improve the quality of the local environment, social and natural.

As a result of global and local warming, the climate is constantly changing and can generate positive or negative impacts, especially on the most vulnerable population of the territory and the living beings of our planet, because through the burning of fossil fuels, loss of forests and livestock breeding, an increase in the greenhouse effect and climate change has been generated without an adjustment that allows us to reduce the effects and generate mitigation that implies modifications to daily and economic activities that generate a reduction in greenhouse gases and placate climate change. That is why we must promote safe and positive measures in which all the inhabitants of the territory can contribute and participate in the application of these actions and be able to reduce vulnerability to these threats and even generate regulations by the competent authorities for the regulation of the main sources of pollution and alteration in the atmosphere and increase carbon storage reserves. We are adapting human beings to the effects and changes in the climate without generating the awareness of mitigation or correction that allows us to repair or reduce damage to both the environment and living beings, since by mitigating we make the effects of climate change less serious in addition to avoiding deaths and diseases due to meteorological phenomena generating proper and safe constructions. reforesting forests, generating crop diversity, and restoring the damaged ecosystem (H. José & Peñalver, 2022).

Background Social innovation in rural areas PEER Ciudad Bolívar

In the history of social innovation in environmental projects in education in the rural locality, they are few and often focus on companies and not on the community. The search for intangible benefits that environmental education brings will be a key driver to promote the implementation of socially viable strategies in rural areas. It has been found that small communities with limited resources tend to show a high receptivity to opportunities to protect natural resources, especially when they are convinced that education brings progress (Gutiérrez-Rúa et al., 2019). Examples of this include companies searching the territory for mining resources without prior consultation with the community. Although there are exceptions, these cases seem to support a fairly solid overall trend that is the basis of our project. The pursuit of sustainability is a powerful incentive for changing social innovation processes. The greater the environmental education, the greater the possibility that communities in poverty will be able to break the cycle of poverty, ignorance and malnutrition that affects them, especially in the rural area of the town of Ciudad Bolívar. Therefore, it is essential to frame the project within this perspective. The rural area of Ciudad Bolívar has three areas, from lower and upper Quiba, to the parts of Pasquilla. It has an area of approximately 13,000.3 ha., of which 3,392 hectares are located on urban land, 152.1 ha correspond to urban expansion land, and the remaining 9,608.4 ha are located on rural land (Mayor's Office of Bogotá D.C., 2021).

Environmental pollution in the town is affected by the Doña Juana landfill that since 1988 has affected the rural communities of the town, especially due to odors, arthropods and in rural areas, when they use different pesticides and generate hazardous waste. The consequences are visible and increasing, despite the growing number of initiatives taken by the locality and social actors (Holguín Aguirre et al., 2022). Unfortunately, the efforts seem to be in vain and we realize that the community that seeks the solution is at the same time one of the main culprits, often due to the paradigm of environmental education.

From this PEER, it is evident that there is a lack of environmental awareness that requires our attention in the locality. What should be the approach to continue in the face of social innovation? Just as a child is instructed in basic skills such as walking, reading and writing, it is also essential to guide them to avoid harmful behaviors, while teaching them about the impact of polluting objects from an early age. This need is one of the reasons that prompted the creation of this environmental education project. This aims to be a valuable tool that is implemented in all schools in

the rural area of Ciudad Bolívar, which are few, such as the Colombia Empoderada Foundation in Caracolí that serves people with disabilities and in rural areas. In the rural school of Pasquilla, which serves an average of 150 students in primary and primary care (Palacio et al., 2003).

When we address concepts such as sustainable development or local ecosystems, such as streams and wetlands, a fundamental principle constantly emerges: social responsibility and innovation. This responsibility towards our planet is a burden that we all share, not only the community but everyone, because in this area we have the largest sanitary landfill in Colombia. Each individual has the ability to incorporate innovation into their daily lives in their own way, especially when we have a form of environmental education that protects everyone's resources, such as water and soil, among others (Muñoz-Sánchez et al., 2023).

Educational social innovation is not a passing fad. It is the leaven of the transition to communities adapted to climate change and sustainability. The current socio-economic situation cannot be an excuse for pollution. The promotion of educational social innovations is becoming a social issue of the first order and the PERR establishes the endogenous principles for its development. Therefore, the issue of social innovation will be a long process framed in the SDGs, especially 4 quality education (Guevara et al., 2023).

Social innovation and education for sustainable development are configured, according to the resources used and the objectives pursued, as a driver for social change. Over time, innovation has evolved, and today has an emerging and differentiating potential. Thus, social innovation is currently presented as the use of novel ideas that aim to solve unmet social needs and that enable the parties to achieve sustainable and sustained development. In addition, social innovation is configured as a way of programming and documenting social change, of socializing good practices and inspiring others, and a way of reflecting on social impact. In this sense, a vision of education for sustainable development is offered. It is a defining text built collectively from a conference on environment and development and which, subsequently, has been enriched in a multitude of conferences worldwide. The international community conceived of education for sustainable development as a key component in the growing effort to educate citizens in order to forge a more sustainable future. The task was immense: humanity had committed itself to living sustainably in a world that was, above all, unsustainable.

Key concepts: social innovation, environmental education

The concept of social innovation was born in Europe in the second half of the twentieth century. It is a new concept that differs from others such as technological, scientific and market innovation, a synthesis of the previous three that are successful in the market. Social innovation focuses on changing social relations that it denounces as unjust. It has a subversion component that differentiates it from other kinds of innovations. It is based on germination, participation and learning, cognitive and social, and tends towards reproducibility and authenticity. In addition, social innovation refers to a process of generating new products, services, practices, institutional models and redistribution of the economic, social and cultural spheres to social innovators that respond to the needs of groups and collectives in a historically determined context.

Innovative processes cannot be imposed from the margins of the classroom, the school or the environment, not even in a decentralized way from the top of a hierarchical structure that operates with a fragmentary perspective. They must derive from the members of the educational community themselves, but for this it is necessary to enhance their capacities, providing spaces for cooperative reflection-action, promoting critical dialogue and shared decision-making. It is therefore possible and necessary to educate so that alternative scenarios and spaces of effective participation emerge, where citizen competencies are exercised, which simply means a way of being and being in society that strengthens the human being and his actions in it and in issues of common interest, while promoting the welfare state. In this regard, the Special Plan for Rural Education highlights that environmental education must guide rural students not only in the aesthetic and symbolic construction of their natural and human environment, but also as an agent of change. Rural education decides to take Project Didactics as a pedagogical paradigm and as a transversal axis for the promotion of the population in environmental education.

Context of Ciudad Bolívar and environmental education

According to the Secretary of Social Integration of Bogotá, one in ten inhabitants of Ciudad Bolívar works in waste recycling activities. This becomes the most important economic subsector in the territory, which generates both economic returns when it is exercised as an entrepreneurial activity, and social returns when taking and educating

its participants. Notwithstanding the above, recycling practices in Ciudad Bolívar have a negative impact on the territory, generating the proliferation and mixing of waste materials in different parts of it, producing problems associated with the generation of odors due to decomposition, proliferation of harmful flora and fauna that transmit diseases, and generation of pathogens due to the accumulation of waste generated in the marketing posts. such as fruits, vegetables, plastics and paper as promotional supports, among others.

The Special Plan for Rural Education is a tool that guides rural educational and recreational processes, in order to train the person in life and in the development of their project. It is a strategy for promoting democracy established in the document that regulates the Special Plan for Rural Education. It is an essential element of education and involves processes that are directly or indirectly linked to the education experienced by individuals, communities and educational institutions. It defines and establishes actions to generate the appropriation of the territory, the sense of belonging and rural identity, supported by cultural roots and tradition. In addition, it seeks to identify and enhance the aptitudes, interests and skills of rural actors.

Socioeconomic and environmental characteristics of Ciudad Bolívar

It is very important to previously analyze the current situation of the issue to be worked on in order to achieve a community diagnosis and in this way highlight the different problems that arise there, in order to propose from the following activities an approach that allows an intervention to be carried out to solve the problem to be worked on in the long term and at the same time generate awareness regarding the reduction of environmental impact and the healthy use of the space public.

Another detailed description of the locality dates back to a recent history, at the end of the 80s, in which large areas of land predominated as a spatial reference, scattered throughout the páramo and areas of dry hill and other neighboring moors, inappropriately dedicated to agricultural farms. Few assume themselves to be inhabitants of rural Bogotá with houses imitated from the upper Bogotá called ranchos. The community aspirations identified favoring housing conditions equal to the capital, some longed for healthy food or a quiet life. These aspirations contradict the expectations of the authorities and some of the socioeconomic sectors that are interested in taking advantage of the efforts of developers towards an ecological planning of the territory that finally welcomes migrants from the countryside.

Intersection between social innovation and environmental education in Ciudad Bolívar

Regarding this proposition of the contextual nature of the concept of social innovation, it is clear that not all innovative movements introduce a novelty, even if it remains in the simple act of opposing the instituted order. Innovative actions arising from society require meeting a set of requirements to be considered innovative. First, they must evidence a change from certain previous codes; Secondly, innovation generates controversy and, consequently, the implementation of stabilisation mechanisms on part of the system itself, such as co-optation that neutralises the effects of the change that was seen as beneficial to maintaining the status quo. There is no novelty, there is no innovation. Third, the attempt to increase the quality of the results of innovation. For these reasons, it is important to move towards an approach based on the confluence of different theoretical approaches, as well as to overcome the academic tendency to over-clarification that ends up turning into lethargy and omission of answers. The theoretical and reflective richness must be accompanied by dialogue with all the agents involved and the testing of solutions.

According to the Special Plan for Rural Education, three of the axes of educational policy in rural areas, as is the case of Ciudad Bolívar, are to strengthen and expand rural education in initial education, secondary education and cross-cutting thematic areas, among which the environment stands out. The Directorate of Education for Ciudad Bolívar is one of the sectors directly related to social innovation practices that have an impact on the territory, from a practical point of view, and when it realizes the opportunities for improvement offered by the adoption and more intensive use of Information and Communication Technologies in the educational system.

Potential benefits of social innovation in environmental education

Benefits for the direct recipients of the interventions. Understood as individuals, population groups, organizations, etc., who intend to receive, immediately, the results of the intervention that entails a social innovation. b) Benefits for other groups or people directly unrelated to the innovation processes. That is, indirect results of social innovation. It corresponds to all those who, without participating in the processes of generating an innovation, benefit from its dissemination and implementation. Guarantee the promotion of the sense of belonging to the village or the locality.

To promote the appropriation by the population of common public spaces. Develop strategies that lead to the proper use and administration of natural environments, the object of learning. Motivate for the protection of the environment and for the exploitation and reasonable use of goods and natural resources; to prevent and control environmental problems in the community. Appreciate the potential of the environment and at the same time recognize that problems are generated there. Know the basic elements of environmental problems to prevent and solve from their source. Implement and use action research related to problems, in order to identify, prevent and solve them among all inhabitants. In addition, this PEER for our environment highlights the need for education for situations as critical as those of the displaced population presented above

Actors on the path of environmental education

The territories, not isolated, despite the fact that our decision allows differences in education to depend on a stratum. Interconnections allow resources to be protected, as is the case of Ciudad Bolívar, these are and will be the laboratories of these social innovations. They also contribute to the well-being of strategic ecosystems (Pérez, 2012).

The promotion of social innovations is consolidating itself as a social priority of great relevance in Colombia. In addition, the reality of public finances indicates that there are not always additional resources allocated to equitable redistribution, rather, they become active expenditure that requires efficient management.

This social innovation project contributes to providing new answers to current local problems, to which neither the market nor the authorities can respond on their own. Reducing poverty and exclusion, fighting unemployment, supporting an ageing population, fighting climate change, preserving cultural diversity, curbing the real estate crisis, facilitating access to healthcare, etc. In the face of these numerous challenges, socially innovative initiatives are multiplying, seeking and testing solutions. Social innovation in education requires plural definitions, and it can be said that it facilitates the development of new social needs that, until now, have been little or poorly addressed. Supported by various actors, including the most important one, the community.

Research instruments

To facilitate the taking of observations, field diaries were selected as the main instrument for data collection with criteria on the choice of observation techniques or activity recording, they are those formulated by the mixed methodological design, for this reason field diaries, focus groups and interviews were chosen (Luna-Gijón et al., 2022).

Through rigorous reflection, we will examine the different dimensions of sustainable and their undeniable contribution to research (Cuartas Giraldo et al., 2023). For example, in the process for this project:

- Taking note of these experiences allows me to understand the impact on the research and on the conclusions drawn.
- Evolution of perceptions: as fieldwork progresses, the researcher's perceptions may evolve. Field days can be the starting point of this progression and allow us to trace changes in attitudes or points of view.
- Analysing interactions with participants is at the heart of qualitative research and field diaries have a role in analysis, especially in capturing dialogue with community entities. Not only what participants said can be recorded, but also how they said it, including tone, body language, and other nonverbal cues.

By hosting weekly or monthly meetings, participants can return to discuss real breakthroughs, challenges encountered, and innovative ideas to implement. These meetings create a space for dialogue where everyone is important, also promoting a collaborative dynamic (Escobar & Bonilla Jimenez, 2009).

Meeting Schedule

Tabulating a calendar on Saturdays at the Colombia Empowered Foundation 7:00 am to 12 pm these meetings allow you to maintain a constant participation of the attendees.

Target audience of the empowered Colombia Foundation and leaders

The town of Ciudad Bolívar is one of those with a percentage of rural areas with 74% of the approximate 13000 hectares of extension of its territory, nestled between mountains and the micro-basin of the Tunjuelito River, offers a richer and more fragile natural environment. Natural resources, although abundant, are threatened by

unsustainable human activities, exacerbated by socioeconomic deficits affecting the local population (Hamui-Sutton & Varela-Ruiz, 2013).

Currently, there is an integration of the processes by the institution where they work hard to carry out environmental education workshops through the university and the seedbed, so once the climate action law is formulated, more actors can be summoned with a need to understand environmental processes. It is estimated that at least 40 people will participate in each focus group and workshop, and 10 leaders will participate in each focus group.

Table 1

Target audience data

Description	Datum
Multidimensional poverty 10.9%	10.9 %
Urban population: 650000 inhabitants	650000 inhabitants
Rural 10625 inhabitants	10625 inhabitants
Monetary poverty in the locality	28.1%

Note: *Population projections by locality social integration DANE (2023).*

The history of Ciudad Bolívar, marked by forced displacement and violence, is informed by the current socioeconomic landscapes.

With an alarming rate of 10.9% of multidimensional poverty, it is imperative to explore the causes and consequences of this situation in order to implement specific intervention strategies.

Table 2

Official educational offer by educational level Ciudad Bolívar

Educational level	Offer	Participation
High school	32.842	32,56%
Stocking	12.809	12,70%
Adult Education	4.286	4,25%

Note: SIMAT, Population projections by locality social integration DANE (2023).

This transfer of knowledge and skills is especially valuable for the whole group. It will be documented and with their permission an attendance and control log will be kept (Hamui-Sutton & Varela-Ruiz, 2013).

Discussion methods adapted to mixed methodology

Adapting discussion methods is also crucial to engage all participants. This may include role-playing, small group work, or plenary discussions. These methods make it possible to diversify the ways of speaking and encourage interaction. A facilitator attentive to the heterogeneity of competencies will believe in a positive dynamic, conducive to collective reflection (Osorio González & Castro Ricalde, 2021).

Use of ICT communication technologies

Digital tools

The integration of communication technologies in the discussion groups facilitates exchanges, especially for members who cannot meet physically from the locality, tools such as Protect your Páramo 360 of free access made by the Politécnico Grancolombiano will also be used.

The growing participation on environmental challenges in Ciudad Bolívar is a striking example of how rural areas benefit from education. As part of the Special Rural Education Program (PEER), this project aims to raise awareness among rural communities in the field of all the necessary tools to contribute to sustainability.

PEER initiatives in Ciudad Bolívar under the education project

- Local partnerships: in collaboration with NGOs, foundations and local companies, it strengthens its educational programs and creates synergies for sustainable development.
- Integration of local traditions: by respecting and integrating the traditional knowledge of indigenous populations into educational programs, it promotes cultural and natural heritage through innovation (Ministry of National Education, 2018).

The expected long-term impacts of environmental education in the locality

This creates a circle where awareness leads to action and where action contributes to the preservation of natural resources. Global climate change is an issue that has occupied more and more since recent decades, and has been subject to causing changes in the natural environment. Soils play an essential role in the water, energy and matter cycles, as well as in the regeneration of matter, and play an essential role as a carbon sink and in the regulation of local, regional and global climate. In the face of observed global change, especially at the level of climate change, the soil plays an essential role, since each physical environment depends on the soil with its response to environmental disturbances and it is essential to properly manage these units to maintain the ecological balances that each soil implies. These balances, being vulnerable to changes in the environment, require management and corrective interventions that require specific policies adapted to the different uses and occupations of the land. In the face of global changes, which are estimated to be rapid and intense, continuous monitoring of the environment is needed to provide reliable and detailed information on environmental impacts and trends in the short, medium and long term.

Environmental education as a mechanism in all areas with the climate action law is emerging as an essential need in our modern society, far beyond the simple theoretical discourse. In rural territory in Ciudad Bolívar, they depend directly on their ecosystems, this education is of crucial importance. It is imperative to provide the new generations with an ecological awareness adapted to contemporary problems. The key role of the Special Programme for Rural Education (PEER) in establishing environmental education initiatives in rural areas, focusing on raising awareness of the protection of natural resources and promoting a sustainable economy. development anchored in the local reality (Ministry of National Education, 2018). In this difficult context, PEER stands out as an innovative response, the aim of which is to raise awareness among populations of the need to preserve and improve the environment.

The Basics of the PEER Program in Climate Law

The PEER for the project is based on four essential axes: awareness, participation, training and sustainability. First, the workshops raise awareness of local environmental issues as well as those described by climate law based on environmental sustainability in all aspects (Moreno & Thornton, 2022)

The lack of material resources in rural schools often complicates the implementation of educational activities. Entrenched cultural beliefs can inhibit the acceptance of new environmental ideas. Immediate economic concerns, especially in communities where poverty is prevalent, often take precedence over ecological needs. Therefore, it is crucial to develop integrated approaches, combining environmental education and economic conditions (Ministry of National Education, 2018).

The use of field diaries as a pedagogical tool

In the field diaries of the visits and workshops completed by the project in Ciudad Bolívar, there was a different reception among children, youth and adults around the topics of water, solid waste, deforestation, fruit trees and medicinal plants, due to the field diaries and rallies where practitioners and community members participated. A field diary is, above all, a systematic, systematized and specialized record of observed events that suggests that the person who prepares it has a technique or the craft of recording, the competence to filter the observed from the non-relevant, the creativity to associate events and, therefore, the clarity of his theories and concepts that allow him to interpret actions, agents, entities, movements, transformations, pauses or deteriorations. Specifically, the realization of field diaries in research is of relevant importance in the use of the ethnographic method, since this tool requires specific and detailed observations of the phenomena studied. This study seeks to get readers involved and reflect on their role as peasants depositories of local and traditional knowledge, since belonging to this territory it is essential that they analyze each of the social and environmental aspects that become evident throughout the activities, since their participation and analysis of the information provided will contribute to the general systematization of the

process. A parallel must be made between what is taught in the classroom and the reality that is lived in Ciudad Bolívar. Finally, the participants gave the teacher a survey in which they expressed the aspects to be improved and the activities that they would propose to the new participants. The realization of a field diary is a fundamental aspect in qualitative research, since it allows the researcher to collect information responsibly.

Ciudad Bolívar: environmental and educational context

Ciudad Bolívar has become a recipient of informal settlement processes and successive progressive settlements, which have generated occupation of the peri-steep slope in areas of danger and risk for the population. This excessive growth of the hillside in the last 30 to 40 years has become one of the five biggest problems for the planning and sustainable development of the city. Faced with the growth and use of space on the hillside, the town of Ciudad Bolívar has not been immune to the environmental and social problems generated by the management of the territory. That is why the Mayor's Office has increased efforts in order to intervene in such complex problems. Within the framework of the control and management of the territory, the local administration has created and put into practice a series of regulations and administrative practices that in some cases have been able to generate the perception of authoritarianism or simple formalism, without this having resulted in significant changes in the behavior of citizens with respect to the territory.

The city, aware that the problems of Ciudad Bolívar come in large part from the disarticulation of Ciudad Bolívar with its territory (uncontrolled growth, exploitation without management, citizen unawareness of the importance of the territory for the city), has proposed the Plan for the Regulation, Management and Ordering of High Risk Areas, in order to understand, conserve, guide and promote sustainable development of areas that, due to their topographical and ecological location, have conditions of natural vulnerability and risk. Field diaries in data collection

Design and planning of environmental education visits and workshops

Design of geological and science visits and workshops, basically in the field. From the outset, the difference between the two figures is marked (visits promoted by the teacher-researcher and workshop at the request of the group or center itself, which includes the elaboration of some work modules) as stated in the current documentation, the difference is tacitly marked between one and the other. The first step in the organization of educational excursions is marked by a "". The contents to be discussed in the visits to the geological environment and the geological space are similar, basically focused on the study of landscape forms and their relationship with geological materials, some unique current processes, the relationship between resources and industry. The workshops are aimed at the understanding of certain geological concepts or observation and scientific study of processes. In general, these activities are demanded by the centres and groups that will later complete their implementation with in-depth work in the centre, either during school hours or outside the school. The most extensive include a research phase, a preparation phase at the center and the field day.

Importance of reflection and recording in field diaries

The field diary is an essential instrument for recording what happened in the activities of the visits and workshops, and for reflecting the characteristics and conditions of the researcher's work and interaction context. This type of instrument has traditionally been used in qualitative studies, including environmental education, in which it is possible to persist a certain level of improvisation. It is possible to find that other tools are scarcely mentioned in the record of methods and techniques used, and one of these tools little taken into account is the field diary, which, by the way, is a basic tool in any ethnographic approach.

On the other hand, the development of the record and analysis of the educational process that is carried out through the implementation of the workshops and the visits by the members of the group. "You have to stop and reflect on the experience and, after the emotion of the moment, document this experience. In education, this record of what has been lived, studied and reflected upon is fundamental: it is a passage from lived and peculiar experience to more general experience." Thus, the field diary as a research tool allows the recording of what has been observed, the intervention and self-perception in the natural or artificial environment and the monitoring of social groups, which allows the formulation of clear and concrete questions about the situation treated.

Results

Theoretical foundations of the interview as an educational methodology

Change and innovation are two of the characteristics of the immediate environment of environmental criticism in Ciudad Bolívar, Bogotá. Although nature is lush and abundant, as urbanization and development advances, nature loses ground, ceding this category to concrete and the elements of the built sector. The Bogotá and Tunjuelo rivers, former observers, are today under the weight of the city's buildings and waste. In terms of diagnosis, the heuristic school stands as the natural lung of public inhabitants and a focus of interest for quality of life and environmental impact groups in the towns of Ciudad Bolívar and Usme.

Educating is socializing the techniques to interact with the environment, it is a right of all species. Creating spaces for sectors of the community to know and appropriate their context is a slow and laborious process that shapes the concept of environmental education. The methodologies to carry it out must be adapted to the audience, which is why the interview is chosen in the accompaniment plan, which favors the collection of qualitative information from the leaders of the community. Thus, the work takes the concept of environmental education as a starting point and selects the interview as a way to understand the handling and management of solid waste in the town of Ciudad Bolívar.

Research design: selection of participants and key questions

The sample did not allow at any time to complete the expected number, given the poor accounting of the associations and also the lack of availability of the members who specified that they could not carry out the interview that day. 7 associations from different sectors and 3 teachers from educational institutions in the official and private sectors were interviewed. Teachers Educational Institution - Las Delicias District Educational Institution, 3 teachers of ethics and values. - Institute for Human Development, a private educational institution in the Villa Gloria neighborhood in the Ciudad Bolívar district, 1 teacher who directs the democracy chair. - CIEDI Educational Institution, for the training of teachers in the official sector, 1 co-director of the specialty for tourism. - Gran Yomasa District Business Institution, 1 professor of organizational management. - Rafael Pombo District School, 1 teacher of ethics and gender violence. - San Cristóbal Sur Industrial Technical School, 1 chemistry teacher. - Colegio El Minuto de Dios, a private educational institution in the Villa Gloria neighborhood, 1 teacher in the area of technology. - El Calsín Departmental Educational Institution, 1 Spanish teacher, 1 mathematics teacher.

Ethics and practical considerations in conducting environmental interviews

When the invitation to participate was made to the children, parents and teachers were considered for their consent. The information given to the children and parents was detailed; They were offered the right not to answer questions they did not wish to answer. In the same way, if they did not want the child to be investigated personally, it was not an impediment for them to carry out the proposed activity, since I only took into account their spontaneous participation during the environmental education activities. Another important aspect that is considered from ethics is that the interviewers shared with the interviewees a scenario of trust and understanding, thus achieving their voluntary and genuine participation. This is how in the interviews carried out with children from the different stages of basic education, a pleasant and calm atmosphere was achieved.

The qualitative research process for the case of children in a school context focuses on two methodologies: the interview and documentary observation. This is why these two approaches were involved as part of this research. In this regard, I participated in the children's school activities, giving them the opportunity to meet the interviewer and show naturalness in her presence when they entered the classroom where they were. In two of the schools, other external children were invited by the institution to follow up. Guided observation was used as a form of technical accompaniment in the different environmental education practices and as a basis for the construction of the interview. Students were evaluated, as in the case of interviews with adults.

Impact and benefits of the interview on environmental education in urban contexts

It is highlighted that the interviews carried out (10), as a methodology, provided the knowledge to understand the particular relationship between a group of people and their environment, and for the knowledge that I contribute to the educational processes. Communal exchange, fieldwork, prejudices, knowledge about the environment and productive activities, among the most cited. In the activities, behaviors, culture and identity of people, among the

most cited. And the problems and relationship of the population with the natural environment (relationships with pollution and diseases, among the most cited).

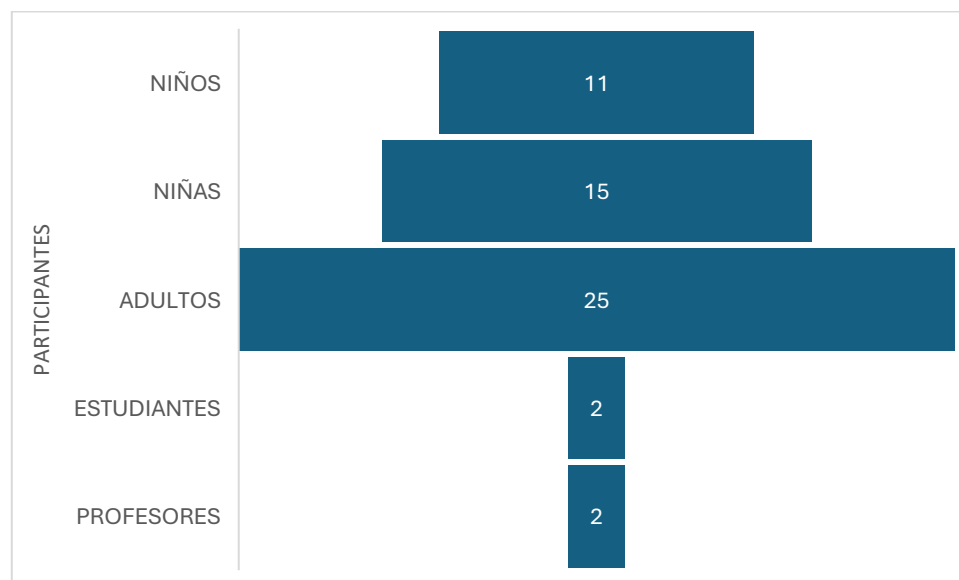
The open interviews allowed for the generation of friendly communication relationships, where the participants talked about important aspects of their lives, not only at the environmental level, where they often showed concern for achieving change by actively participating in the projects or activities we support. They were able to bring their voices to the university, thus giving them a vote of confidence in the development of the project. It was possible to get the participants involved in the process of generating strategies that would improve their relationship with their environments. On many occasions, the interviews opened the doors for a greater rapprochement through the relationship of trust generated. Relationships of trust were achieved not only with the realization of an activity, but also with the opportunity to be part of a joint process to improve the conditions of the communities visited. It was decided to trust in the authenticity of his word and his contribution.

Challenges and limitations in the implementation of interviews in environmental education

Among the main challenges in the results was the complete idea of environmental education in a specific context of rurality. In the three areas analyzed, various environmental education and communication strategies have been developed for several decades, so it is not always easy to orient our discourses towards the unnecessary duplication of programs. In the same sense, designating a new specific space for our program in the territory, within the framework of a field already with busy interlocutors, has been an important challenge. In the town of Ciudad Bolívar we find two other related challenges. On the one hand, the few alternatives of departure time for the population, taking into account that this town is in the south of Bogotá. On the other hand, being drivers, but making use of public transport has represented having our program as a reference; spread easily; not to miss open activities and to occur on a relevant number of occasions. To overcome these challenges, we have worked with various partners, managed staggered departure times to expand coverage, and selected a route to use public transport on several occasions, according to the expected workshop theme, as shown in Figure 3 the average participation in the workshops, in order to reduce the level of uncertainty of our target audience.

Figure 3

Average participation in environmental education workshops



Note: Own elaboration based on research (2025)

All of the above has required a very local analysis that has allowed us to establish important adaptations within the framework of our strategy for each of the localities, with a view to guaranteeing the implementation of our program, especially because of the importance of the experimental and the unforeseen in daily life to make a crucial reality such as the one we are dealing with understandable. Education is related to the economic system, generates knowledge and skills that form, transform and consolidate the various cultural forms, elevates technical-productive knowledge, that is, leads to the development of a region or country.

Analysis of Results

In the exhaustive and detailed analyses of the results obtained so far, a significant and remarkable development has been carried out in this ambitious and long project that focuses especially on the implementation of an innovative and effective educational strategy. This carefully designed strategy is deeply and solidly based on the renowned Special Program for Rural Education (PEER), which has had as its main objective the effective promotion of inclusive and quality education in a wide diversity of rural contexts, which are so different from each other.

The results presented show in a very clear and forceful way the urgent and pressing need to carry out significant and substantial improvements in the capacities, as well as in the competencies of teachers, in relation to sustainable development and imminent climate change. It is absolutely fundamental and essential that educators are trained adequately and effectively, in order to address and deal with these important issues that are so relevant and critical today, since they have a direct impact on the education of future generations and on the care of the planet.

Interviews

In this way, both the effective and efficient use of these resources in teaching were enhanced, also promoting sustainable and responsible practices in various educational contexts, thus favoring a lasting and positive impact on collective environmental awareness. This approach also seeks, through its implementation and continuous development, to strengthen resilience to the multiple climate challenges that we face on a daily basis in society, seeking not only an immediate response to crises, but also a cultural change that ensures a healthier and more sustainable future for future generations and for all the inhabitants of the planet. with a firm and determined commitment to the protection of the environment and the promotion of a balanced development that respects nature and the natural resources that we all share.

Field diaries

An analysis of the field diaries was carried out by applying the qualitative data analysis model, during the time that the internship lasted in the rural sector of the town of Ciudad Bolívar in the village of El Chuscal, the El Dorado peasant house, in the UPZ of Mochuelo, and in the property neighboring the project in the village of El Cerro. First, a general reading of the field diaries was carried out applying the technique of analysis of immersion in the data, immersion in the contexts of information collection, immersion in the impressions and meanings that it gives us every day, the codes being: immersion in the rural context; immersion in the practice of peasant education; immersion in interactions with stakeholders; immersion in school-community interaction; immersion in the tensions or problems associated with the implementation of the PAE in the rural area of Ciudad Bolívar and a special rural education program.

Nonetheless, it is crucial and indispensable that all involved—educators, parents, and students—continue to constantly and proactively seek new and creative robust ways to motivate and engage all students, ensuring that everyone has an equal and fair opportunity to engage and actively participate. It is equally important to provide the necessary and appropriate resources that significantly enrich their learning and educational experience, as well as to create an environment where they are provided with both physical and emotional tools that allow them to fully develop in all aspects of their lives.

Educational strategy

There are the specific actions of the teachers related to the treatment of natural resources, agricultural farms, trips to the natural environment, planning and the government of rural centers. The activities that are allowed in rural centers. That is why a didactic strategy is required that starts from the rural reality of the child, is satisfactory, guiding in the solution of problems, developing attitudes, behaviors and values, based on workshops that promote participation and representation of their own reality. To carry out these behaviors in rural schools, an adequate curriculum is required and these are the legislative references to adapt education to the natural environment.

The educational strategy is the means by which the teacher uses educational methodologies and techniques. The design of the strategy comprises two parts: the educational action itself and the evaluation of the control of the planning of the educational action. The resources that it has provided for the improvement of the quality of education in rural education in the district will be aimed at energizing the operational route of educating, which is committed

to the implementation, improvement and strengthening of the pedagogical and organizational processes of rural educational environments, in its pedagogical, zonal and local duty to do.

Educational Strategy for the Strengthening of Environmental Education in Rural Communities of Ciudad Bolívar

PEER aims to promote an innovative rural education system in various educational and community spaces that is, in turn, sufficiently flexible. This will allow rural diversity to be adequately and effectively addressed, considering all its actors, spaces and significant trajectories that are part of this rich and varied reality.

The purpose of this proposal is to develop a comprehensive educational strategy, which will be based on the Special Program for Rural Education (PEER), with the clear objective of strengthening environmental education in the rural communities of Ciudad Bolívar. Doing so will build resilience to the various effects of climate change that we are facing today. In addition, a collective commitment, a joint effort involving everyone, will be promoted towards the conservation of the environment for present and future generations.

The crucial importance of this type of education for society and the individual lies in the fact that the environmental problems that the planet is currently experiencing cause a series of adverse effects on the health of the human being and on the general well-being of the community.

Feedback from communities

The behaviour of rural inhabitants towards the territory is guided by principles of rationality, functionality and a crucial balance, in such a way that the traditional manifestations of peasant economies are deeply linked to habitat. This reveals the genuine concern of the peasants for the conservation and care of their rivers, mountains and species existing on their properties. This connection between peasant and territory is built from a specific type of rationality that they have developed over the years, which is eminently practical and empirical, manifested in the vast experience they have accumulated over time. This relationship between the farmer and the territory is what in the context of Rural Environmental Education is called interactions of sustainable indiscipline, since this use of resources does not guarantee that negative impacts are being generated on the territory or on the environment in general. The notion of indiscipline refers to the fact that, traditionally, this relationship between the farmer and the territory has been established by the peasants without questioning other alternative modes of use, which could provide new perspectives on the interaction with the environment and allow more sustainable and respectful practices in the future.

What stands out in this context is that there will be as many modes of relationship between the farmer and the territory as there are plotters in the country; That is, this complex interaction moves to the disparity of experiences of individual fields that are undoubtedly different in their landscape location, as well as in their connotations of specific land uses. Thus, and from a very elaborate descriptive analysis, carried out from deep observation, the unraveling of the inherent rationality and a focused dialogue with the grassroots community, the following fundamental results can be reached. Rural Environmental Education, in its essence, contributes significantly to sustainable rural development when it manages to incorporate two features that are particularly present and relevant in rural areas: the crucial importance of local identity and the ancestral knowledge of the region, and the presence of broad layers of the population that are excluded from local development proposals. which often face low levels of civic participation.

Conclusions

Environmental education stands as an essential and fundamental element to ensure sustainable development and the conservation of the ecological balance in a specific territory. During the last several decades, Colombia has been structuring various policies, plans and programs that seek to actively involve the population, thus promoting a positive and sustainable change in the behavior of citizens with respect to their environment, in an assertive, conscious and friendly way.

It is essential to involve all social actors to create an inclusive framework that allows sustainable development and effective mitigation of the adverse effects of climate change. Although environmental education has been present in Colombia for approximately two decades, it is important to note that it was only a couple of years ago that it ceased to be a utopian and distant concept for many of the country's rural inhabitants. In this context, it has begun to take on vivid nuances and clear action on the part of its promoters and defenders. Supported by the Law that promulgates

"Sustainable Development", it is established as a collective purpose in which the State, the community, groups and individuals must coherently orient their productive and social activity towards a future that respects and conserves the environment. In addition, different efforts have been created by the State, facilitating and paving the way to a more hopeful future for rural inhabitants. It is evident that, in this process, it is recognized that ecosystems are finite and that they depend on the interaction, care, and active responsibility of the humans who are part of them. For this work, it is clear that the different state projects not only seek to promote actions, but also pursue much more ambitious goals. These initiatives are designed to call for greater participation of users and the entire community in this important path towards achieving sustainable development in the country, which is essential for the survival and well-being of future generations.

The project has significantly promoted community empowerment, facilitating the conscious and engaged participation of the inhabitants in the identification of various environmental problems and in the search for effective and sustainable solutions. Through various practical and dynamic activities, including the effective and responsible conservation of water resources, as well as proper and organized solid waste management, participants have managed to develop very important and useful skills that allow them to apply valuable and meaningful knowledge in their daily and everyday lives. This, in turn, significantly improves the quality of life in rural areas, and fosters a more sustainable, active community that is aware of its natural environment, as well as the environmental problems and challenges that we currently face and that require urgent attention and concrete actions.

Recommendations

Taking into account the current regulations of environmental education, it is clear that the teachers of the school are not fully applying what is proposed in it. Undoubtedly, this is due to the inadequate training of teachers, most of whom do not have specific training in environmental education. There is no school environmental project, specifically in rural education, which is necessary to structure the activities necessary to implement environmental education. Specific assignments are specially distributed to the classroom teacher, who uses them for the different activities. It is recommended that the specific assignments be reviewed so that there is a space for some environmental education orientation. Although there is an institutional rural education program, it is not evident in the establishment. Finally, and in order to advance a policy of continuous training, it would be important to consider the possibility of having a specific offer to train teachers in environmental education, not only in the specific pedagogical task, but also to sensitize them to the place where educational activities are developed, articulated or coordinated and the development needs of their territories

It is recommended to promote pedagogical strategies that are in accordance with the specific characteristics and particularities of the rural communities that make up the district, with the aim of consolidating alternatives that effectively enable the comprehensive training of the subjects who are part of the educational community at its various educational levels. It is essential not to neglect the diversity of functions, cultures and knowledge that exist in the rural context.

The teacher must structure alternative methods that are in line with the pedagogy oriented to the realities of the rural context, such as the development of basic apprentices on life and work in the fields, as well as the execution of agricultural activities, urbanization, and aspects related to housing and basic services. These are aspects in which we have neglected or ignored basic needs in a dignified and adequate way. By taking advantage of resources, experiences and knowledge that will help improve learning at all levels, a positive impact can be achieved in the formation of more responsible citizens committed to sustainability.

References

- [1] Mayor's Office of Bogotá D.C. (2021). Bogotá Verdece Territorial Planning Plan 2022-2035. Technical Support Document.
- [2] Abreu-Valdivia, O., Pla-López, R., Naranjo-Toro, M., & Rhea-González, S. (2021). Pedagogy as a science: its object of study, categories, laws and principles. *Information Technology*, 32(3), 131–140. <https://doi.org/10.4067/s0718-07642021000300131>
- [3] Ceballos Almeraya, J. M. (2021). Drive: a virtual research space for the development of research and digital competencies in undergraduates. *Panorama*, 15(29), 82–102. <https://doi.org/10.15765/pnrm.v15i29.2537>

- [4] Chavarro, D., Orozco, L., García, M., Lucio, D., Lucio, J., Avendaño, C., & Suárez, E. (2021). Propuesta y aplicación de una metodología para estimar la e-preparación de municipios colombianos Proposal and Application of a Methodology for Estimating the E-readiness of Colombian Municipalities.
- [5] Corona Aguilar, A., & Gutiérrez Barbarrusa, V. (2018). Towards Social Inclusion from PAR. An experience in Andalusia Towards social inclusion from the IAP. An experience in Andalusia.
- [6] Regional Autonomous Corporation of Cundinamarca - CAR. (2019). Participation and Social Innovation in Environmental Management.
- [7] Criado, S. C. (2022). The exercise of trade union rights in cooperatives: a study of their regulation in collective bargaining. CIRIEC-España Revista de Economía Pública, Social y Cooperativa, 105, 115–144. <https://doi.org/10.7203/CIRIEC-E.105.24208>
- [8] Cristancho Montenegro, D. L., Rojas Bernal, J. E., Bohórquez Mesa, J., & Dueñas Escudero, M. F. (2020). Analysis of GHG generation in the Bogotá River basin (Colombia) and a comparative overview between the basins of the capitals of Mexico and Peru. Mutis Journal, 10(2), 25–36. <https://doi.org/10.21789/22561498.1674>
- [9] Cuartas Giraldo, M. I., Acevedo Arango, Ó. F., Arias Ramírez, D. A., & Quiroz Cañizares, J. A. (2023). Youth and the Law in Colombia: Youth Citizenship in the Context of Digital Democracy. Opera, 33. <https://doi.org/10.18601/16578651.n33.02>
- [10] Escobar, J., & Bonilla Jiménez, I. (2009). Focus groups: a conceptual and methodological guide. Cuadernos Hispanoamericanos de Psicología, 9(1).
- [11] DANE 2023, Locality of Ciudad Bolívar, social integration data population. https://www.integracionsocial.gov.co/images/_docs/2024/Entidad/localidades/04062024-19-Ciudad-Bolivar-Diagnostico-2023.pdf
- [12] Decree 555 of 2021 [with the force of law]. By which the general revision of the Territorial Planning Plan of Bogotá is adopted. <https://www.ambientebogota.gov.co/decreto-555-de-2021-pot>
- [13] Figueiredo, D. O. (2015). Participatory Action Research: an alternative for social epistemology in Latin America. Journal of Research, 39(86).
- [14] Guevara, I., Pérez, J. M., & Bravo, B. (2023). Impact of the Sustainable Development Goals on educational research on environmental education. Eureka Journal on Science Teaching and Dissemination, 20(2).
- [15] Gutiérrez-Rúa, J., Posada-García, M. D., & González-Pérez, M. A. (2019). HR practices that impact the environmental sustainability strategy. Innovate, 29(73). <https://doi.org/10.15446/innovar.v29n73.78008>
- [16] Hamui-Sutton, A., & Varela-Ruiz, M. (2013). The focus group technique. Research in Medical Education, 2(5). [https://doi.org/10.1016/s2007-5057\(13\)72683-8](https://doi.org/10.1016/s2007-5057(13)72683-8)
- [17] H. Caria, T., Sacramento, O., & Mendes, S. (2023). The construction of field diaries in the study of professional knowledge in social work: a methodological analysis. Qualitative Research Journal, 11(26). <https://doi.org/10.33361/rpq.2023.v.11.n.26.440>
- [18] Holguín Aguirre, M. T., Giraldo Uribe, J. J., Sánchez Muñoz, M. del P., & Valencia Aguirre, E. (2022). Analysis of the solid waste containerization activity in Bogotá. Administration & Development, 52(2). <https://doi.org/10.22431/25005227.vol52n2.7>
- [19] Jiménez Mora, J., Moreno Bayardo, M., & De la Cruz Torres Frías, J. (2023). Meanings about research methodology in doctoral programs in Education. An exploration from its curricular component. Education, 32(62), 161–184. <https://doi.org/10.18800/educacion.202301.007>
- [20] José, C. F. (2022). Digital Competences of Peruvian Business Administration Students A Comparative Study. <https://www.mdpi.com/2071-1050/16/16/6993>
- [21] José, H., & Peñalver, A. J. B. (2022). Creativity in Social Economy entities: a view from multiple cases and a mixed methodology. CIRIEC-Spain Journal of Public, Social and Cooperative Economy, 104, 83–112. <https://doi.org/10.7203/CIRIEC-E.104.21721>
- [22] López, I. G. (2020). Sustainable development SDGs. Editorial Elearning, SL. https://books.google.com.co/books?hl=es&lr=&id=ZSPvDwAAQBAJ&oi=fnd&pg=PA7&dq=objetivo+de+desarrollo+sostenible&ots=uffoleYhFz&sig=5OIIPNo26orVboyMkJmDYJnTwAk&redir_esc=y#v=onepage&q=objetivo%20de%20desarrollo%20sostenible&f=false
- [23] Luna-Gijón, G., Nava Cuahutle, A. A., & Martínez-Cantero, D. A. (2022). The field diary as a training tool during the learning process in information design. Zincography. <https://doi.org/10.32870/zcr.v6i11.131>
- [24] MEN (2018). Special Plan for Rural Education. Ministry of National Education.

- [25] Mercon, J. (2022). Transdisciplinary research and participatory action research in a decolonial key. *Utopia and Latin American Praxis*, 27(98).
- [26] Ministry of National Education. (2018). Special Plan for Rural Education. Towards rural development and peacebuilding. Ministry of National Education.
- [27] Moreno, J. A., & Thornton, G. (2022). Obstruction of climate action in the Spanish far right: Vox's amendment to the Climate Change Law and its representation in the press. *Areas. International Journal of Communication*, 55. <https://doi.org/10.12795/ambitos.2022.i55.02>
- [28] Muños, A. M. C., Bohórquez, M. O., & Díaz, G. A. T. (2022). Knowledge Society and Information Society: two Paradigms for the same Epistemological Reference for Scientific and Technological Progress. *Revista de Filosofía (Venezuela)*, 39(102), 332–345. <https://doi.org/10.5281/zenodo.7045609>
- [29] Osorio González, R., & Castro Ricalde, D. (2021). Approximations to a mixed methodology. *NovaRUA*, 13(22). <https://doi.org/10.20983/novarua.2021.22.4>
- [30] Palacio, D., Hurtado, R., & Garavito, L. L. (2003). Socio-environmental networks in tension: The case of the environmental management of the wetlands of Bogotá. *Networks. Hispanic Journal for Social Network Analysis*, 4. <https://doi.org/10.5565/rev/redes.45>
- [31] Pérez, M. A. (2012). Conceptualization of Sustainable Development: operationalization of the concept for Colombia. *Point of View*, 8(5), 141–157.
- [32] Requena Bolívar, Y. C. (2018). Participatory Action Research and Environmental Education. *Scientific Journal*, 3(7). <https://doi.org/10.29394/scientific.issn.2542-2987.2018.3.7.15.289-308>
- [33] Romero Hernández, C.P. (2022). Megacities: context, climate change and the challenge of urban sustainability https://www.lareferencia.info/vufind/Record/CO_2ab4aa4a365e24aa10a79635958936ce#details
- [34] Sachs, J. D., & Vernis, R. V. (2015). The era of sustainable development (Vol. 606). Barcelona: Deusto. https://staticoplanetadelibroscommx.cdnstatics.com/libros_contenido_extra/31/30978_La_era_del_desarrollo_sostenible.pdf
- [35] District Secretariat of the Environment. (2023). With the POT, Bogotá will have 30% more protected green areas. Retrieved from https://www.ambientebogota.gov.co/nota-principal/-/asset_publisher/vRkc1u7VgGg4/content/con-el-pot-bogota-tendra-30-mas-de-areas-verdes-protegidas
- [36] Veiga, L. L. de A. da, Peixoto, M. A. P., & Xavier, C. S. (2021). Field diaries, metacognition and learning: what we can observe in students of a discipline of the type "learning to learn. *Debates in Education*, 13(31). <https://doi.org/10.28998/2175-6600.2021v13n31p719-743>
- [37] Zuluaga, L. A. R. (2021). The juntadera. The recovery of daily community practices as a form of reparation in palmirita, municipality of cocorná – antioquia. *Antipoda*, 45, 79–100. <https://doi.org/10.7440/ANTIPODA45.2021.04>
- [38] Zúniga-González, C. A., Jarquín-Saez, M. R., Martínez-Andrades, E., & Rivas-García, J. A. (2016). Participatory action research: An approach to knowledge generation. *Rev. Iberoam. Bioecon. Substitution Clim.*, 2(1). <https://doi.org/10.5377/ribcc.v2i1.5696>.