
La inspección de la educación ambiental en escuelas localizadas en ecosistemas montañosos. Propuesta de indicadores

The supervision of environmental education in schools located in mountainous ecosystems

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Resumen: La inspección de la educación ambiental en las escuelas localizadas en ecosistemas montañosos de la región central de Cuba permite controlarla, evaluarla y asesorarla para contribuir a su preservación y desarrollo sostenible ante los riesgos de desastre. Se proponen indicadores para ser utilizados por los inspectores que atienden estas escuelas. Estos se elaboran a partir del estudio de documentos que norman y caracterizan el Plan Turquino, la educación ambiental y la inspección escolar. Los indicadores son parte de la propuesta de una investigación doctoral relacionada con el proyecto “El perfeccionamiento de la educación ambiental en las escuelas del Plan Turquino”.

Palabras clave: Inspección; Educación ambiental; Ecosistemas montañosos; Investigación.

Abstract: The inspection of environmental education in schools located in mountainous ecosystems of the central region of Cuba allows monitoring, evaluating and advising them to contribute to their preservation and sustainable development in the face of disaster risks. Some indicators are proposed to be used by the inspectors who attend these schools. These are elaborated from the study of documents that regulate and characterize the Turquino Plan, environmental education and school supervision. The indicators are part of the proposal of a doctoral research related to the project "The improvement of environmental education in the schools of the Turquino Plan".

Key words: Supervision; Environmental education; Mountain ecosystems; Research.

Introduction

School supervision requires professionals capable of discovering the practical meaning of their knowledge and its application to professional life, in a way that encourages the search for solutions to educational problems, which should translate into more autonomy and

creativity, and consequently into greater involvement in the processes in which they are immersed.

There is ambiguity in the use of the terms inspection and supervision; some authors oppose them. They are used interchangeably, but in this paper we assume the conception of Carrón and De Grauwe, 2003, who state that inspection and supervision are "all services whose main function is to control and evaluate or advise and support principals and teachers" (p. 8) In Cuba, the term supervision is used and is the one assumed in this paper.

School supervision in Cuba, is understood as control, evaluation, and counseling (Ministry of Education, 2010; Rodríguez, 2013), however, it includes others of the considered axes such as: management, administration, school development, educational quality, inspection and school welfare.(Rivera, 2017; Rodríguez, 2013).

With these premises, the so-called integral supervisor arises due to changes in structure that seek greater functionality. This integrality has resulted in other school systems, in which the official, unable to know everything, focuses his attention on the administrative and ignores the didactic and pedagogical in a general sense. This determines the need for a preparation to control, evaluate and advise the processes that are developed in educational institutions. For which it is necessary to consider the issues that must be mastered for school supervision to be contextualized and for schools to occupy, through their actions, the important place they should have in the communities.

Entre los temas de mayor urgencia en cuanto a la preparación de los inspectores cubanos, más allá de los relacionados con sus funciones específicas, se encuentra la educación ambiental, considerada el proceso y el resultado, que con carácter permanente propicia la adquisición de conocimientos, el desarrollo de hábitos, habilidades y actitudes, y la formación de valores del hombre en las múltiples relaciones que establece en el medio ambiente. Desde finales de los años 80 del siglo XX, en Cuba se asume la concepción de educación ambiental para el desarrollo sostenible como política de Estado. (Ministerio de Ciencia Tecnología y Medio Ambiente, 2016).

In the current improvement of the National Education System, environmental education is oriented as an educational component in the subsystems, levels and grades, with the objective that the student demonstrates a positive, creative and responsible attitude towards the environment, from the understanding of the interdependence of the economic, political, social and ecological dimensions of sustainable development and the knowledge of the essential causes that affect it at the local, national and global levels, as a fundamental condition for the maintenance and conservation of its resources and the diversity of life, as well as adaptation to climate change on the planet.

In addition to the above, the necessary dissemination and treatment from the educational point of view of the State Plan for the Confrontation of Climate Change in the Republic of Cuba. Task life, which has among its actions reforestation (Ministry of Science, Technology and Environment, 2017).

To achieve this, the curriculum and all educational activities that are developed in schools must be transformed by incorporating education into the instructional process and making it possible for educational work to occupy an important place in the day's schedule, in such a way that it complements the education that is developed from the teaching-learning process.

Environmental education is fundamental at a time when the planet is facing environmental problems that endanger the existence of the human species, especially in contexts with peculiar characteristics, due to their vulnerability; such is the case of the mountain ecosystems in Cuba, which are served by the so-called Turquino Plan. Places where the contextualization of environmental education is essential given their orientation towards sustainable development due to the characteristics of the environment. These characteristics of mountain ecosystems are taken into account by Valdés, 1996, but without including the participation of school inspectors.

The authors of this article participated in the execution of the project "Environmental education in schools located in the Turquino Plan of Villa Clara", of the Central University "Marta Abreu" of Las Villas", which has as a client the Provincial Direction of Education in the province of Villa Clara, from 2007, carries out diagnoses, strategies, programs and

systems of actions for the incorporation of environmental education in the school pedagogical process.

The proposed indicators are part of a research that concludes with a doctoral thesis in pedagogical sciences and aims at incorporating environmental education in the school supervision of schools located in mountain ecosystems.

Development

The first steps of the Turquino Plan took place in 1959 with the creation of the Rebel Army's Forestry Reforestation Department. In 1960, the Revolutionary Forestry Guard was organized to comply with the Agrarian Reform Law, which established the State's responsibility to maintain and develop the country's forest wealth.

In 1982, the forestry situation was examined by the Revolutionary Government. The Ministers of Agriculture and of the Interior, leaders of the Ministry of the Armed Forces and the directors of the country's forestry companies participated. The lines of development of the activity and the reforestation programs as of 1983 are outlined (Council of Ministers, 2014).

Giving continuity to these actions in 1986, it was proposed and approved to carry out a reforestation pilot project in the municipality of Manatí, province of Las Tunas, with the massive participation of the population. Based on the positive results obtained and on the basis of the methodological and guiding documents prepared, in 1987 the National Reforestation System was launched, covering the entire country.

In support of this program, and due to the strategic importance of the mountains in defense, on July 21, 1987, the Cuban Government approved the creation of the National Commission of the Turquino-Manatí Plan and its provincial commissions to promote the integral development of the mountains, politically, socially and economically. In 1995, the Commission was formalized as an intergovernmental body chaired by the Minister of Agriculture (Council of Ministers, 2014).

Among its objectives are to elaborate and evaluate the policy of each mountain region and its development schemes taking into account the characterization as a protected area of multiple use; stimulate coffee, cocoa, forestry and fruit production, as well as production and services associated with the economy of mountain regions; contribute to the systematic improvement and maintenance of the social and living conditions of the population to ensure their permanence; promote the development and introduction of scientific and technical activities to ensure sustainable development.

In addition, to supervise the works that guarantee the sustainable development and the protection of the ecosystems as well as the reforestation activities; to contribute to accentuate the patriotic-military and cultural traditions of the inhabitants; to support the tasks of defense and internal order; and to integrate the efforts of all the Organisms of the Central Administration of the State, Local Organs of the Popular Power, social, mass organizations, economic, scientific and educational entities, among others, in the interest of assuring the proposed objectives.

In 1995, the Minister of Agriculture officially created the Organs of Attention to the Integral Development of the Mountainous Regions in the Guaniguanico Mountain Range (Pinar del Río); in the Guamuhaya Mountainous System, (covering part of the provinces of Villa Clara, Cienfuegos and Sancti Spíritus); in the Mountainous System of Guamuhaya, (covering part of the provinces of Villa Clara, Cienfuegos and Sancti Spíritus); in the Mountainous System of Guaniguanico, (covering part of the provinces of Villa Clara, Cienfuegos and Sancti Spíritus); in the Sierra Maestra Mountain System, (covers part of Granma, Santiago de Cuba and Guantánamo); and in the Nipe-Sagua-Baracoa Mountains (part of Guantánamo, Holguín and Santiago de Cuba) (National Center for Protected Areas, 2013).

Among the activities and transformations that have taken place in the Turquino Plan, its participation in the reorganization of the business activity that occurred at the end of the 1990s, with the creation of the Mountain Agriculture Business Group, integrating the Agroindustrial Business Groups of Coffee and Cocoa, Forestry of Cuba, Forestry of Pinar

del Río, Cuban Beekeeping Company and the Coffee Associations of Pinar del Río, Escambray, Santiago de Cuba and Guantánamo, which previously existed, stands out.

In 2002, it was agreed to eliminate the Manatí Plan in its name, since the objectives and context of the Turquino Plan are different. Thus, in 2007, Decree No. 280 of the Executive Committee of the Council of Ministers was issued, establishing that the National Commission of the Turquino-Manatí Plan would henceforth be called the National Commission of the Turquino Plan and would be subordinated to the Executive Committee of the Council of Ministers.

It was specified that the Commission, in addition to the four mountainous regions described in Decree 197, should cover the Sierra de Bamburanao, which includes part of the municipalities of Remedios and Caibarién; Yaguajay; Chambas and Florencia in the provinces of Villa Clara, Sancti Spíritus and Ciego de Ávila, respectively; as well as the Ciénaga de Zapata in the province of Matanzas (CNAP, 2013).

The Turquino Plan has had a favorable impact in the mountainous regions of the country, where it has significantly transformed the living conditions of its inhabitants, their food, housing, health, education and communications.

Nevertheless, there has been a significant exodus of the labor force and the general population from the mountains in search of other alternatives and more favorable living conditions in the cities.

The environmental situation in these areas is not significantly different from the rest of the country, but some problems are exacerbated by topography and other factors. According to a report submitted to the National Assembly of People's Power in December 2014, the main environmental problems of the Turquino Plan are related to:

Water pollution: the development of coffee activity and the creation of agricultural and forestry settlements, has raised the vulnerability and dangers related to the deterioration of water quality in specific areas. This is mainly due to the non-existence of systems or incomplete treatment of coffee waste, on the other hand, to the absence or lack of systematic

maintenance of domestic waste treatment systems (latrines, pits and equivalents), which has resulted, in many cases, its collapse.

In addition, there are other violations in the rivers such as vehicle washing, cattle grazing on their banks, sand extraction, construction of dams, and dumping of toxic products for fishing.

Damage to the soil: soil misuse and mismanagement persist and lead to accelerated erosion. Most of the conservation measures that are undertaken are simple, but more complex measures are needed, which require greater financial support.

The formation of gullies is frequent, resulting in surface runoff in the form of a torrent, which carries with it large volumes of soil.

Other factors that contribute to soil loss and impoverishment are: lack of control over production methods to enforce conservation measures; inadequate tillage techniques associated with insufficient protection (live and dead barriers); burning as a method of soil preparation; non-reforestation of river and stream banks; grazing of large and small livestock on land with severe slopes and on the banks of streams.

The construction of mountain roads without considering all the engineering measures to facilitate proper water drainage is an important factor that contributes to soil and slope erosion, causing landslides and mudslides (National Assembly of People's Power, 2014).

Damage and impact on wildlife: the mountain massifs have the greatest wealth of biological diversity in the country, with more than 14,000 species of fauna, mainly arthropods, mollusks, amphibians, reptiles and birds, with a high rate of endemism. Many of them are threatened by: the loss and modification of habitat (plant formations) where a large number of species take refuge, feed and reproduce.

The indiscriminate capture and illegal commercialization, factors that, combined, have increased the threat to certain species of songbirds (negritos, pine martins, butterfly birds, azulejos, catey, parrots). Poaching and fishing that have no real control of what is extracted from nature and can selectively overexploit some species, (jutias, deer and crocodile, among the most frequent) (National Assembly of People's Power, 2014).

Fires in vegetation formations destroy biological diversity; hurricanes cause great damage to forest ecosystems by destroying the foliage, felling trees, thus modifying the food and shelter of many animal species; the introduction of exotic plants and animals, most of the time is harmful to the ecological balance.

Deforestation: forests in the mountains are mostly categorized as forests that protect water and soil, and play an important hydro-regulatory role. The main processes and actions that impact forests are: forest management is not completed and is not used as a guiding element for sustainable management by those who harvest them; the main dasometric rates decrease and environmentally valuable species are reduced; insufficient silvicultural treatments and non-compliance with specialized technical standards in their harvesting for timber; logging is carried out without conserving gallery forests and species not included in the cutting guides, as well as seed-bearing trees; the diversity of forest species used in reforestation and afforestation is still insufficient, sometimes without taking into account the requirements of the soil; and phytosanitary protection is insufficient (National Assembly of People's Power, 2014).

It is significant that this report makes no reference to climate change, which in one way or another has an impact on the aggravation of most of the environmental problems stated to the ANPP in 2014. Nor is there any reference to the deterioration of hygienic sanitary conditions in human settlements, an environmental problem recognized in the 2016 National Environmental Strategy, and which is exacerbated in the areas included in the Turquino Plan due to the hygienic habits present in part of the population.

It is in this context that the pedagogical process is developed in educational institutions, which must contextualize environmental education responding to the social charge of the school, and this is part of what must be monitored, evaluated and advised by the school inspector who attends it.

Articles 16 and 17 of Chapter IV of the Resolution that regulates the school inspection states the methods and procedures to be used, highlighting the application of "observation, document sampling, knowledge, habits and skills checks, as well as interviews, meetings and surveys" (Ministry of Education, 2010, p 3).

Article 19 is dedicated to the concretization of the above methods and procedures in the observation of the personal presence of children, adolescents, young people and workers in the centers, as well as their standards of conduct; the observation of classes, activities and processes carried out in the centers; the observation of methodological activities; the review of the planning documents; the strategies and implementation of the direction of the political-ideological work and learning; the review of the designs and implementation of the methodological work, of the improvement and scientific activity; the review of the fulfillment of the norms and the rigor in the application of the learning evaluation system.

In addition, the sampling of the evaluations applied to the students; the review of notebooks and workbooks of the students and of the teachers' lesson plans; the review of the facilities; the review of the teachers' evaluation and that of the cadres; the review of the prevention plans; the review of the documents established for all teachers; the verification of the educational efficiency indicators; the review of the attendance, retention, learning and promotion indicators; the review of the teachers' work plans and of the teachers' class plans; the review of the facilities; the review of the teachers' evaluation and that of the cadres; the review of the prevention plans; and the review of the documents established for all teachers; the verification of the educational efficiency indicators: attendance, retention, learning and promotion; the review of the minutes of the management and technical bodies, as well as those of the meetings of the school council and the children's circle, as the case may be; and any other activity not included in the previous ones that allows checking the contents subject to inspection (Ministry of Education, 2010).

The school supervision in the educational institutions located in the Turquino Plan, due to its characteristics, must guarantee, enrich and improve the functioning of the school pedagogical process in general and environmental education in particular, which has as its center the care, conservation and sustainable development of the environment, taking care of its monitoring, guidance and evaluation, activities that condition the basic functions of the supervision; control, evaluation and advice that must have their expression from indicators established for the measurement of the result achieved by the directors, teachers and students.

The environmental problems of the Turquino Plan, the role of educational institutions, which should be the most important cultural center of the community, the social mission of the school and the functions of the school supervisor, analyzed as a whole, allow to determine:

Indicators for school supervision of environmental education in educative institutions located in mountain ecosystems (Turquino Plan):

- Determination of the value of the teaching content related to environmental education in the conditions of the Turquino Plan.

The determination of the value of the teaching content related to the environmental problems of the setting is fundamental to incorporate environmental education in the teaching-learning process, this can be controlled and oriented in the Methodological Preparation and evaluated in the class visits.

- Declaration of environmental education in the objective of the classes (whenever the value of the teaching content allows it).

The educational intentionality of the objective of the classes is related to the determination of the value of the teaching content, it is controlled and oriented in the Methodological Preparation, it is evaluated in the Class Plans and the visits to classes. This can be a very convenient motivational element to awaken students' interest in the knowledge, care and conservation of their environment, as well as its sustainable development.

- Incorporation of environmental education in classes based on the value of the teaching content and environmental conditions of the Turquino Plan.

The incorporation of environmental education in classes can be monitored by reviewing the Lesson Plan or evaluated during class visits. However, in conversations with the teacher it is possible to monitor it. This indicator is closely related to those that precede it, but it should not be ignored because it has to do with the moment in which environmental education materializes.

- Use of the environment as a teaching medium.

The environment as a means of teaching is fundamental for the link of the educational institution with the social context; in this case, the conditions of the Turquino Plan, the particularities of these areas must be present whenever the content of the teaching allows it. This is controlled, evaluated and oriented in the Methodological Preparation, the Lesson Plan and in class visits.

- Incorporation of environmental education as an interdisciplinary element.

The interdisciplinary character of environmental education is manifested in the unity of the teaching staff in the planning of their classes, incorporating it in their classes in an intentional way, in the treatment of a certain environmental problem.

- - Presence of environmental education in the Educational Strategy of the institution, contextualized in the environmental problems of the Turquino Plan.

Environmental education in the educational work carried out by the school in extracurricular and extracurricular activities must be present in the Educational Strategy, showing the work carried out for the knowledge, appreciation, care, conservation and sustainable use of the environment's resources.

- Use of environmental resources in the educational facility.

Many schools in remote areas of the Turquino Plan use solar panels to obtain electricity. In addition, many activities can use environmental resources such as wood, rocks, flowers, soil and water.

- Presence in the Prevention Plan of actions aimed at the protection and function of the building in the face of natural phenomena and environmental risks in general.

Most of the educational institutions of the Turquino Plan are located in risk scenarios due to natural and environmental phenomena, so the Prevention Plan should reflect risk assessment actions in this sense and planning of practical preventive activities where students and teachers are aware of how to act in different situations using their own context.

- Incorporation of local environmental issues in family education schools.

The inclusion of topics that reflect the local environmental situation in family education schools offers the possibility of stimulating active participation and the effort to counteract the problems that arise in the daily life of the family and the community, the risks and vulnerabilities; this space should be conceived for collective reflection provoking behavioral changes in teachers, students and families.

- Treatment given to environmental education in the school council as evidenced in the reports of these meetings.

The verification of environmental education in the reports of the school council evidences an adequate projection of the work of the educational institution from the planning of this body where teachers, families and community agents are involved.

- Creation and maintenance of Martí's gardens and/or forests.

Educate in environmental aesthetics and work to contribute to the sustainability and development of the natural resources of the community by promoting values of responsibility and love towards nature, in areas where native vegetation requires protection and sustainable use.

- The educational institution as the center of community environmental education activities.

The potential of educational institutions makes them the most important center of the community, with facilities for the development of environmental education, guaranteeing the sustainability of natural resources and involving community agents. It is the ideal place for talks, debates, exhibitions and the organization of socially useful work. This takes on special relevance in the educational institutions of the Turquino Plan where in many localities and intricate areas it is a meeting place to watch television. These institutions constitute places for recreational activities during the "Vacation Plan".

Logically the methods to control, evaluate and assess are not the same for each of these indicators, they are present in the supervision actions that are carried out, they are part of the process and not isolated elements that complicate it.

It is important that environmental education as an educational component is present in all the activities developed by the educational institutions located in the Turquino Plan.

Conclusions

The characteristics of the context where the pedagogical process is developed in educational institutions located in mountainous ecosystems (Turquino Plan), demand that it is controlled, evaluated and advised in a differentiated way by the school supervisor, linking to this process indicators that can control the environmental education in the result of the acquisition of knowledge, the development of habits, skills and attitudes, as well as the formation of values of man in the multiple relationships established in the surrounding environment, assuming the orientation to sustainable development, not only in the teaching-learning process, but also in the teaching-learning process, skills and attitudes, as well as the formation of values of man in the multiple relationships he establishes in the environment that surrounds him, assuming the orientation to sustainable development, not only in the teaching-learning process, but also in the extracurricular and after school activities, as well as in other functions performed by the school in the community.

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