

Environmental Education within Protected Areas: a Comparative Study between the Conservation Unity in Brazil and the Geoparks in Portugal

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A Brief Background on the Definition and Creation of Protected Areas

Environmental protection is a complex theme. It involves contradictory opinions and philosophical matters that live along within our society due to anthropocentric versus eco-centric perceptions. Regarding territorial and environmental ordering - setting natural areas designed to prevent and conserve biodiversity and other aims -, it involves matters such as defining, creating and managing protected areas.

Subjects like “territory” and “public policies” prevail in debates about protected areas, once, launching these areas, demands governmental interventions. However, as states VALLEJO (2005), “such process has been accompanied by conflicts and impacts that come from the dispossession of social groups (traditional or not) worldwide”. Although, they must be considered biodiversity losses, in face of environmental degradations imposed by society, we must consider them as dispossession of flora and fauna species (VALLEJO, 2005).

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The first evidences of area delimitation, goes all the way back in time to 5.000 b.C. in Mesopotamia, today's Iran, due to the creation of hunting reservation areas as well as policies of area protection, possibly related to lack of animal populations (BENNETT, 1983; OLIVEIRA, 1999).

We are going to find references of such practices in the west, just in the middle age.

They were performed by the upper classes from the Ancient Rome and from the Medieval Europe. They use to draw areas for exclusive use (ROCHA, 2002); there are records regarding the existence of such areas in the times of the Saxon invasion, in 1066 (BENNETT, 1983).

In the year of 1569 a reservation was launched in order to protect the European antelope in Switzerland; in the XVIII century France launched the Royal Parks; in the XIX century, in England, reservations known as "Forest" were created and had occupied a significant part of the British territory. They were used for hunting (QUINTÃO, 1983).

The preservation of most of these areas was related to royal and rural aristocracy needs and interests that did not aim to present concerns with social aspects. Actually, preservation dealt with maintenance of faunal resources and their respective habitats, for hunting practices and/or the protection of forest natural resources to immediate or further use (VALLEJO, 2005).

Between the XVIII and the XIX centuries, political, cultural, economic, social and environmental changes, provided by the Industrial Revolution, altered the way to use and occupy the territory.

The land-work-capital trinomial, which is a capitalist premise focused on production meaning, has changed the ways classical economy dealt with resources from Earth. Since then, they were considered as goods. Environmental degradation was understood as irrelevant. Consequently, there is an increase in the natural resources' degradation and the reduction of empty (territories) areas (OLIVEIRA, 1988).

After the Industrial Revolution - in face of the growing number of workers in factories demanding for outdoor recreation areas -, the demand for public protected natural areas also increased (MILANO, 2000).

Public parks, developed under the perspective of scenic beauty preservation and protection of natural assets against anthropogenic action, started to come up in the United States just in the XIX century.

Actually, the concept of national park as a natural/ wild area was firstly proposed after the almost total extermination of indigenous communities and the expansion of the American borders towards west (MILLER, 1983). The idea of national park came along with the sense of "wildness" (natural/wild life). In 1872 the first National Park in the world was launched – The Yellowstone Park. It became a reserved region and its colonization, occupation or trade was forbidden, according to the American laws (VALLEJO, 2005).

From this moment on, such dichotomous perception between "human presence" and "preservation/conservation" became an effective practice in many countries. Based on such context, human presence is "always devastating" for nature and "traditional populations" are subtracted from areas about to be protected. Typical social aspects linked to man-nature relations were not taken into account.

Starting on the XX century, the creation of new parks added floristic and faunal biodiversity preservation as well as the preservation of gene banks. Under such perspective, they started to serve as labs for basic research in biological sciences (VALLEJO, 2005).

Preservation and Conservation in Brazil

Environmental protection in Brazil, regarding protected areas, meets the political scene of the 60's, after the American initiative of creating the Yellowstone Park. In 1937 the Serra dos Órgãos National Park was created in Itatiaia, as well as the Iguaçú National Park, in 1939.

However, just on the 60's, 70's and 80's that initiatives of creating protected areas were amplified by actions taken by the Brazilian Institute for Forest Development (IBDF) and the Department of Environment (SEMA) (OLIVEIRA, 2009).

Throughout such period, the creation of protected areas met political interests on economical development, instead of meeting real preservation and conservation needs of unique ecosystems, within the Brazilian biomes. It is possible exemplifying such model by the creation of both the Araguaia National Park and Brasilia National Park.

They were part of a process to occupy the countries' internal areas and, at that time, it was called "March towards West" (BRASÍLIA, 2012). Araguaia National Park aimed to bring development to the Araguaia valley and lead towards community settlements, in the Amazon by encouraging cattle breeding, extraction industry, fishing, tourism and river transport. Brasilia National Park was created due to the implementation of the new Brazilian capital. The new capital's urban expansion demanded setting a protected area to preserve watersheds and water resources, in order to provide public supply within the new capital (OLIVEIRA, 2009).

Actually, the creation and maintenance of conservation unities - that we have identified as development policies from the 70's, as a mitigating and/or compensating action resulting from the establishment of infra-structure sites and ventures - were adopted as a public policy strategy which was set as an "acceptable environmental" practice, in Brazil.

At the same time, a concern about planning a national CU (conservation unity) system took place, because such concern became part of the international scenario, due to worldwide debates promoted by the Nature Conservation International Union (NCIU) as well as by the United Nations Organizations for Agriculture and Food (FAF) (MERCADANTE, 2001).

In the beginning of the 80's, the document "Situación de los Sistemas Nacionales de Áreas Silvestres protegidas in América Latina y el Caribe", indicated that only Colombia, Chile, Cuba, Ecuador and Peru already presented a legally established system whereas Brazil, Bolivia and Uruguay still had not started transacting a legislation about the theme (MERCADANTE, 2001).

In 1992, Brazil signed the United Nations Convention on Biological Diversity. It was established by the Ordinance #2519 from March/16th/1998; in May 1992 a bill project was sent to the National Congress. It reminds us about the elaboration of the bill that led to the Conservation Unities National System (CUNS), approved in June, 21st, 2000 and published as a judicial rule in July, 18th, 2000 form of the Law #9985 (MERCADANTE, 2011).

Geo-Parks: Concepts and Background

The concept of “geo-park” evolved from debates set during the 30th Geology International Congress – Beijing, 1996. According to such scenario, discussions between Nickolas Zouros (Greek) and Guy Martini (France) focused on alternatives able to, simultaneously, protect and promote the European geological heritage as well as able to promote local economic development in a sustainable way (Mc KEEVER & ZOUROS, 2005).

However, the proposal of setting geo-parks was taken into practice, in Europe, in 2000, when representatives from four European territories met, in order to discuss a way out to regional socio-economic matters (unemployment, population aging, general economic crises, etc.) as well as a solution based on geological heritage and tourism protection. Such meeting resulted in the signature of a declaration that launched the European Geo-park Net (EGN). It held four members: Maetrazgo Geo-park (Spain), Lesvos Petrified Forest Geo-park (Greece), Vulkaneifel Geo-park (Germany) and Haute-Provence Geological Reservation Geo-park (France).

The concept of “geo-park net” meets one of the fundamental elements related to such territorial strategies, once it enables exchanging experiences and promotes, not just its members, but also the concept of geo-park itself (BRILHA, 2009). The conception of geo-park deals with the fact that the region must have exceptional paleontological and geological elements and also contemplates geo-tourism and the development of local economies, in order to change the socio-economic reality of local inhabitants. It must present sustainable and educational development projects as well (BACCI et al., 2009).

A remarkable aspect of geo-parks deals with ability of matching natural heritage preservation without demanding the removal of local communities. But, does the presence of local communities help the process of preserving local heritage and environmental education? A study on environmental education, applied to geo-parks, can help answering this question.

According to Brilha (2090), a geo-park is a territory geographically well drawn, set in a way to develop a sustainable strategy, based on the conservation of geological heritages, along with other natural and cultural heritage elements, in face of improvements on life conditions of populations living within the country. It means that there is no sense on creating a geo-park, moving out the local population - that have been developing activities there for decades – of its area, in order to preserve and conserve.

The radical “geo” - from the term geo-park - comes from “gea” (Planet Earth – Greek) and presents no straight relation to the term “geology”. Thus, a geo-park is not a geological park, but actually a strategy of territorial development for a place where a certain area must be preserved, conserved and valorized in an integrated form. However it must be done in a way that local communities do not have to be moved out of the local environ to enable environmental preservation and conservation.

Geo-parks’ organization and setting can be done in different ways and must meet local legislations. As per Brilha (2009), to legally frame a geo-park it is demanding to meet a proper integration of it with local/regional/national strategies, to conserve natural values (along with concerns regarding biodiversity preservation) and the territorial ordering, once managing geo-sites implies on establishing certain use restrictions. It is worth highlighting that, in legal terms, a geo-park does not protect an area – national/state/local bills do such protection.

Geo-parks demand complex strategies to be put in practice, once their establishment deals with a work that comprises different social and political actors as well as heads such actors' interests towards local common good.

The proposition of creating a geo-park must consider aspects related to territorial management. To do so, questions such as the following, must be placed:

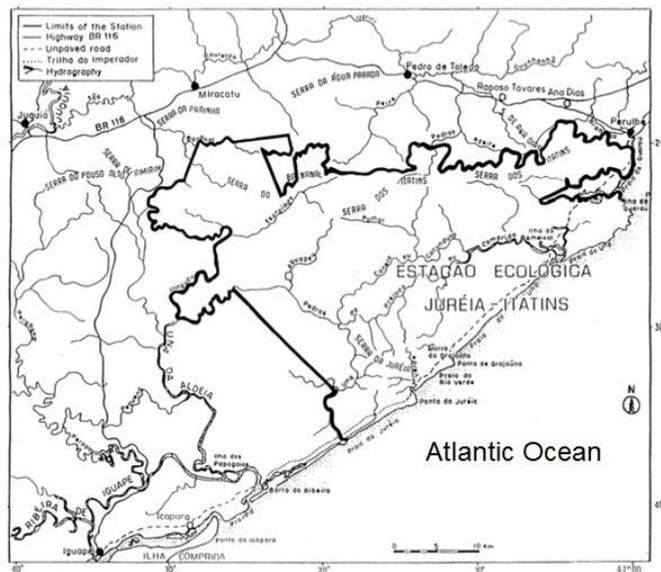
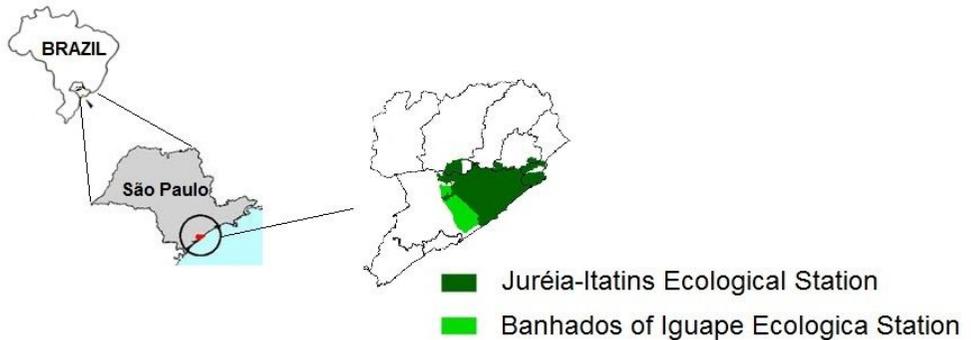
- Do you intend to legally protect an area by setting a geo-park? The proposition does not fit in here, because there are local bills to meet such aim, and geo-parks do not hold power of law;
- Do you aim to develop a park with geological purposes? If this is the aim, all that must be created is a thematic park. There is no need of creating a geo-park for such purpose;

- Is it the proposal articulating local resources (commerce, tourism, etc) in a way to turn them towards the economic development of the local communities by adopting local cultural and natural heritage preservation as the referential? If positive - in this particular case -, a geo-park can be set.

Juréia-Itatins Ecological Station (EEJI) and the Geo-Parks of Arouca and Naturtejo – a Scenario of Protected Areas

Juréia-Itatins Ecological Station

Since the creation of the EEJI, up to the present moment, many problems regarding land ordering showed up as conflicts to be equated. In 2006, the bill that instituted the group of Conservation Unities (CU) within EEJI was reviewed. Initially, its main aim laid on equating matters related to the conflicting use and occupation performed by the population living inside the EEJI' limits: degradation of native forests caused by invaders and the exodus of traditional populations to EEJI' surrounding areas (a fact that is more concerning to humanitarian anthropologists and geographers, once it breaks habits and a culture transmitted through generations). Starting from this process, the limits for the categories that comprise the group - which resulted in expanding the areas of the Ecological Station - were set once more (Figures 1).



The redefinition approved by State Bill #14.892 from April 8th, 2013, placed the area into the ecological station category. Such category is more restrictive within the CUNS scope than it is in relation to the previous mosaic, thus considerably restricting the access, of external populations focused on tourism, to the areas.

Naturtejo Geo-Park

The idea of creating Naturtejo Geo-park was presented in July, 2003, during the workshop “Fósseis de Penha Garcia: Que classificação?” which was organized by the City Hall in Idanha-a-Nova County. The workshop aimed to conserve and broadcast one of the most emblematic geo-monuments in nowadays Naturejo Geo-park – the river canyon of the Ponsul River, in Penha Garcia County.

In March 2004, the following city halls launched an inter-communal tourism company – mostly financed by public capital - called Naturtejo: Idanha-a-Nova, Castelo Branco, Nisa, Vila Velha de Ródão, Proença-a-Nova, Oleiros; and 13 private companies. They aimed to promote economic development using tourism as its engine. The company resulted from the union of six county members of the Nature and Tejo Association. In the same year, the company decided to create the European Geo-park in order to valorize important geological, biological, historical and cultural locations within the area covered by the countries – 4617Km².

The park was called Naturtejo Geo-park from the Southern Plateau, given that Naturtejo's region is mostly placed within the southern plateau, and delimited by the Central Mountain Chain on the north.

Between 2004 and 2005, the inventory of the Geological Heritage was done as well as its connection with cultural heritage and biodiversity, in order to elaborate the application package to be presented to the European Geo-park Net (EGN). Within the same period, conservation, awareness raising and broadcasting actions were taken and headed towards the scientific community, the population within the territory and the public. In July, 2006, the Naturtejo Geo-park was approved by the EGN Coordination Commission. It became the 27th European Geo-park. The last taken step was the integration of it to the Geo-parks Global Net (GGN) from the United Nations for Education, Science and Culture Organization (UNESCO), in September 2006, in Belfast, North Ireland, during the Second UNESCO Geo-parks World Conference – “GEOPARKS 2006”.

Naturtejo Geo-park is located in the central zone of Portugal, on the borders with Spain, on the east. The geo-park's total area comprises 4627 km², according to data from the Portugal Statistics National Institute (PSNI), from 2006 – it means about 5% of Portugal's total area. It also comprises six counties, five of them (Idanha-a-Nova, Castelo Branco, Oleiros, Proença-a-Nova and Vila Velha de Ródão) belong to Beira Baixa, all of them within Castelo Branco District and one (Nisa) in Alto Alentejo, which belongs to Portalegre.

Arouca Geo-Park

In 2005, during the Earth Journeys in Arouca, studies were presented to explain and reinforce the importance of geo-diversities in Arouca region and that it could be used to help sustainably developing the region (VASQUEZ, 2010). The Castanheira nodular granite can be highlighted - the local community – as well as the paleontological estate call it “Pedras Parideiras”, from the giant trilobites of Canelas’ neighborhood, as the most known geo-sites. Then, there was the proposition to set a multi-institutional, multi-disciplinary and international working team, in order to provide scientific support to the creation of the Arouca Geo-park.

In the year of 2006, results from a preliminary study were presented and it talked about the potentialities within Arouca’s region, due to its great variety of scientific and paleontological relevant geo-sites. A broader approach about the territory also cited the existence of important archeological and ethnographic locations that are also expressed in folklore, gastronomy and conventional bakery, in typical villages and local monuments. Its implications - due to the creation of the Geo-park – to the regional development and the support to be given to educational and investigative fields, were also presented.

Distinctions between the Protection and Conservation in Conservation Unities and Geo-parks through Environmental Education

Concepts of Geo-park and Conservation Unities present distinct conceptions, however, both policies intend to protect the natural heritage and, to do so, Environmental Education (EE) – as a work strategy to territorial management – is one of the foreseen tools. It is assumed, according to such scenario, that Environmental Education might lead to attitude changes - in regards to protected regions - by means of cooperative work between management departments and local populations, for total protection or the sustainable use of natural resources. Therefore, we have created a Conservation Unity in Brazil and two Geo-parks in Portugal, in order to elaborate a comparative study which deals with: territory management, the action of actors responsible for managing the departments, the level of involvement by local regional actors (traditional populations, inhabitants, tourists) and the actions taken to promote the involvement of local actors with both formal learning (school facilities) and non-formal learning (community).

School must provide citizenship education and formation, playing an important role in Environmental Education implementation projects within protected areas. According to this, CU's management departments must provide continuous training to teachers as well as specific activities to students from schools inside or around the protected areas.

By analyzing the scientific production as well as the proposals linked to the departments responsible for the CUs in Brazil, it is observed that the Environmental Education developed in such regions is focused on people who visit the system, in eco and ecological tourism and other tourism modalities related to sustainable use activity in some categories of conservation unities, according to CUNS. Environmental Protection must be achieved by the local population, without, however, demanding that such population understands the processes involving the environment in which it is inserted – both processes in physical (terrestrial dynamics) and biological means. Thus, schools, close to or inserted in the conservation unities, would play an important role in face of the communities and, especially, in face of the children and youngsters (OLIVEIRA et al. 2011). Another aspect regards subjects related to the knowledge of actors, from the school scenario (teachers, pedagogic coordinators, school officers, parents and students), about the conservation unity. Such actors should be involved with the EE within the CU. These matters were analyzed according to the Content Pedagogic Awareness – CPC1.

[...] it represents a mix of subjects and didactics through which, one ends up understanding how certain themes and problems organize, represent and adapt themselves to different interests and student's skills as well as are exposed to their learning (SHULMAN, 2005a; 2005b; 2012).

The content pedagogic awareness (CPC) approaches three inter-related fundamental aspects of teacher's knowledge: disciplinary or specific knowledge, which meets the awareness of the discipline; pedagogic or didactic knowledge, which discusses the best strategy to broadcast a certain specific knowledge; and finally, the awareness of context, it means, the reality in which the teaching-learning process takes place. The collected data were categorized and analyzed according to the CPC: specific or disciplinary knowledge, pedagogic or didactic knowledge and context awareness.

Since such categorization was done, it was detected that the actors, involved with a the EE developed in the CU, in Brazil – teachers from public schools inserted in the Juréia Itatins Ecological Station -, feel insecure due to the difficulty of developing Environmental Education (EE) activities, once they were not prepared to it when they were still in college graduation or in any other continuous training (OLIVEIRA et al. 2013).

The Environmental Education process within CU's adopts some models observed for the Geo-parks. Brilha (2005) proposes valorizing geological, biological and regional cultural aspects, besides involving schools inserted in the preserved areas as well as their students, so they can get to know, preserve and broadcast such areas.

Brilha (2005) discusses the “valorization of Geological heritage”, which helps setting the transverse relation between environmental education and geo-parks. According to the author “valorization is understood as a group of information and interpretation actions that will help the public recognizing the value of the geosites”. The author also indicates that products from such valorization must be turned towards the following target groups: the general, school and the most specialized groups. Besides, activities can be developed in different levels, from a punctual scale in a geosite until entire regions. The expression *alternative*, cannot be used, once they are different entities in terms of their meaning, functioning and connection with school activities. Although, without losing the focus on the fact that CU technicians (Ecological Stations and Parks) could help forming teachers and could also get closer to basic education students from the CU areas – even if such activity is not reported in the legislation.

Portuguese geo-parks' educational programs significantly help the practical side of teaching Geosciences by presenting a strong bias with the Environmental Education. It happens because there is the concern of linking the taught content taught by the monitors, in the investigated geo-parks, with the formal official teaching educational program.

Educational programs are essentially broadcasted among schools that annually get the programs and detailed descriptions of the activities. Schools can also apply for monitored visitations. Teachers must access the contents that will be taught during field activities, adapting them to a specific school grade.

It is worth highlighting the fact that a geo-park intends to be a territory able to attract a touristic flow worried with natural and cultural tourism. It is also worth considering that, in most of the cases, people are attracted and return to the geo-park due to the high aesthetic/scenic components. The work performed by monitors involves visitors and makes them understand “what they must observe” (intelligibility) as well as the integration among geosites, with the same geological interests, associated to cultural elements (symbolic values regarding historical and social profiles) or other elements of natural means (biodiversity, diversity or geological, mining or geo-morphological particularities).

NEWSOME & DOWLING (2006) propose developing activities such as: interpretative panels, books, videos, documentaries, manuals, slide shows, computer animations and monitored visitations that can be used as educational strategies. According to the same authors, it is demanding to consider the following factors. in order to select the location: the site’s potential interests to the visitors; an agreement with the landowner; accessibility and safety. Brilha (2005) completes such assumptions, stating that besides such educational and training actions, it is necessary broadcasting the geological, historical and cultural heritage. It can be done by notification of: the local, the activity to be developed as well as the activities already performed.

Examples of Environmental Education in the presented geo-parks are the educational programs of the Naturtejo and Arouca Geo-parks. They were developed according to roadmaps for local exploration, combining elements of the geosite and the pedagogic contents that are part of the disciplinary Natural Sciences’ circle in Portugal. CATANA (2008) developed the educational program of Naturtejo Geo-park. The program was subsequently adapted by ROCHA (2008) in order to be used in the Arouca Geo-park.

The roadmap, besides offering information about the visited locations, developed an active work which proposed debates among students, in order to discuss theoretical knowledge learnt within the classroom. Both the geo-park’s scientific consultant and the monitors supported the elaboration of educational programs. It is important highlighting that all involved professionals were experts graduated in Geology and they all had a master degree in Geo-conservation.

Activities to be performed by the students showed two arms: one, focused on bringing the school community back to the geo-park and the other, to take the geo-parks back to the school community. In the first case, monitors go to the schools and the activities are performed around the school facility, in a way to prepare students to a further field visit. Such activity happens exclusively in schools placed inside the geo-park's area.

The program might have a flexible format and enable adaptations and adjusts according to the audience and the professionals that accompany the youngsters. Tourism monitors or education professionals, although exploring the same locations and themes regarding the geo-park, have a superficial focus and can make little mistakes regarding specific contents. It might be explained by exploiting the idea of SHULMAN's (2005a, 2005b, 2012) pedagogic knowledge of the content, once the initial formation is part of the teacher's activities.

The examined geo-parks' visualization programs set a vehicle between the contents that can be taught and the school matrixes. It makes field visits very attractive for the schools, because they comprise and reinforce formal teaching contents.

Subsides for the Creation of Guidelines Oriented to the Development of the EE within the CUs, in Brazil

The binomial education/environment embodies the possibility of treating the inter-relations of social, economic, cultural and political activities with nature. There is an effort to reveal the fragilities of the eco-system and of mankind itself inside this net -which connects social and political organization modes as well as regions close to the surface of Earth, where the biosphere lays on (as on its planetary set or examined in regional terms). In other words, they try to show that men are not in the center of all things, but they are part of this intricate and multi-faced net called life. Therefore, educating to understand nature changes ethical values within relationships and protecting the environment is a major Education task, mainly when it deals with Environmental Education. But, the awareness of it opens the debate on many and different conceptions about the act of educating and also shows how to capture the environment.

Even if we use the historical milestone from the Environmental Education's background (decisions from the Stockholm Conference, 1968) to define one of its key principles - the need to educate young and adult generations on environmental matters and the formation of a public opinion ready to change individuals, companies and collectivities' attitudes in terms of their responsibility with the protection and the improvement of human conditions -, we have noticed that there are many ways to do it and that there are multiple viewpoints yet to be defended (p.ex., sustainable economy, the conservation of material and symbolic assets).

By bending over the two proposals that promote Environmental Education (CU and geo-park) we are forced to accept that distinct: meanings, infra-structure, legal conditions, etc, opens different possibilities regarding how to conceive and operate the act of educating and, at the same time, present common strategies and methods able to be applied.

As per what was seen above, a geo-park is a territorial development strategy in which a certain area must be preserved, valorized and conserved within an integrated way. It must happen along with the local community, once it is an economic development strategy aiming to preserve and conserve the environment. In order to reach such target, one of its central elements is the educational program found in Naturteja and Arouca.

On the other hand, a CU – mainly ecological stations and parks – is an instrument used to environmental preservation and conservation. It stops almost all the economic activities in the delimited area. One might start from the idea that: livestock, mining, industry and housing are intrinsically harmful items, due to the environmental impact caused by them. Such Impact reduces biodiversity. Even activities as tourism, research and education must be performed according to strict and limiting rules. The Environmental Education defined for the Juréia-Itatins Ecological Station deals with external visitors from the general population.

Both the geo-park and the CU, find, among their main goals, the conservation of certain natural sites that are considered as highly relevant for humankind. They also count on the environmental education as a way to reach such goal.

When we turn ourselves towards the environmental education developed in the Portuguese geo-parks, it is possible observing the search to find ways to keep a close and active relation with schools, teachers and students. It is done by means of educational programs, used to support conservationist goals. The strategy, used by such geo-parks, lays on the elaboration of educational programs that work in harmony with the country's official programs. Therefore, field visits would meet the final proposals.

However, whenever we talk about Brazilian CUs, we can observe a certain distance between the CU and the school. According to a study performed by OLIVEIRA et al. (2011), although the legislation which regulates the CUNS foresees the existence of programs to be applied in school environs, such programs are incipient, if they ever exist. They are basically related with visitors and not with the local community. How is it possible to intend reaching an effective and changing environmental education, if schools and, consequently, the local communities are excluded from the process? Such gap could be filled by educational programs such as those used by the Portuguese geo-parks. As per such programs, the local community insertion model is used by the conservation process. They are put in practice to make CUs and schools closer to each other.

The use of educational programs from Portuguese geo-parks, as a methodology for the Brazilian CU's environmental education, could be applied by matching the selected sites with the themes that are listed in the teaching regular curriculum, taking the contents in the National Curriculum Parameters (NCP) as a reference.

The geo-park presents itself as a revolution in face of how geosciences are broadcasted, once it integrates geological heritage, biodiversity, archeology and other cultural elements, sustainability and the Geo-science contents that are pulverized within the educational curriculum in Brazil.

Such aspect is different from propositions set by other conservation unities – as it is defined by CUNS – that present a conception focused on biodiversity conservation. Thus, the geo-park model differs from the one adopted for the CUs, once the first keeps the regional development and planning perspective whereas the second imposes – due to the CU's categorization – restrictions to use and occupation.

The concept of geo-park is still little known in Brazil, in fact, there are little initiatives to create and develop such development strategy. Araripe Geo-park, for example, is part of a geo-park world net, but it also adopts environmental education strategies quite similar to those that we observe in the CUs (FREITAS et al. 2012a), although the management department aims to join communities and schools (FREITAS et al. 2012 b, 2012 c).

Conclusions

By performing a comparative analysis between Juréia-Itatins Ecological Station – defined by UNESCO as a humankind natural heritage – and the Portuguese geo-parks (Arouca and Naturtejo) - defined by UNESCO's Geo-parks International Net -, we tried to show that models to protect the natural heritage can be set in a way to involve the local population and foresee the regional economic development.

Actually, some of these elements are briefly presented in the Table below. They demonstrate that there are many problems to be solved in order to reach the sustainability expected by the Environmental Education, within protected areas.

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Appendix

| | Conservation Unity Brazil - EEJI | Arouca and Naturtejo Portugueses geo-parks |
|---|--|---|
| Definition | Territorial space and its environmental resources, including jurisdictional waters; with relevant natural features; legally established by the Government, in order to conserve and set limits; under special administrative rules that ensure adequate protection (Bill 9985 from 2000 – CUNNS) | Well delimited territory, with a sustainable development strategies based on the conservation of geological heritages and other elements of the natural and cultural heritages, in order to improved life conditions of the population living within its territory (Brilha, 2009) |
| Use and occupation | Territorial space protected by law in order to preserve the environment | Territorial strategy that aims to preserve the local natural environment and preserve the historical and cultural ones. Besides preserving, it also aims to lead to regional sustainable development |
| Management | Public management | Combined private and public management. They have a management unity responsible for decision-making, managers and a unity comprising a group of technicians to operate daily routines. |
| Legal aspect | Legal protection of natural areas. The initiative comes from the government and follows a rigid legislation. | Geo-parks' organization and creation can present different forms and they adapt themselves with the local legislation. |
| Educational programs with visitation | The legislation demands the creation of an education environmental program – actually, it is not done. | Develop educational programs as one of its general goals <ul style="list-style-type: none"> - Actually, there is an structured visitation program related to the formal teaching curriculum program - The guides are teachers with master degree in geo-sciences. |
| Geo-sciences teaching and environmental education | Do not exist | It is done through educational programs that are linked to the formal teaching curriculum program. |
| Aspects developed by the educational programs | Just biodiversity and sustainability | It integrates geological heritages, biodiversity, archeology, other cultural elements and sustainability. |
| Traditional communities | Preserving the natural heritage in order to remove local communities in most of the cases. <ul style="list-style-type: none"> - Conflicting relation in which local communities are excluded from the preservation process. | Natural heritage preservation without removing local communities. <ul style="list-style-type: none"> - Good relationship with the communities in within the geo-park area. It also helps the development in such communities. |
| Relationship with local teachers, schools and students | There is no relationship with teachers, schools and students. | Close relation with schools, teachers and students – workshops, pedagogic support for environmental themes; help schools in their environmental projects. |