



## **Environmental Education and ecotourism concepts in Marine Protected Area of Armação de Búzios, Rio de Janeiro, Brazil: reflections for the adoption of coastal ecotourism**

### ***Concepções de Educação Ambiental e ecoturismo na Área de Proteção Ambiental Marinha de Armação de Búzios(RJ): reflexões para a adoção do ecoturismo costeiro***

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#### **ABSTRACT**

Environmental Education for Sustainable Societies and Global Responsibility (EESS) is aimed at transforming society and its negative impacts on the environment by way of financial and political emancipation, whence ecotourism becomes one of the best options towards environmental sustainability. This study aimed at evaluating social actors' conceptions on Environmental Education and ecotourism, in order to base the development of future marine-ecotourism activities in the Marine Environmental Protection Area of Armação de Búzios (MEPAAB). Sampling involved 73 respondents interested in the implementation of marine ecotourism in the area. Their concepts, as regards ecotourism and EESS, were analyzed according to individual profiles. The sample was mainly composed of Argentine and Brazilian tourists from the cities of Buenos Aires and Rio de Janeiro, when visiting MEPAAB. Since most of the concepts were limited to environmental conservation and public awareness, these were considered entirely or not entirely adequate. The results could not be significantly associated with the age of respondents or any other factor (Kruskal-Wallis,  $p > 0.05$ ). The concept of ecotourism was the better known. Even so, significant differences were observed only among the different classes by income. There were clear indications of the urgent application of EESS in the coastal environment, as a plausible management tool for the littoral municipalities of Rio de Janeiro State.

**KEYWORDS:** Coastal Protected Areas; Environmental Awareness; Environmental Education; Coastal Ecotourism; Armação de Búzios.

## RESUMO

A Educação Ambiental para Sociedades Sustentáveis e Responsabilidade Global (EASS) visa transformar a sociedade e seus impactos negativos no meio ambiente por meio de sua emancipação política e financeira e o ecoturismo é uma das melhores alternativas para a realização de EASS visando a sustentabilidade ambiental. Este estudo objetivou avaliar as concepções de atores sociais de “Educação ambiental” e de “ecoturismo”, com vistas a subsidiar o desenvolvimento de atividades de educação ambiental na Área de Proteção Ambiental Marinha de Armação de Búzios (APAMAB). Para isso, foram entrevistados 73 sujeitos interessados na implantação de ecoturismo marinho na área, seus conceitos sobre ecoturismo e EASS foram analisados de acordo com seus perfis. A amostra foi composta principalmente por argentinos de Buenos Aires e brasileiros do Rio de Janeiro que visitam APAMAB em busca de turismo de sol e mar e outras modalidades de turismo. A maioria das concepções sobre EESS foram totais ou parcialmente inadequadas, seus conceitos foram limitados à conservação ambiental e conscientização pública e estes resultados não se apresentaram significativamente associados com a idade dos entrevistados ou outro fator estudado (Kruskal-Wallis,  $p>0,05$ ). O conceito de ecoturismo é mais bem compreendido pelos entrevistados e diferenças significativas foram apresentadas somente entre classes de renda. Este estudo demonstrou a urgência de ações no âmbito da EESS em ecossistemas costeiros como uma ferramenta de gestão ambiental pública em municípios do litoral do estado do Rio de Janeiro.

**PALAVRAS-CHAVE:** Áreas Protegidas Marinhas; Cuidado Ambiental; Educação Ambiental; Ecoturismo; Armação de Búzios.

## Introduction

In Brazil, many are the obstacles for marine environmental conservancy, as the inefficiency of the regulatory frameworks, despite the vast legal basis (JABLONSKI; FILET, 2008). The creation of marine protected areas has increased, although, in many cases, there is a lack of appropriate management plans. This situation is largely due to the overall low educational level of the population. There is an urgent need for political decisions, as a means of counteracting and solving the serious conflicts generated by the different concepts of the use of protected areas.

In countries like Brazil, with their enormous social and environmental disparities, marine and coastal ecosystems are often the major targets for the development of unsustainable growth plans, that cannot be controlled, much less avoided, by the supervision, detention and application of fines alone (MMA, 2010). In this context, Environmental Education (EE) stands as a relevant tool for the efficient management of marine protected areas (BERCHEZ *et al.*, 2005). Marine Environmental Education (MEE) can be developed, for example, by means of marine ecotourism (FORESTELL, 1993; GARROD; WILSON, 2004; PEDRINI *et al.*, 2011). However, any marine-ecotourism project should include the following characteristics: a) reference to a specific environment; b) focus on small groups; c) aims, as regards environmental education; and d) inclusion of the local community. As

in any project, the prior identification and evaluation of environmental perception by potential agents and customers is essential.

Environmental Perception (EP) has been adopted as a diagnostic tool both in a social and environmental contexts (PEDRINI *et al.*, 2010a; ROCA *et al.*, 2008), aiming at identifying cognitive perception of environmental issues, as this is assumed a reflection of the routine of the analyzed public. Whyte (1977), on summarizing field methods for research on EP, emphasized its excellence as a means for exposing and diagnosing problems, and of conveying possible solutions to socio-environmental problems, by identifying man's individual and collective understanding of the environment. Although in EP research reality can sometimes be interpreted through the eyes of researchers, as predisposed by their own ideologies, many critical and invaluable reflections can also be generated, since it deals with the interconnection between society and the environment. The results achieved by EP researchers can almost be understood as social representations of the subjects studied, according to an interactive group of social actors, who can change their reality, when incorporated into new constructs leading to effective insights (REIGOTA, 2007).

EP research must always precede any EESS activity, as it facilitates the prior diagnosis of conceptions (PEDRINI *et al.*, 2010a; REIGOTA, 2007). Briefly, the understanding of constructs that emerge from the persons analyzed can be useful towards demolishing misconceptions and reconstructing concepts.

We can apply this idea to coastal and marine environmental education projects. Many studies show the disastrous effects of tourism on the Brazilian coast, even within nature conservation units (NCU), by presenting situations in which erroneous environmental education is placed in evidence (BERCHEZ *et al.*, 2005; MELO *et al.*, 2005; PEDRINI *et al.*, 2007; SILVA; GHILARDI-LOPES, 2012). Moreover, environmental education devoted to marine environments scarcely appears on the worldwide academic scene (MADIN; FENTON, 2004; ORAMS, 1997; TOWNSEND, 2003). Many environmental education projects that aim at social and marine environmental maintenance should consider marine ecotourism as one of the most effective tools, and consider it as a plausible alternative to traditional tourism, which, apart from the infinite controversies placed in evidence, is falsely presented as a promise of economic development. Coastal and marine environmental education in Brazil is still in an early stage, having been implemented only in the beginning of the 21<sup>st</sup> century (BERCHEZ *et al.*, 2007; BERCHEZ *et al.*, 2005; GHILARDI-LOPES *et al.*, 2012; HADEL, 2010; VASCONCELOS *et al.*, 2008).

Environmental education for sustainable societies (EESS), which aims at emancipating citizens and the community, and consequently changing the predatory posture by a sustainable one, has been characterized by Czapski (1998) and Meira e Sato (2005) and, for the marine environment, by Berchez *et al.* (2007) and Pedrini *et al.* (2011). The implementation of EESS in Brazilian context, aiming communitarian emancipation through a participatory process, surely converges synergistically with the objective of the Brazilian national program of environmental education - ProNEA (BRASIL, 2005), which is mainly related to the awakening of a socio-environmental

awareness, focusing on local knowledge and reality, in an interdisciplinary approach that encourages permanent environmental conservation.

Since the term *ecotourism* first appeared in Brazil, it is often understood to simply mean *tourism in wild and untouched environments*. The broader knowledge of the EESS concept, compared to the ecotourism's one, should be related to the fact that environmental and EESS themes are more often discussed in different media, education institutions and communities, together with other possible contexts. Hinzte (2008) emphasized that the ecotourism concept is nothing more than a kind of environmental show business, aimed at meeting the demands of a capitalistic consumer society. Although various researchers presented their opinions about ecotourism, most of them ultimately converged to this common concept. The concept of ecotourism adopted in the present study was based on Pires (2002), Pedrine (2006) and Neiman and Rabinovici (2008). The specific concept of marine ecotourism is very much misunderstood by the marine-tourism industry. Disagreement is mainly related to its goals, with its focus on social and environmental sustainability. Marine ecotourism activities involve certain necessary conceptual characteristics. Furthermore, concepts that include the participation of local communities must be sought, with the forthcoming simultaneous financial and environmental education benefits, and involving a minimal negative environmental impact, and a limited number of customers (GARROD *et al.*, 2002; PEDRINI *et al.*, 2010b). Coastal and marine trails, which are still rare in Brazil, are more commonly used for ecotourism and EESS (PEDRINI, 2013; PEDRINI *et al.*, 2010b) in the states of São Paulo and Santa Catarina (AYROSA, 2011; BERCHEZ *et al.*, 2007; WEGNER *et al.*, 2006). This kind of activity is a powerful tool for introducing the marine environment, as well as achieving tourist environmental awareness.

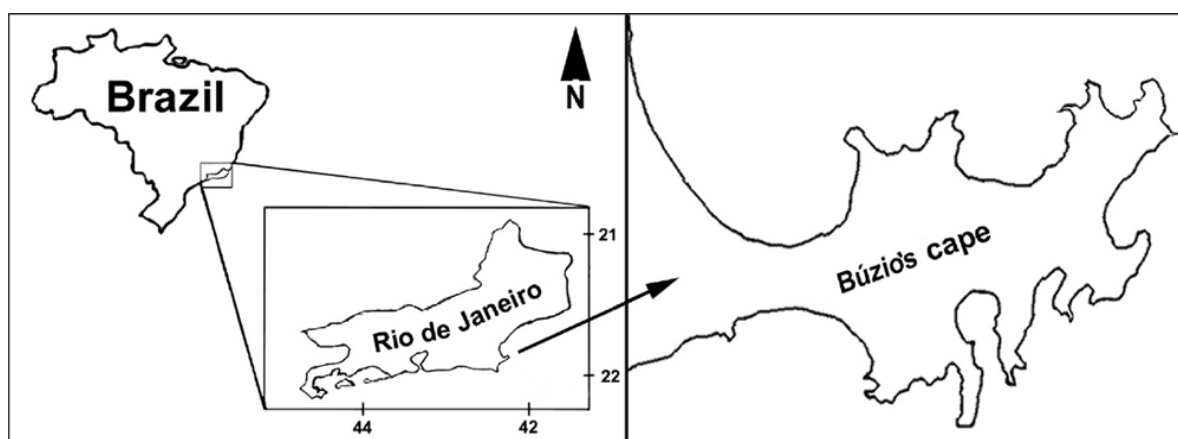
This study aims at evaluating *Environmental Education* and *ecotourism* concepts of social actor involved with Armação dos Búzios (Rio de Janeiro, Brazil) in order to base the development of future coastal and marine-ecotourism activities (GARROD *et al.*, 2002) in the area.

## **Material and methods**

### ***Local focused on the study***

This study is focused at Armação dos Búzios, located in the state of Rio de Janeiro on the Búzios Cape – 22° 44' 56" S 41° 52' 53" W (Figure 1). It is one of the most coveted tourist-spots in the country due to its extremely beautiful sunny beaches, its sea and exuberant nature (MMA, 2010).

In 2009, the municipal government created the Marine Environmental Protected Area of Armação dos Búzios (MEPAAB) and the Coral Municipal Natural Park. However, since its implementation occurred very slowly, a massive tourism gradually began to degrade its beautiful beaches and shoreline (PEDRINI *et al.*, 2011). Oigman-Pszczol and Creed (2007) qualified and quantified the marine trash in ten beaches in the area. In total, 16,000 items of trash were classified in seven categories, with cigarette filters representing the most abundant.



**Figure 1:** Geographic localization of Búzios Cape.

**Figura 1:** Localização geográfica do Cabo de Búzios.

According to Castro (2011), in the summer of 1997-1998, Armação de Búzios received 26 marine cruisers transporting 25,000 passengers. In 2011-2012 season, this reached 223, with an estimated number of 482,000 passengers. Castro (2011) mentioned the inconvenience of this activity without adequate government regulation aiming at environmental conservation. Pedrini *et al.* (2011) mentioned the combined efforts of the Armação de Búzios Department of Environment and Tourism and the Rio de Janeiro State Department of the Environment, to limit the negative environmental impact caused by transatlantic ships along the coast of Rio de Janeiro. One of the measures taken was to limit simultaneous access to the continent to only two ships at the same time.

### ***Sampling strategy and data analyses***

A questionnaire was sent by email, using the “snowball method”, to social actors involved with and interested in Armação dos Búzios (e.g. traders, hoteliers, local residents, teachers, etc.). This technique is a non-probabilistic method used in social researches, in which the initial participants indicate new ones, which in turn indicate others and so on, until a great number of people are reached. The questionnaire was also distributed to the main Brazilian networks dealing with environmental education and the environment itself.

The first part of the questionnaire was related to the respondent profile (gender, age, occupation, reasons for visiting Armação dos Búzios, region of origin, income). The second part was constituted of two open questions: 1) What is your definition of environmental education? and 2) What is your definition of ecotourism?

The analysis centered on conceptual indicators which appeared in the respondents answers. The Environmental Education Construct adopted is in accordance with the classification of Czapski (1998), Meira e Sato (2005) and Pedrini (2007) and was synthesized for the studied context, according to Table 1. A scale, related to the number of indicators present in the participants' responses related to the concept, was employed for evaluating

the questionnaires. An appropriate response should present 4 to 7 indicators, a partially appropriate, 2 to 3, and an inappropriate, 0 to 1 (Table 1).

Table 1: Analyzed EESS indicators and their descriptions.  
Tabela 1: Indicadores de EASS analisados e suas descrições.

Indicators	Description
Emancipatory	Allows the generation of income
Transformative	Enables changing of attitudes for the development of sustainable societies.
Participative	Encourages participation in collective mobilizations
Embracing	Involves all social groups
Permanent	Made as continued activity (or continued EESS)
Contextualized	Acts directly on the reality of the activity and achieves global dimension
Interdisciplinary	Integrates different knowledge

The ecotourism construct was based on Pires (2002), Pedriani (2006) and Neiman e Rabinovici (2008). Again, a scale, related to the number of indicators present in the participants' responses related to the concept, was employed in order to evaluate the responses. An appropriate response should present 3 to 4 indicators; a partially appropriate, 2 to 3 indicators and inappropriate, 0 to 1 indicator (Table 2).

**Table 2:** Descriptive parameters and indicators expected in the answers of the respondents, regarding the ecotourism concept.

**Tabela 2:** Parâmetros e indicadores descritivos esperados nas respostas dos respondentes, relacionados ao conceito de ecoturismo.

Parameters	Expected indicators in the answers of the respondents
Area characteristics	Implemented in a natural area
Community involvement	Local community involved
Main focus	Focus on interpretation/environmental education
Costumers group size	Limited number of costumers at a time

The data were inserted into a spreadsheet (Microsoft Excel) for posterior analysis of the influence of the respondent's profile on comprehension of the concepts "environmental education" and "ecotourism", according to the attributed grades 0 (inappropriate), 0.5 (partially appropriate) or 1 (appropriate). The chi square and Kruskal-Wallis analysis were applied to identify significant differences ( $p < 5\%$ ) between these grades, by age, gender, occupation, region of origin (Lagos Region – which includes Búzios, Cabo Frio and Arraial do Cabo, all three in Rio de Janeiro and near Armação dos Búzios – or other) and income.

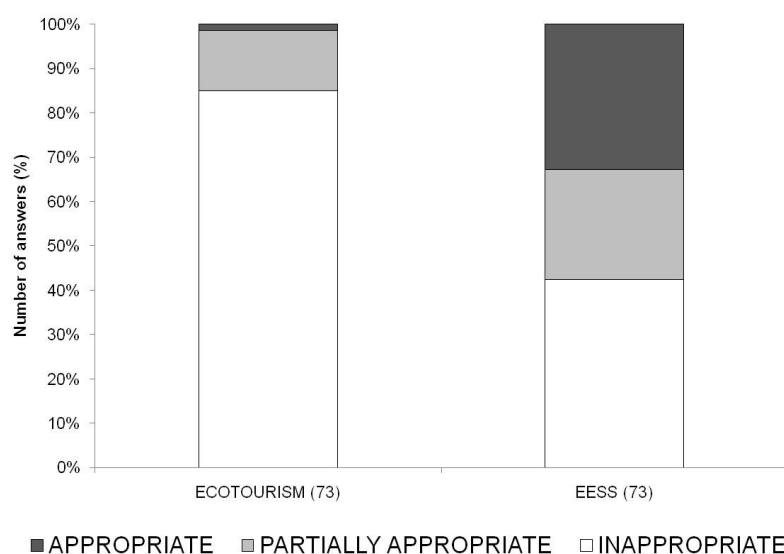
## Results and discussion

### Public profile

There was 73 respondents, of which 41 were male (55%) and 32 were female (45%). The age varied from 16 to 60 years old, with a predominance of people 41 to 50 years old (28%). The schooling ranged from elementary school (8.8%) to post graduation (2.5%). More than half of the participants (68%) presented university level. It was possible to notice that great part of the respondents (53%) declared incomes between 1 to 4 minimum wages. The local dwellers represented 19.2% of the respondents and 14.1% were people who used Armação dos Búzios as bathers. When asked about the reasons why they visited Armação dos Búzios, they cited Ecotourism in second place.

### EESS and Ecotourism concepts

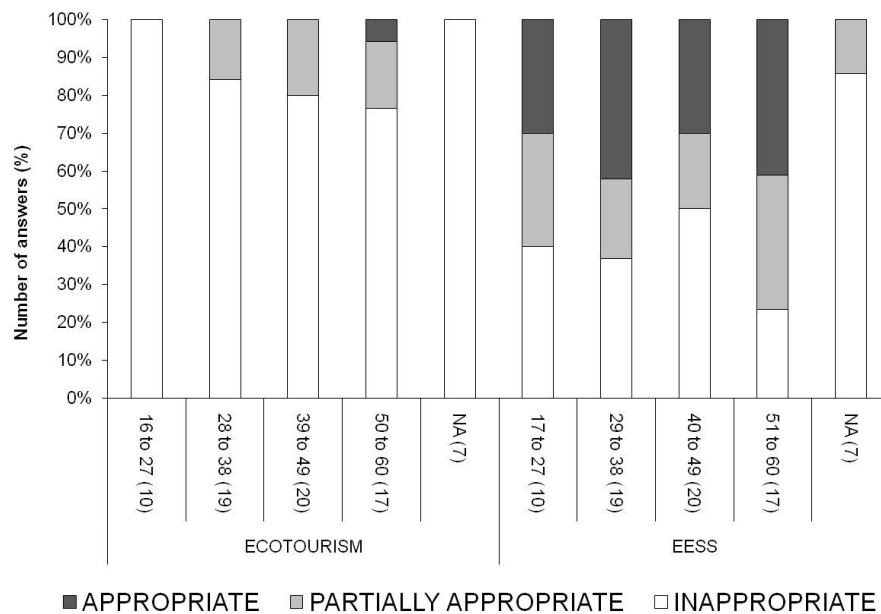
Considering the indicators proposed for EESS concept, it was noticed that 33% cited all indicators, 25% cited at least half of the indicators and 42% didn't cited any of the indicators presented at Table 1. Generally speaking, respondents presented a significantly (Chi-square,  $p = 0.0000$ ) better performance for EESS concept than for the ecotourism concept (Figure 2).



**Figure 2:** Percent number of inappropriate, partially appropriate and appropriate answers about ecotourism and EESS concepts from total sample.

**Figura 2:** Percentual da amostra total de respostas inapropriadas, parcialmente apropriadas e apropriadas sobre as concepções de ecoturismo e EASS.

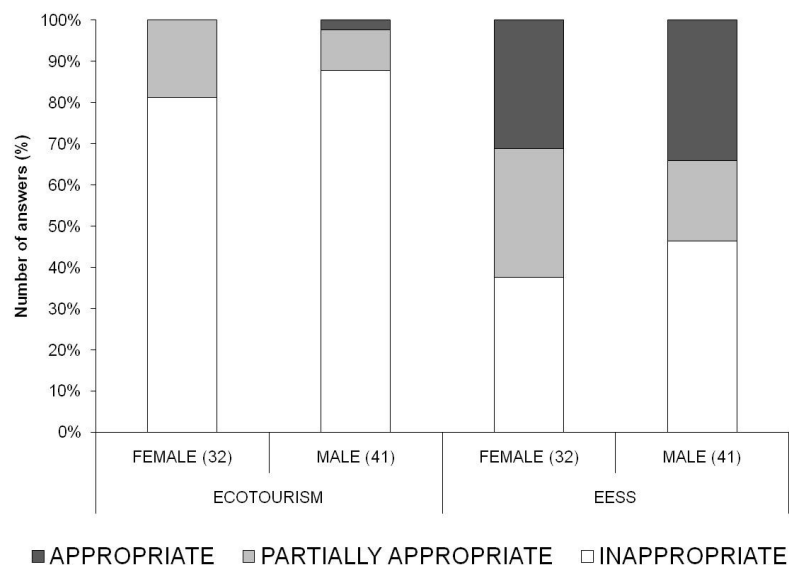
Regardless of age group, a significant (Kruskal Wallis,  $p < 5\%$ ) higher knowledge about EESS than about ecotourism was observed. Some respondents of 50 to 60 years old presented higher knowledge about ecotourism (Figure 3).



**Figure 3:** Degrees of respondent-knowledge (in %) about ecotourism and EESS, according to age group (sample size in parenthesis).

**Figura 3:** Graus de conhecimento dos respondentes (em %) sobre ecoturismo e EASS, relativos à faixa etária (tamanho amostral entre parêntesis).

Regardless the gender of respondents, the knowledge about ecotourism was significantly (Kruskal Wallis,  $p < 5\%$ ) inferior than the knowledge about EESS, although some male respondents presented some knowledge about ecotourism (Figure 4).



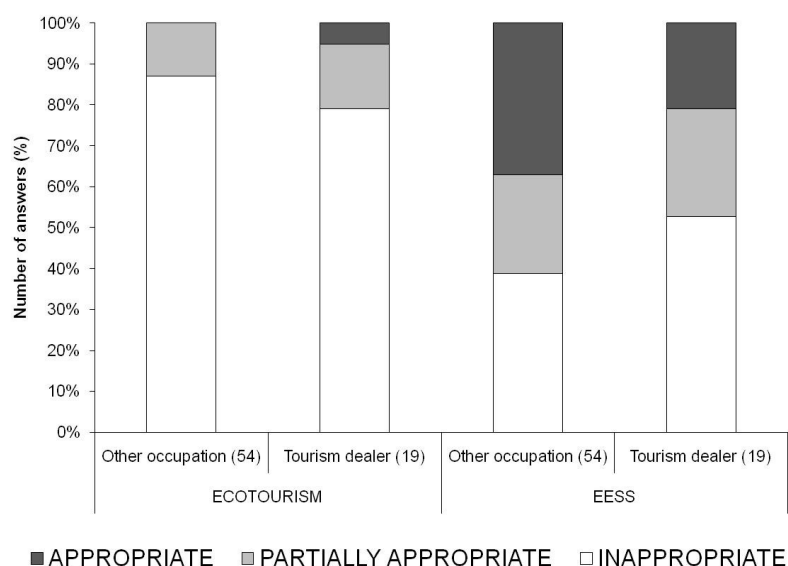
**Figure 4:** Degrees of respondent-knowledge (in %) about ecotourism and EESS, according to gender (sample size in parenthesis).

**Figura 4:** Graus de conhecimento dos respondentes (em %) sobre ecoturismo e EASS, relativos ao sexo (tamanho amostral entre parêntesis)

Regardless the respondents occupation, they presented significant higher knowledge about EESS (Kruskal Wallis,  $p = 0.000$ ) than ecotourism, and few tourism dealers presented some knowledge about ecotourism or EESS.

Due to the lack, not only of government control of the ecotourism products offered, but perhaps also of knowledge of adequate concepts and approaches by the generalized public and tourism-dealers, the consumer ended up by concluding that ecotourism is simply tourism in natural areas (PIRES, 2002). As Hintze (2008) and Neiman and Rabinovici (2008) emphasized, this erroneous approach can be summarized, as follows: Ecotourism is a kind of spectacle that exclusively meets the demands of capitalistic consumer societies, or, in other words, a purely entertainment product, with nature as merely the accompanying scenario.

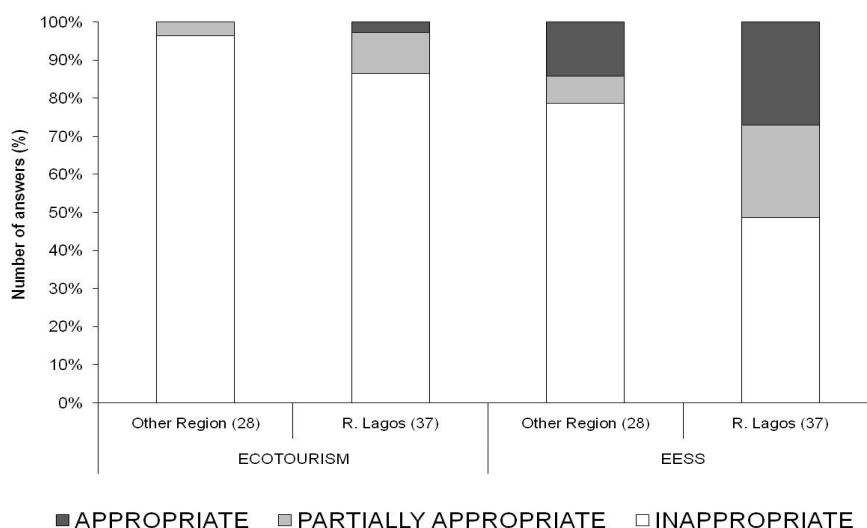
This could explain their misuse of environmental scenario, opportunistically explored. In fact, they elude the unaware consumer, by simply offering tourism in natural environments without any real effort in relation to EESS, and even worse, in a massive approach, which is radically contrary to the very concept of ecotourism (PEDRINI; MERIANO, 2007) (Figure 5).



**Figure 5:** Degrees of respondents' knowledge (in %) about ecotourism and EESS, according to occupation (sample size in parenthesis).

**Figura 5:** Graus de conhecimento dos respondentes (em %) sobre ecoturismo e EASS, de acordo com a ocupação (tamanho amostral entre parêntesis)

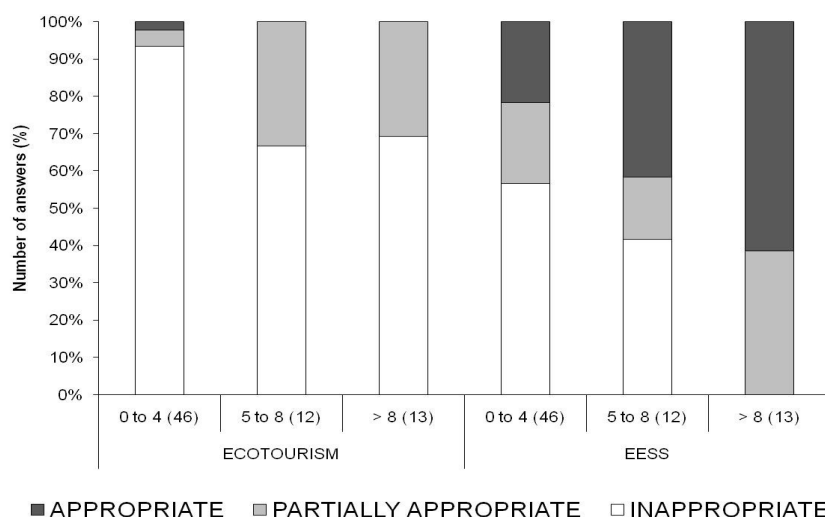
People from the Lagos region (R. Lagos) knew less about EESS and ecotourism than people from other regions. Generally, respondents' knowledge was more appropriate for EESS than for ecotourism. (Kruskal Wallis,  $p = 0.000$ ). This higher knowledge of EESS of people outside Lagos Region could be related to the few efforts by regional municipalities towards introducing environmental questions through municipal agendas. Pedrini et al. (2012) registered little interest by coastal municipalities of Rio de Janeiro State in refresher training focused on EESS, as a structural action for counteracting negative tourism effects (Figure 6).



**Figure 6:** Degrees of respondent-knowledge (in %) about ecotourism and EESS according to region of origin (sample size in parenthesis).

**Figura 6:** Graus de conhecimento dos respondentes (em %) sobre ecoturismo e EASS, relativos à faixa etária (tamanho amostral entre parêntesis)

Respondents' knowledge varied significantly according to the income, for both EESS and ecotourism (the higher the income, the better the knowledge - Kruskal Wallis,  $p = 0.000$ ). Also, knowledge about EESS was generally higher than ecotourism (Figure 7). Wider knowledge of the EESS concept, compared to the ecotourism one, should be related to the fact that, environmental and EESS themes are more often discussed in different media, education institutions and communities, together with other possible contexts. Aiming at attending to what was established in the "Programa Nacional de Educação Ambiental" (ProNEA), in Brazil (2005) it is foreseen that EESS will be implemented in all Brazilian contexts (Figure 7).



**Figure 7:** Degrees of respondent-knowledge about and ecotourism and EESS according to income (considering the number of Brazilian minimum wage gains) (sample size in parenthesis).

**Figura 7:** Graus de conhecimento dos respondentes (em %) sobre ecoturismo e EASS, de acordo com a renda (considerando o número de salários mínimos ganho) (tamanho amostral entre parêntesis).

Equally, Oliveira *et al.* (2011) and Rangel *et al.* (2014) conducted experiments on marine ecotourism with practitioners of the highest salary level (> 2,000 euros / month and 59% with higher education). The people who practiced ecotourism interpretation / environmental education (IE or EE) by marine trails at the nearby beaches of Algarve in southern Portugal considered the inclusion of IE / EE in ecotourism as a good option to the conservation of the Portuguese marine environments. Thus, the introduction of EE in marine ecotourism was considered an appropriate approach to the conservation of temperate marine environments.

Many people may have the wrong idea that EESS and tourism are incompatible activities, but if the EESS activities are well planned and based, they can help tourism instead. For example, according to Orams (1997), in a work related to ecotourism activities focused on dolphins-watching, education programs actually increased tourists' level of enjoyment. Also, Lück (2003) showed that tourists clearly indicated that they would have liked to receive more information, in particular about the wider marine environment. Lastly, diving tourists in Portugal perceived the existence of marked trails in EESS activities as a way of enhancing the preservation of the local biodiversity and reported this experience as "good" or "excellent" (OLIVEIRA *et al.*, 2011).

## **Conclusions**

Some points evidenced by this study could be listed: tourism costumers and dealers in Armação de Búzios had little interest or knowledge in relation to EESS and ecotourism. In general, the EESS concepts were inappropriate, considered by the majority as "achieving public awareness aiming environmental conservation". Results regarding comprehension of ecotourism were also very poor, with only 1% presenting an appropriate conception. Disparities in the access to cultural capital could be the explanations for the poor results about the concept of ecotourism among local tourism dealers.

The present study contributed to the understanding that the knowledge about indispensable key-concepts for the development of marine ecotourism with socio-environmental sustainability in MEPAAB are below the minimum desirable. However, this may be explained by the fact that marine ecotourism products still do not exist in Brazil, despite the increased demand among tourists for activities which show the sea and its characteristics. Ecotourism entrepreneurs seem to offer by products that in fact only show the sea by its aesthetic aspect as landscape and without any interpretive lecture. It is up to local governments to adopt the academic concept as a basis for standardization of business activity regarding marine ecotourism products. Thus, the society will be able to actually buy marine ecotourism products with EE, starting to: a) interpret the marine environment; b) save the sea with their primordial characteristics for future generations; c) stimulate that the host communities receive their share of the profits of that activity; d) monitor the activity as a citizen. Thus, the sea with its peculiar characteristics can be properly maintained, even though being enjoyed for economic purposes.

In conclusion, the development of ample programs of environmental education and ecotourism on the local marine environment is imperative in

order to perpetuate the coastal ecosystems in Armação dos Búzios. The implementation of marine ecotourism products in MEPAAB should be explicitly defined and standardized by the city hall, as for example, that the practice of marine ecotourism products must happen in preserved natural environments, including the environmental interpretation / education, involvement of social actors from the local tourism chain, distribution of profits and obligations, minimization of negative environmental impacts by customers and limited number (up to ten) customers per product.

## References

- AYROSA, C. R. Trilhas subaquáticas guiadas: uma alternativa sustentável para a conservação do ambiente marinho. Estudo de caso da Ilha do Campeche, Florianópolis/SC. In: **Anais do SEB, X Congresso de Ecologia do Brasil**, 2011. São Lourenço, Brazil. SEB. p.2.
- BERCHEZ, F.; GHILARDI, N.; ROBIM, M. J.; PEDRINI, A. G.; HADEL, V. F.; FLUCKIGER, G.; SIMÕES, M.; MAZZARO, R.; KLAUSENER, C.; SANCHES, C.; BESPALC, P. Projeto Trilha Subaquática: sugestão de diretrizes para a criação de modelos de educação ambiental em unidades de conservação ligadas a ecossistemas marinhos. **OLAM Ciência & Tecnologia**, v. 7, n. 3, p. 181-209, 2007.
- BERCHEZ, F. A. S.; CARVALHAL, F.; ROBIM, M. J. Underwater interpretative trail: guidance to improve education and decrease ecological damage. **Int. J. Environment and Sustainable Development**, v. 4, n. 2, p. 128-139, 2005.
- BRASIL. **Programa Nacional de Educação Ambiental - ProNEA**. 3. Brasília: MMA, 2005. 102 p.
- CASTRO, C. B. Cruzeiros de turismo em Búzios: prós e contras. **Projeto Coral Vivo Notícias**. Rio de Janeiro. 17: 1-2 p. 2011.
- CZAPSKI, S. **A Implantação da Educação Ambiental no Brasil**. Brasília: Ministério de Educação e do Desporto, 1998. p.
- FORESTELL, P. H. If Leviathan Has a Face, Does Gaia Have a Soul - Incorporating Environmental-Education in Marine Ecotourism Programs. **Ocean & Coastal Management**, v. 20, n. 3, p. 267-282, 1993. Disponível em: < <Go to ISI>://WOS:A1993LT09000005 >.
- GARROD, B.; WILSON, J. C. Nature on the Edge? Marine Ecotourism in Peripheral Coastal Areas. **Journal of Sustainable Tourism**, v. 12, n. 2, p. 95-120, 2004.
- GARROD, B.; WILSON, J. C.; BRUCE, D. M. **Ecoturismo Marino Genuinamente Sostenible en el Área Atlántica de La UE: Guia de Buenas Prácticas**. Bristol: University of the West of England, 2002. p.
- GHILARDI-LOPES, N. P.; HADEL, V. F.; BERCHEZ, F. **Guia para Educação Ambiental em Costões Rochosos**. Porto Alegre: Artmed, 2012. 200 p.
- HADEL, V. F. Programa de Visitas ao Centro de Biologia Marinha-USP: o monitor na mediação entre a Academia e o grande público. In: PEDRINI, A. G. (Ed.). **Educação ambiental marinha e costeira no Brasil**. Rio de Janeiro: EdUERJ, 2010. p.82-100.

HINTZE, H. C. Ecoturismo na Cultura de Consumo: possibilidade de educação ambiental ou espetáculo? **Revista Brasileira de Ecoturismo**, v. 2, n. 1, p. 57-100, 2008.

JABLONSKI, S.; FILET, M. Coastal management in Brazil – a political riddle. **Ocean & Coastal Management**, v. 51, p. 536-543, 2008.

LUCK, M. Education on marine mammal tours as agent for conservation - but do tourists want to be educated? **Ocean & Coastal Management**, v. 46, n. 9-10, p. 943-956, 2003. Disponível em: < <Go to ISI>://WOS:000187943700008 >.

MADIN, E. M. P.; FENTON, D. M. Environmental Interpretation in the Great Barrier Reef Marine Park: An Assessment of Programme Effectiveness. **Journal of Sustainable Tourism**, v. 12, n. 2, p. 121-137, 2004.

MEIRA, P.; SATO, M. Só os peixes mortos não conseguem nadar contra a natureza. **Revista de Educação Pública**, Cuiabá, v. 14, n. 25, p. 17-31, 2005.

MELO, R. S.; CRISPIM, M. C.; LIMA, E. R. V. O turismo em ambientes recifais: em busca da transição para a sustentabilidade. **Caderno Virtual de Turismo**, v. 5, n. 4, p. 34-42, 2005.

MMA. **Gerência de Biodiversidade Aquática e Recursos Pesqueiros**. Panorama da conservação dos ecossistemas costeiros e marinhos no Brasil. Brasília: MMA/SBF/GBA, 2010. 148 p.

NEIMAN, Z.; RABINOVICI, A. A Educação Ambiental através do ecoturismo; o diferencial das atividades de contato dirigido com a natureza. **Pesquisa em Educação Ambiental**, v. 3, n. 2, p. 77-101, 2008.

OIGMAN-PSZCZOL, S. S.; CREED, J. C. Quantification and Classification of Marine Litter on Beaches along Armação de Búzios, Rio de Janeiro, Brazil. **Journal of Coastal Research**, v. 23, n. 2, p. 421-428, 2007.

OLIVEIRA, M. R.; PITA, C.; GONÇALVES, J. M. S.; LEITE, L.; COSTA, C.; ERZINI, K. Ecotourism Snorkelling Routes at Marinha Beach (Algarve). **Journal of Coastal Research, Special Issue**, v. 61, p. 274-281, 2011.

ORAMS, M. B. The Effectiveness of Environmental Education: Can We Turn Tourists into “Greenies”? **Progress in Tourism and Hospitality Research**, v. 3, p. 295-306, 1997.

PEDRINI, A.; COSTA, E. A.; GHILARDI, N. Percepção ambiental de crianças e pré-adolescentes em vulnerabilidade social para projetos de educação ambiental. **Ciência e Educação**, v. 16, n. 1, p. 163-179, 2010a.

PEDRINI, A. G. Avaliação da educação ambiental no ecoturismo (em trilhas) no Brasil: uma proposta baseada na qualidade conceitual. **OLAM Ciência & Tecnologia**, v. 6, n. 2, p. 83-106, 2006. Disponível em: < [www.olam.com.br](http://www.olam.com.br) >.

PEDRINI, A. G. Ecoturismo, Interpretação e Educação Ambientais, consensuando conceitos. **Anais do VI Congresso Nacional de Ecoturismo**, 2007. Itatiaia. p.15.

PEDRINI, A. G. Trilhas Marinhas no Brasil; uma Síntese para a Educação Ambiental. **Anais do II Congresso Nacional de Planejamento e Manejo de Trilhas**, 2013. Rio de Janeiro (RJ), Brasil. Universidade do Estado do Rio de Janeiro.

PEDRINI, A. G.; BROTTTO, D. S.; LOPES, M. C.; MESSAS, T. P. Gestão de áreas protegidas com educação ambiental emancipatória pelo ecoturismo marinho: a proposta do Projeto Ecoturismar. **OLAM – Ciência & Tecnologia**, v. 10, n. 3, especial, p. 6-81, 2011. Disponível em: < <http://www.periodicos.rc.biblioteca.unesp.br/index.php/olam/index> >.

PEDRINI, A. G.; COSTA, C.; NEWTON, T.; MANESCHY, F. S.; SILVA, V. G.; BERCHEZ, F.; SPELTA, L.; GHILARDI, N. P.; ROBIM, M. J. Efeitos ambientais da visitação turística em áreas protegidas marinhas: estudo de caso na Piscina Natural Marinha, Parque Estadual da Ilha Anchieta, Ubatuba, São Paulo, Brasil. **OLAM – Ciência e Tecnologia**, v. 7, n. 1, p. 678-696, 2007.

PEDRINI, A. G.; MERIANO, D. N. Avaliação da qualidade do ecoturismo terrestre no Brasil: estudo de caso com uma empresa atuante em trilhas, RJ. **Anais do VI Congresso Nacional de Ecoturismo**, 2007. Itatiaia. p.CD de resumos.

PEDRINI, A. G.; MESSAS, T. P.; PEREIRA, E. S.; GHILARDI-LOPES, N. P.; BERCHEZ, F. A. Educação Ambiental pelo Ecoturismo numa trilha marinha no Parque Estadual da Ilha Anchieta, Ubatuba (SP). **Revista Brasileira de Ecoturismo**, v. 3, n. 3, p. 428-459, 2010b.

PIRES, P. S. **Dimensões do ecoturismo**. São Paulo: Senac, 2002. p.

RANGEL, M. O.; PITA, C. B.; GONÇALVES, J. M. S.; OLIVEIRA, F.; COSTA, C.; ERZINI, K. Developing self-guided scuba dive routes in the Algarve (Portugal) and analysing visitors' perceptions. **Marine Policy**, v. 45, p. 194-203, 2014.

REIGOTA, M. **Meio ambiente e representação social**. 7. São Paulo: Cortez, 2007. 87 p.

ROCA, E.; RIERA, C.; VILLARES, M.; FRAGELI, R.; JUNYENT, R. A combined assessment of beach occupancy and public perceptions of beach quality: A case study in the Costa Brava, Spain. **Ocean and Coastal Management**, v. 51, p. 839-846, 2008.

SILVA, J. N.; GHILARDI-LOPES, N. P. Indicators of the impacts of tourism on hard-bottom benthic communities of Ilha do Cardoso State Park (Cananéia) and Sonho Beach (Itanhaém), two southern coastal areas of São Paulo State (Brazil). **Ocean & Coastal Management**, v. 58, p. 1-8, 2012.

TOWNSEND, C. Marine Ecotourism through Education: A Case Study of Divers in the British Virgin Islands. In: GARROD, B. e WILSON, J. C. (Ed.). **Marine Ecotourism; Issues and Experiences**. Clevedon: Channel View Publications, 2003. p.138-154.

VASCONCELOS, F. A. L. D.; AMARAL, F. D.; STEINER, A. Q. Uma visão da classe estudantil sobre ambientes recifais na Região Metropolitana do Recife, Estado de Pernambuco, Brasil. **Arq. Ciên. Mar, Fortaleza**, v. 41, n. 1, p. 104-112, 2008.

WEGNER, E.; TONIOLI, F. C.; CABRAL, D. Q. UnderwaterTrails: a New Possibility of Marine Tourism. **Journal of Coastal Research**, n. SI 39, p. 990 - 993, 2006.

WHYTE, A. V. T. **Guidelines for field studies in Environmental perception**. Paris: MAB Technical Notes, UNESCO, 1977. p.

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