LOCAL PERCEPTIONS TOWARDS BIOLOGICAL CONSERVATION IN THE COMMUNITY OF VILA VELHA, PERNAMBUCO, BRAZIL

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Several human communities in different areas of Brazil are adapted to coastal ecosystems. In the state of Pernambuco, in Northeast Brazil, coastal fishing communities live surrounded predominantly by mangrove vegetation. The mangrove ecosystem is a natural shelter for a large variety of organisms such as crustaceans, mollusks, and several fish species. It is also a reproduction site for many ocean species. The mangrove avoids silting and erosion, and provides nutrients to coastal waters. The trunks of their trees are used in construction and as firewood. Crabs, mussels, fish, and oysters are the main staples of local communities and an important source of revenue (Bastos, 1995).

Attitudes associated to economic usage have altered the environment, damaging the mangroves that sustain the basic needs of population (Blandtt and Glaser, 2000). Brazilian littoral areas are subjected to constraints that provoke degradation due to the increase in urbanization and tourism. This fact results in impacts for resident communities. The destruction of important habitats such as mangroves might cause social disorganization in communities that live on traditional fishery (Hanazaki and Begossi, 2000).

The study of the relationship between human societies and its environment includes economic, social and psychological factors (Begossi, 1993). According to Costa-Neto (1998) cultural and social analyses have not been considered in most discussions about sustainability. However, the present valorization of these factors is seen as a change of paradigm; traditional knowledge has become essential to development. The Earth Summit (UN Conference on Environment and Development, UNCED or simply Rio-92) represents an important landmark in this regard (Costa-Neto, 1998). The need to augment economic and environmental research in tropical coastal areas became evident after several discussions in this conference (Blandtt and Glaser, 2000).

Perceptions and attitudes are influential issues in people's lives because they are able to change their values and thoughts, develop knowledge, improve overall welfare, and change their reality (Del Rio and Oliveira, 1996). A study about these aspects reveals a portrait of the population and of its vision of the world. Therefore, these aspects might be useful in environmental education programs because they help carry out a process of evaluation that identifies the needs in each area for the planning of suitable goals and aims (Cisneros, 1998).

Coastal ecosystems in the state of Pernambuco have undergone several processes that fostered their degradation and decrease in diversity. For example, Barros *et al*. (2000), in an environmental diagnosis of the Santa Cruz Channel, demonstrated the main factors of impact in that locality: predatory fishery, industrial and urban chemical residues, and uncontrolled landfills, that threaten vegetation, contaminate waters and, consequently, affect several organisms, modifying the aquatic environment and causing habitats to disappear. A solution given by these authors is to encourage the local population to become aware of these factors through information and training in order to modify their actions and bring about a new consciousness. This point is relevant because even with a certain degree of perception of environmental problems, communities do not have scientific information about their causes and solutions.

The purpose of this study was to assess local perception towards local environment from an ethic perspective in the small community of Vila Velha, Island of Itamaracá in Northeast Brazil, where there are two environmental protection areas and six natural reserves. Despite the prohibition imposed by the Brazilian Institute of the Environment and of the Renewable Natural Resources (IBAMA), many people use wood as fuel and building material. If different degrees of protection and prohibition in natural reserves

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Figure 1: Study site in Vila Velha village, Itamaracá Island, Pernambuco, Northeast Brazil.

have strong implications for the types of human activities (see for example Diegues, 1996), it was hypothesized that the community would hold negative perceptions toward the adjacent environment. It was also believed that age, time of residence, gender and education level influence the perception of the local people about the ecosystems.

Methods

Study area

Itamaracá Island became a municipality on December 31, 1958. It is located 47.5km from Recife, the capital of the state of Pernambuco (Figure 1), between 07º45'00"N and 34º49'30"W, and can be reached by means of the BR-101 and PE-35 highways. It has an area of 67km², 0.07% of Pernambuco's total area (FIDEM, 2000) and is limited by the towns of Goiana to the north and Igarassu to the south, by the Atlantic Ocean to the east, and by the municipality of Itapissuma to the west. In Itamaracá Island there are two estuarine environment protection areas, six ecological reserves, and one UNESCO-MAB Biosphere Reserve. Thus, it is an area of extreme importance in nature conservation.

According to the Brazilian Institute of Geography and Statistics (IBGE, 1996), the total population in 1996 was of 13799 inhabitants, 11210 urban and 2589 rural. Persons per home averaged 4.6, and by 1999, the population was expected to be 14756. Agriculture is based mainly on the coconut and sugarcane crops. The permanent population lives basically on fishing and subsistence agriculture (FIDEM, 2000).

The island vegetation is of the scrubby type with some Atlantic forest remnants. Coconut trees, considered a subsistence activity along with fishing and tourism, are substituting the old sugarcane crops. The littoral zone has typical shore, mangrove, and *restinga* (in Northeast Brazil a stretch of beach covered by mud) vegetation covering a great part of the Santa Cruz Channel. The species that comprise the region's mangrove (Pinto, 1984) are mainly represented by "mangue vermelho" (red mangrove, *Rhizophora mangle* L.), "mangue de botão" (bud mangrove, *Connocarpus erectus* L.) and "mangue branco" (white mangrove, *Laguncularia racemosa* Gaerth).

Among the activities performed by Vila Velha dwellers are fowl breeding, subsistence fishery, handicrafts, and agriculture. Many people consider themselves self-sufficient because they live on fishery, fowl breeding, and the cultivation of vegetables, roots, and fruit around their homes and plots. These plots are generally smaller than one hectare and generally provided by their owners. Most often the land belongs to a landowner's employee. The neighboring forests, all of them ecological reserves, provide medicinal plants such as "aroeira" (*Schinus terenbithifolius* Raddi), and "cajueiro-roxo" (*Anacardium occidentale* L.). Some fruits are collected in the forest seasonally, as are climbing plants for wickerwork and handicraft.

There are not many employment opportunities in the village and most people work in the neighboring cities. The very few who try to stay in the village struggle for a living in restaurants and handicraft stores; they depend on tourism, the main source of local revenue. Most activities concern coconut cropping, fishery and cooking. Housekeeping and house building are limited activities. There is also an association of small-scale candied fruit producers in the village. Children work on weekends as tourist guides and are called "village guardians" by the local population.

Data collection - interviews

At first, the village was visited three times per week, but in order to have better contact with the community visits in the last phase of the study were more intensive. The principal informant of the village, as indicated by the other residents, was contacted during the preliminary fieldwork. A good rapport and friendship was established that continues to this day. The project goals and the interview format were explained to the local residents, whose approval was sought and obtained. Informants were recruited by going from house to house with the principal informant and writing the names of each person at least 15 years old and interested in participating. Only households with five or more years of residence in the village were chosen and only one person from each house was interviewed. All the interviews to 80 villagers (approximately 20% of the total adult residents) were conducted personally from September to November, 2000. The interviews began with the most elderly, to obtain information on the village's history and habits, and to make the villagers conscious of the purposes of the study. Interviews were performed in the villagers' homes, at the village square and shops, and at any other place where village dwellers willing to yield information could be found.

Three different techniques were employed to obtain information. A standard form adapted from Cisneros (1998) was utilized, which suits the study requirements for qualitative and quantitative exploration of the results. A pre-test was conducted with a small sample of village dwellers indicating the necessity of reformulating the questions of the form. A series of multiple-choice, subjective and affirmative questions in relation to environment conservation were combined. The interviewed person could show a given degree of agreement by an-

swering one of four available alternatives: I agree, I partially agree, I disagree, or I do not know (Table I). Analyses were then performed from information obtained by different means (see questions in Table II).

Statistical analysis

With the answers obtained in the questionnaires a general analysis was performed by calculating the percentage of answers for the statements in the interview. This was another way to note the environmental ideas of the village dwellers and verify the importance given to the surrounding environment. The interview's subjective questions were important to support the discussion. The multiple choice questions in the forms were analyzed by adopting a score; each interviewee could reach 100 as the maximum mark by summing the total of questions. Ten questions were used for this analysis (Table I). The maximum score for each question was 10, when the interviewee answer was considered as conservationist and ideal, according to current scientific points of view. If the answer was conservationist in part, the mark was 5.0. When the interviewee chose an alternative that was negative for the environment or did not know how to answer the question, the mark was 0. From this data the relationship between perception and the degree of perception was analyzed together with the following variables: gender, formal education level, age, and time of residence in Vila Velha. The software Systat 5.0 was used to employ non-parametric tests (Correlation, Kruskal-Wallis and χ^2) for these analyses. Statistical significance was measured at $P<0.05$.

Results

Level of education, time of residence, age, and gender were considered in relation to conservationist ideas. The lack of pronounced differences in the relationship between age range and the average mark obtained for conservationist attitudes can be appreciated in Figure 2. Mean marks for two thirds of the age intervals ranged from 87.5 to 94.20 and included adults, youngsters and the elderly. Higher means were found among individuals from 56 to 60 years of age (94.20) and between 81 and 85 years of age (93.75). People from 71 to 75 and 86 to 91 years of age obtained means of 70.84 and 68.75, respectively. There was no clear association between age and degree of conservationist attitudes ($r= -0.32$, $P<0.05$).

Concerning the time of residence in the village, differences between mean marks obtained and the respective groups were weakly associated ($r= -0.28$, $P<0.05$). Most residence times

TABLE I
ANSWERS OF RESIDENTS OF VILA VELHA VILLAGE, ITAMARACÁ ISLAND, PERNAMBUCO, BRAZIL) TO TEN CONSERVATION AFFIRMATIVES

Affirmatives		N	%
There should be areas with preserved vegetation in every place.	A	67	83.75
	P	5	6.25
	D	7	8.75
	N	1	1.25
The villagers should maintain areas with virgin forest in their properties.	A	69	86.25
	P	3	3.75
	D	8	10
	N	0	0
Biologists and other researchers may help us to solve problems and have a better environment.	A	66	82.5
	P	3	3.75
	D	2	2.5
	N	9	11.25
The forest and the mangrove are of no importance to us.	A	1	1.25
	P	0	0
	D	79	98.75
	N	0	0
It is important to protect the plants and animals of the environment.	A	80	100
	P	0	0
	D	0	0
	N	0	0
The forest and the mangrove are important because of their multiple benefits.	A	79	98.75
	P	0	0
	D	1	1.25
	N	0	0
Wild animals cause only damage and there is no need to protect them.	A	16	20
	P	6	7.5
	D	57	71.25
	N	1	1.25
We have to worry about not bringing down anymore of the forest and the mangrove.	A	76	95
	P	2	2.5
	D	2	2.5
	N	0	0
If the forest and the mangrove disappear. it will not be a problem.	A	1	1.25
	P	0	0
	D	79	98.75
	N	0	0
The forest area should have been shared with the landless people.	A	23	28.75
	P	5	6.25
	D	47	58.75
	N	1	1.25

A: agree; P: partially agree; D: disagree; N: does not know.

TABLE II
ANSWERS BY RESIDENTS FROM VILA VELHA VILLAGE TO THE QUESTION:

a: Do you Like to Live in this Place? Why?		
Answers	N	%
It is calm and peaceful	74	32.03
There is no violence or burglars	58	25.11
Everyone helps each other	33	14.28
There is freedom for the children to play	6	2.60
Here there is no smell of city	1	0.43
I like the field	2	0.86
It is a natural place	2	0.86
Because of the landscape	2	0.86
The sea gives us everything	3	1.30
There is food for all	1	0.43
Fresh air	2	0.86
We have Peace	41	17.75
There is no pollution	2	0.86
There is no traffic	1	0.43
It is shady	1	0.43
Because of the climate	2	0.86
b: Who Should Preserve the Environment on which you Live?		
The government	11	13.25
The villagers	24	28.91
The mayor	3	3.61
The universities	1	1.20
Everyone	12	14.45
I don't know	3	3.61
The navy	1	1.20
The president	1	1.20
IBAMA*	27	32.53
c: In which Point of View Does the Environment Bring Prejudice?		
Makes the access difficult	1	1.18
Brings no prejudice at all	63	74.12
Mosquitoes	6	7.06
Snakes	3	3.53
The mangrove mud	1	1.18
Oysters that cut your feet	1	1.18
It hides the burglars	1	1.18
It's pollution	2	2.35
Bugs	4	4.70
Scorpions	1	1.18
Spiders	1	1.18
Crabs	1	1.18

* Brazilian Institute for the Environment and Natural Renewable Resources

(cont...)

TABLE II (Cont)
ANSWERS BY RESIDENTS FROM VILA VELHA VILLAGE TO THE QUESTION:

d: What Is the Environment Good for?		
Answers	N	%
Wood	17	14.41
Fresh air	6	5.08
Food	23	19.49
For the animals to live	11	9.32
Survey of the people	14	11.86
To sustain the soil	4	3.38
The rains	3	2.54
Oxygen	4	3.38
I don't know	3	2.54
Contact with nature	1	0.85
Shadows	1	0.85
For the egg-laying of fishes and crustacean	2	1.69
To contemplate	2	1.69
Lumber	4	3.38
Fruits	3	2.54
To build houses	11	9.32
Medicine	5	4.24
A better climate	3	2.54
Improves live conditions	1	0.85
e: What Lacks in the Village?		
Better schools and in bigger number	28	15.64
Crèches	12	6.70
Transports	37	20.67
Employment	22	12.29
Pharmacy	8	4.47
A better structured medic post	15	8.38
Supermarket	7	3.91
More roads	9	5.03
Organize the city square	13	7.26
Efficient garbage collection	1	0.56
Bakery	11	6.14
Take out the football field	3	1.67
People working for children's creativity	1	0.56
A local Town Hall	1	0.56
To take good care of the environment	1	0.56
More water	7	3.91
Tourism publicity	1	0.56
Nothing	2	1.12

corresponded to averages between 87.5 and 95.31 (Figure 3); the two intervals with the highest marks are distributed on opposite sides of the graph: people with up to 5 years of residence obtained a mean mark of 93.75, while the interval that encompasses dwellers living in the community between 51 and 55 years, obtained a mean of 95.31. The correlation analysis seems to reinforce the fact that there is no influence of the time of residence on the degree of conservationist ideas. Three groups (36-40, 61-65, and 66-70 years of residence) had means lower than average (77.68 for the first and 75 for the other two). The interval with dwellers with 56 to 60 years of residence included only one person with a score mark of 50.

An increasing relationship is verified between the score mark averages and the group's education level (Figure 4). Individuals who had never gone to school reached a mean mark of 82.39, while those who considered themselves literate but did not study obtained a mean of 85.23. Those educated up to primary school reached a mean of 87.42 and those who stopped studying or were in the secondary school reached a mean of 91.80. University graduates or postgraduates reached a mean of 92.50. The differences for the various educational levels were not significant ($H=7.61$; $p>0.05$), which indicates that the marks reached by each group are independent of formal knowledge.

When gender was considered, no relationship was found between the degree of conservationist ideas and the differences in the marks reached by men (average of 87.71) and women (average of 87.23), which were not significant ($\chi^2= 0.28$; $p>0.05$).

A methodology used in order to assess dweller's perceptions was that of interviews using affirmative statements. A total of ten affirmative questions were used. Most results were represented by conservationist answers (Table I) since a larger number of respondents chose the most coherent question from a conservationist point of view for all the statements given ($\chi^2= 158.5$; $p<0.001$). When faced with the statement that the vegetation should be preserved everywhere, 83.75% of the respondents indicated agreement and mentioned the importance of the forest for village health, water conservation, and pure air. Only five dwellers partially agreed and seven disagreed. "Everywhere" referred to places in which it would be possible for vegetation to occupy.

Most respondents (86.25%) think that it is necessary to conserve areas with forests in their proprieties. Village dwellers claimed that the climate was much better when there was a forest nearby. There were some complaints about the heat in larger cities as an argument to support this necessity. When people were asked about the role of biologists and researchers in the solution of problems and in environmental improvement, 82.5% thought that they must have some importance.

Concerning the importance of mangroves, 98.75% (79 persons) disagreed with the statement: "forest and mangroves are not important for you". Many interviewees fish everyday, others once a week, and some have fished for several years. Everyone agreed that animals and plants should be protected in the environment. Only one village dweller disagreed with "the mangrove and the forest are important because they generate many benefits". By interviewing the village dwellers, the knowledge of part of the community was analyzed due to the fact that the mangrove is a place used by fish, mollusks, and crustaceans to reproduce and to live in. It is believed that without the mangrove Vila Velha would not exist.

A total of 71.25% of the interviewees disagreed with the fact that wild animals only cause damage and that it is not important to preserve them. These people also indicated that there is no danger if we do not invade their territory. Perhaps some people (20%) agreed with the statement because even after the explanation they continued to think that "wild ani-

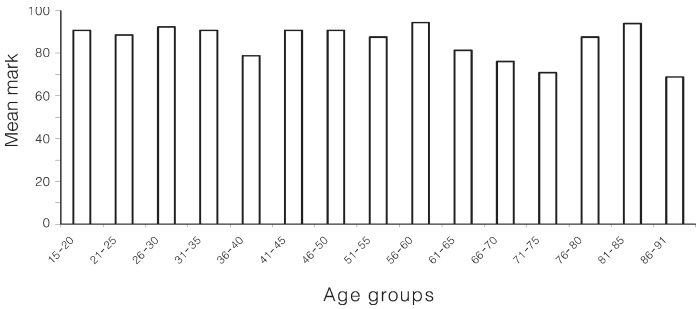

Figure 2: Relation between age groups and conservationist ideas of the interviewed people in Vila Velha village, Itamaracá Island, Pernambuco, Brazil.

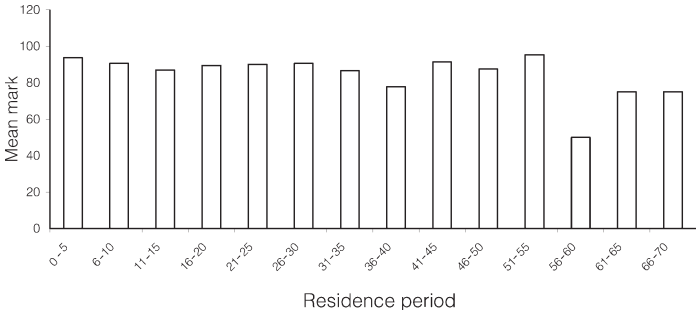

Figure 3: Relation between residence time and conservationist ideas of the interviewed people in Vila Velha village.

mals" are only jaguars and lions (which may hurt human beings) and did not know the animals in their environment. Six people partially agreed; from these, some pointed out the importance of certain wild animals and that it is not necessary to keep them alive because they must be kept far away from humans.

Only four interviewees considered the concern about deforestation as irrelevant since in the village many people take wood for house building and do not support IBAMA's prohibition. It is said that those resources have always been used and there has been no problem so far. The majority believe that the rational use of resources is the solution. Only one interviewee agreed that if the forest and the mangrove disappeared there would be no problem.

More than half of those interviewed (47) believe that it is unnecessary to destroy the forest to supply those who do not have land to cultivate. Many claimed that there are several areas for this purpose around the village. Five informants partially agreed with deforestation in favor of agricultural development for those in need. Meanwhile, 28.75% believe that this is an interesting alternative when landless people are unknown or even when the importance of the forest is not recognized.

The majority of the informants (Table IIa) appreciate living in the village due to its calmness and tranquility (32.03% of the answers). Violence and delinquency were other aspects mentioned as being significant (25.11% of the answers), as they influence the tranquility of the place. Many claimed dwellers are united and help each other. Some still have the idea that everybody is a family. A total of 41 persons (17.75%) mentioned peace as essential to their lives. This point is part of their search for a calm and tranquil place to live in and intervenes in their environmental perception and positive attitudes.

Regarding the responsibility for environmental preservation, an interesting result (Table IIb) was that 32.53% of the answers affirmed that environment conservation where they live is IBAMA's responsibility. In addition, there were many conservationist ideas (28.91%) that attributed this responsibility to the population. Moreover, some people (14.45%) agreed that this fact should be amply discussed, even with authorities and visitors. Some responded that the government, the town hall, or the president should be responsible. The Navy, which took care of the area in the past, as well as universities, were also cited. Three persons did not know how to answer the question.

Concerning prejudices in relation to the environment some respondents, mainly women, showed disgust for snakes (3.53%), insects (1.18%), scorpions (1.18%) and crabs (1.18%) (Table IIc). Some people do not seem to know that these animals are harmless to man when undisturbed. Mosquitoes were a reason for annoyance for six of the informants (7.06%). Other elements of damage such as mud, pollution, vegetation (due to the cover it provides to thieves and difficulties of access), and oysters (for cutting people's feet) were also mentioned. Some answers were not satisfactory from a conservationist point of view. Some people considered the natural aspects of the mangrove as a dirty environment (referred to in the answers as polluted).

The usefulness of the environment was mentioned, for obtaining food and for survival for 19.49% and 11.86% of the answers, respectively (Table IId). The environment as a home for several animal species (9.32%), for taking wood (14.41%) and for constructing residences (9.32%) was also reported. There were some positive answers such as improving the climate (2.54%), for spawning and raising marine organisms (1.69%), to sustain the soil (3.38%), and for popular medicine (4.24%).

The majority of the interviewees (Table IIe) indicated that the village lacks transportation (20.67%), better and more schools (15.64%), and jobs (12.29%). They also claimed the need for crèches, drugstores, supermarkets, and better medical assistance. There were two dwellers that did not vindicate anything, yet did not deny that it would be important to have a bakery, for example.

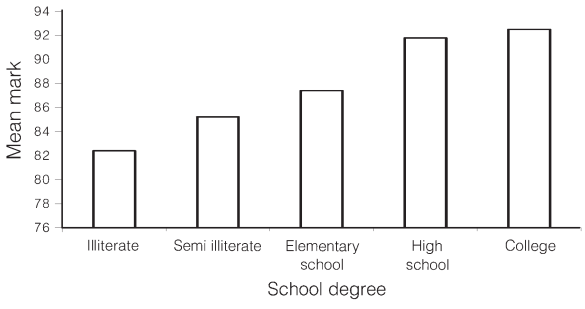

Figure 4: Relation between school degree and conservationist ideas of the interviewed people in Vila Velha village.

Discussion

As reported by Cisneros (1998), in a study of environmental perception in Mexico there was a positive relationship between the education level and answers favorable to the existence of a biological reserve. This factor influenced attitudes, as did geographical aspects such as the place, a reserve, where people lived in. In the present study, no significant relations were found between these variables and positive perception toward the environment.

The educational level may influence local perception. Heinen (1993) reported a positive correlation between level of education and conservationist attitudes regarding the existence of an ecological reserve. Influences of age, time of residence and education level on attitudes and perceptions were observed by Fiallo and Jacobson (1995). In this study, no significant relationship among these factors was found**.** For example, considering age intervals, some elderly dwellers did not obtain good marks, and this was also observed for younger groups. Meanwhile, these results might have been generated by lack of formal education and information and, in the case of the elderly, due to the isolation from conservationist ideas. Many of the youngsters were raised without fishing experience or were not even aware of the activities that link man to the environment (see El-Deir, 1999). They have the idea that modernity is linked solely to urban areas and do not see the importance of diverse ecosystems nor are acquainted with the concept of sustainability.

The present results showed that local people generally have positive perceptions. People who live in the village have several positive attitudes in relation to the environment, such as collecting only fallen wood and avoiding hunting wild animals that live in the forest around the village.

The results concerning the profile of Vila Velha dwellers are coherent to those reported by Lombardo and Martins (2000) and El-Deir (1999). They observed a positive perception among informants that appeared to be involved in the village garbage problem. According to these authors, village dwellers reject vending stalls. Several people interviewed in this study remarked about the need for a better organization of the village square due to the fact that many stalls are spread around the free space. Village dwellers were concerned about the mangrove and forest in the affirmative questions, and recognize the mangrove's importance. Tuan (1980) explained that the usage of and respect for the environment may come from tradition, as well as from the direct contact of the population with the environment. On the other hand, it was verified that people who did not perform any activity directly related to the environment also possess a certain degree of respect for it. Tuan (1980) claimed that direct contact is a determinant aspect of environmental perception.

Del Rio and Oliveira (1996) considered that one's perception implies the reality in the acquisition of knowledge and personal values. Each person sees the world in a particular way. In the visual sense, many people have advantage over others, such as those that need to use glasses, as exemplified by Tuan (1980). He showed that sensitivity and skills play a fundamental role in the aspects upon which people fix themselves to in their perceptions. In this sense, the interviewees showed a strong topophily in relation to the environment. Topophily is a term created by Tuan (1980) that signifies the set of links between the individual or group and the environment, which may be triggered by simple visual pleasure and physical contact with the environment. In addition, this author related health and familiarity with the concept of topophily, and cited several poets to conclude that, for a complete sensation of well being, there should be a good relationship between man and his surrounding environment; familiarity being treated as an important feeling for the place. People's past, when reported, moves the descendants.

Several authors have pointed out the role of local populations in development policies. Albuquerque (1999a, b) supports the idea that traditional management of natural resources has different alternatives for environment usage and development, and believes that traditional knowledge might guide studies to promote sustainable management systems in tropical ecosystems, highlighting that it is not possible to separately discuss cultural and biological questions in the development of environment policies. In this way, it is important to undertake studies on environment perception. Perception is one's own experience in an environment, it is information obtained through the senses, the media, and through contact with other people. Attitudes might be considered as affective responses to an object, a person or an affective domain and are also influenced by knowledge and moral values (Cisneros, 1998).

Currently the unwanted occupation of a number of ecosystems has been increasing, especially in coastal areas, which are losing their natural features as well as a significant part of their biota. These ecosystems have been turning into deposits and passages for chemical remnants, sewage, and other pollutants. All this is caused by the disorganized growth of coastal communities along with industrial expansion and predatory tourism (Diegues, 1996). This author mentions the country's historical tradition in occupying littoral areas and suggests that different alternatives for resource usage, aiming at sustainable development must be implemented for successful coastal management, and also explains that coastal management is based on the existence of complementary, conflicting, or mutually excluding usage of ecosystems.

In conclusion, the implementation of appropriate long-term educational programs targeting the local people in Itamaracá Island is necessary, considering their values as well as positive and negative attitudes towards the environment in the several activities performed by them. The study also reports what the community thinks of the village and their natural surroundings, which in a larger scale reflects a positive exchange between human beings and their environment. With respect to the importance of perception studies, Burke (2001) argues that "perceptions can influence collective strategies of resource use". In the specific case of common resources he advocates that "perception should be integrated into the analysis of common resources uses... to better understand how resource users perceive their resource use and resulting degradation".

This study shows that the knowledge of the local population, their tradition, and their social, ecological, religious, and human values must be taken into account by any environmental management or education projects (see Berkes, 1999). Human beings are the key actors in maintaining environmental equilibrium. On the other hand, they are also great predators due to their inherent will to change natural conditions. Yet their knowledge, when accumulated, reproduced, and disseminated, has the potential to transform without degrading and bringing about harmony with nature.

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