

Tourism and Environmental Education in the Mayan Riviera at the Beginning of the Twenty First Century

Lilia Susana Padilla y Sotelo*, Arun Kumar Acharya**, Ana Maria Luna Moliner***
and Pablo Bayón Martínez***

**Instituto de Geografía, UNAM, Av Universidad 2000*

Circuito Exterior, Ciudad Universitaria. Col Copilco el Alto. México, 02450 DF.

Telephone: 56-22-43-30, Fax: 56-16-05-39, e.mail: lisupa@yahoo.com

***Instituto de Investigaciones Sociales, Universidad Autónoma de Nuevo León, Monterrey, Mexico.*

****Instituto de Filosofía, Ministerio de Ciencia, Tecnología y Medio Ambiente, Cuba*

KEYWORDS Environmental Tourism Education. Conservation. Environmental Issues. Sustainable Development. Mayan Riviera

ABSTRACT The paper presents an overview on the development of tourism in the Mexican Caribbean from its origins as the "Cancun's Integrally Planned Nucleus" and its extension along the Mayan Riviera, showing analogies between theoretical geographical models of the Caribbean destinations and the spatial structures present there, explaining the urgent need for environmental education of the population linked with sustainability of the development. An analysis of the general education levels of the population reveals the baselines to develop an awareness process of environmental education. The application of polls allowed an understanding of the social interaction with their environment, and their environmental perception linked to attitude and the actively participating in the territory's development. Conclusions about the relations of social practices as the origin of macro-spatial structures in the corridor, along with the possibilities of improve changes in habits and attitudes through environmental education of those involved in the Mayan Riviera's tourism development at the beginning of the twenty first century.

INTRODUCTION

The Mayan Riviera is the southern most part of the Mexico, which includes the states of Quintana Roo and the Yucatan Peninsula. Until the middle of the twentieth century, the region's economy was dominated by the rubber cultivation, copra, and wood plantations along with exports of raw materials and sea products through its coastline. But, during the last three decades (since 1970), there is a profound changes altered in the entire region derived to a great extent from the economic success of Cancun's Tourism Nucleus¹, a core of Caribbean tourism ever since. Nevertheless, this *sectorial* development has given rise to social and environmental issues² which is threatening the sustainability of tourism development. Since 1994, top-classes hotel infrastructures are growing up along the coastal area located in south of this nucleus, known as the Mayan Riviera and the rest of the state's Caribbean coast, such as from Punta Herrero to

the Great Bay of Chetumal, is in the process of development, denominated as the Mayan Coast (Dachary 1997).

In general, in spite of being a very fragile area with limited sand dunes, mangroves and reefs, Quintana Roo's coast is taken into consideration under the Mexico's National Development Plan 2001-2006, which includes *sectorial* programs and special plans such as the Panama-Puebla Plan³ for its development. Because of its scope, latter involves large-scale economic and social aspects, aiming to coordinate national development interests along with supranational aspects (Manchuca 2000).

Therefore, Mexico's Caribbean tourism development is one way towards integration⁴ through its opening to the world market, becoming considered among the "*leisure peripheries*"⁵ generated by the demand from the world political centers and economic power.

LOCATION AND GEOGRAPHIC OVERVIEW

Geologically, the Yucatan Peninsula is constituted by calcareous materials, locally known as *Saskab* (lime stone)⁶, a material that allows the formation of underwater river beds when rainwater infiltrates through it under tropical

For correspondence:

Rangaiah Babu, Senior Lecturer
Department of Psychology, Maharaja's College,
University of Mysore, Mysore 570 005, Karnataka, India
Telephone: +91- 9449408406/9886438406
E-mail: ranga.b@rediffmail.com

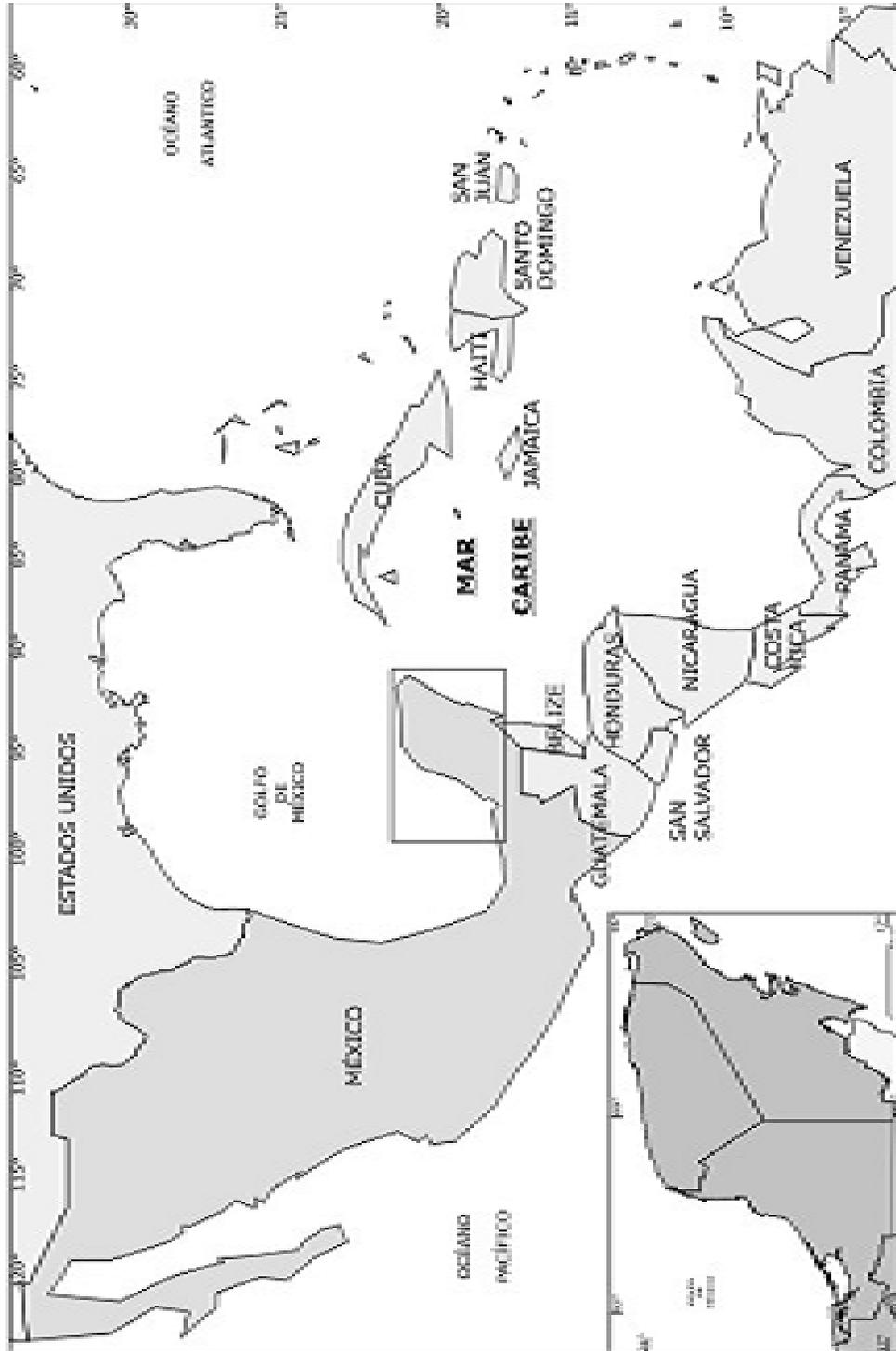


Fig. 1. Geographical situation of the Peninsula de Yucatan in the Caribbean

conditions, resulting in a system of structures typified by “*Cenotes*” (deep round-edged water reservoirs with vertical limestone walls)⁷, puddles and small lagoons⁸. The topography hardly reaches to 30 meters. With respect to the climate, the mean annual temperature in the region is 25.5° C, fluctuating from 5 to 7 degrees. Located within the inter-tropical convergence area, the mean monthly temperatures never drop below 18°C⁹. The annual pluvial precipitation ranges from 1100 to 1500 mm; the climatic diversity is most evident during summer and winter.

The State of Quintana Roo, where the Mayan Riviera is located, adjoins the States of Yucatan

and Campeche and shares a bi-national border with Guatemala and Belize (Fig. 1); the Mayan Riviera corridor is located on its eastern coast, partially comprising the municipalities of Benito Juárez, Solidaridad and Felipe Carrillo Puerto (Fig. 2), approximately 30 km south of Cancun’s airport and extends for more than 100 km to Tulum’s archeological area and ending in Punta Allen, a fishing town within the Sian Kaan’s biosphere reserve¹⁰. The Riviera includes semi-urban villages of various sizes, such as: Puerto Morelos, Playa del Carmen¹¹, Xpu Ha, Akumal, Xel-Ha, and Tulum (Fig. 3).

Cozumel Island is located in front of Playa

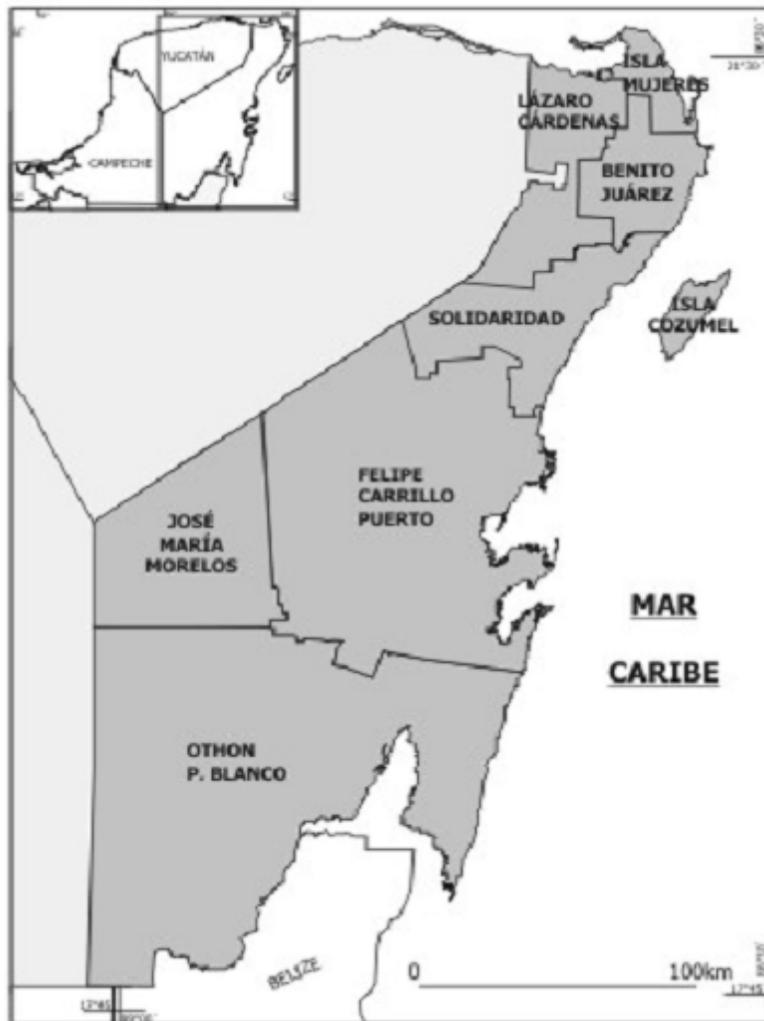


Fig. 2. The State of Quintana Roo in the Penninsula of Yucatan

del Carmen, visited by numerous tourism cruisers every year during their trips across the Caribbean. Tourism, which at first was conceived as a *sectorial* development in the seventies, should be perceived today as the driver of integrated development in the area, with a permanent dynamics that generates job opportunities as well as economic and social progress for its inhabitants. At the threshold of the twenty first century a new paradigm emerges for development,

the non-absoluteness of economic achievements, and the consideration of social, political and environmental aspects.

NATURAL RESOURCES: BASIS FOR TOURISM DEVELOPMENT

The amount of natural resources in the Mayan Riviera for recreation purposes is significant. The above mentioned corridor includes attractive



Fig. 3. The Riviera Maya in the state of Quintana Roo

landscapes, humid coastal areas, sandy dunes, barrier and fringing reefs, which shelter abundant marine vegetation and the typical Caribbean fauna.

The terrestrial biotic components are evident as mid- and low-stature rainforests, wetland vegetation, poplars and eight types of mangroves, the latter being the habitat of a distinctive fauna. In rainforests, spider- and howling monkeys, crocodiles in flooded mangroves and numerous species of invertebrates and insects are interrelated within the tropic chains of these ecosystems. In the sea, the very important coral reefs constitute the primary biogenetic source of limestone, which contribute material to sandy beaches, and the habitat for coral-reef fauna. Ecological studies have identified the existence of 49 animal species on the brink of extinction in the area; however, the possibility of achieving a sustainable tourism development based on conservation measures and adequate planning cannot be discarded¹².

The landscape of the Caribbean are enriched by the *carsic* geo-morphology of the limestone platform of marine origin; lagoons, caverns, underground rivers and *cenotes* converge in a mosaic of attractions which give landscape its singular nature, because of its biodiversity and susceptibility in places such as Playa del Secreto, Playa Paraíso, Punta Maroma, Punta Bete, Xcalacoco, Playa del Carmen, Xcaret, Calica, Paamul, Puerto Aventuras, Xpu Há, Kantenhah, Akumal, Xel Há, Tulum, Cobá, Boca Paila and Punta Allen (Capurro and Herrera 2002).

It is important to conceive that the Mayan Riviera's resources are not only as potential materials for leisure tourism but also as means for

the endogenous development in a joint multiple vision of local and supranational interests. It is worth to mentioning that approximately 25 percent of the geographic space in the state of Quintana Roo which extends to 50 844 km², including the main islands of Cozumel, Isla Mujeres, Holbox, Isla Blanca and Contoy, have some kind of ecological protection, aimed at preserving the geo-diversity resources. Locations assigned a "protected" category as shown in table 1.

Moreover, fifty one percent of Quintana Roo's territory is covered by forests, 34 percent is devoted to production and only 15 percent is dedicated to other uses, including tourist infrastructures. This gives an idea about the abundance of natural resources in the territory with potential for "ecotourism". Local inhabitants contribute to diversify, even more, the tourism potentials of the Mayan Riviera with cultural and archaeological resources.

The infrastructure of large luxurious resorts, with all the appropriate facilities for international tourism, is not an obstacle for the coexistence of small cottages built between the forest and the sea, conceived as an optional element within the lodging diversity offering contact with nature, perception and contemplation of the surrounding natural values. The gastronomy of the Mayan traditions is also part of the cultural attraction, with natural ingredients native to the area, numerous restaurants of varying categories, with modalities of international and Mexican cuisine.

With regards to Mexican tourism, at the beginning of the twenty first century Quintana Roo accommodates over three and a half million tourists annually (Propin and Sánchez-Crispín 2002), surpassed by other tourist centers like

Table 1: Protected areas in the state of Quintana Roo.

<i>Protective Category</i>	<i>Localities</i>
Wildlife protection area	Uaymil
Biosphere reserve	Sian Ka'An
Biosphere reserve	Chinchorro Bank
Special biosphere reserve	Contoy Island
National Park	Tulum
National Marine Park	Cozumel Reefs
National Marine Park	Western coast of Isla Mujeres, Punta Cancún and Nizuc
Biodiversity assessment and monitoring unit	San Felipe Bacalar
Urban Park	Kabah
Natural Park	Chankanaab Lagoon
Terrestrial and marine wildlife protection area	Colombia Lagoon
Area subject to ecological conservation	Manatee Sanctuary in the Bay of Chetumal
Reserve	U Yumil C'Eh (The land of the Lord of the Deer)
Private reserve	El Edén

Source: elaborated by the authors with data from <http://www.quintanaroo.gob.mx>

Mexico City, Veracruz and Jalisco. It is necessary to refer to theoretical indicators to visualize the magnitude of the tourism industry of this state. Based on official information from the Ministry of Tourism (SECTUR in *Spanish*) Sánchez-Crispín¹³ found that in the year 2001 the tourism intensity index¹⁴ for the state of Quintana Roo was 302.7, which was the highest in the country followed by Baja California Sur with 126, which gives an idea of the infrastructure availability.

According to the above author, the highest tourism penetration index to the above mentioned state, based on the relationship between the number of tourists and inhabitants (5,6 visitors/inhabitant). This figure represents a standard deviation close to 5 in the series of this indicator for the whole Mexico. As a weighing element, the state that follows, Baja California Sur¹⁵, shows a penetration index of 1.7; which gives an idea of the potential impact that tourism has on Quintana Roo's society in the adoption of external cultural patterns. The degree of internationalization, measuring the weight of foreign tourism as a proportion of total visitors, is the highest of all the Mexican states with a value of 74.4.

THE MAYAN RIVIERA A SPECIFIC EVIDENCE OF GENERAL THEORETICAL MODELS

The interpretation of socioeconomic peculiarities present in the Mayan Riviera, the understanding and explanation of them from a geographical standpoint, requires the perception of the multiple and complex interactions that coexist in the spatial context. General features of the spatial process fixed by Weaver (1993) in other areas of the Caribbean region are evident here, with tourism having restructured the economies, replacing plantations and modifying the space. Cancun is considered as an inductor nucleus of a lineal model of tourism development in one segment of Mexico's Caribbean coasts. Due to its exponential growth, today tourism reshapes spaces in the Caribbean zone, both in the peninsula and in the islands. These are signs of an ever-increasing globalization process, of the competitive aspect of capitalism in the present stage, and of the geopolitical nature of strategic resources and geographical locations (Luna 1992).

In the social aspect, the imbalance, the breach between the consumer patterns of those who

coexist in the tourist space, whether that may be guests or hosts, becomes evident in the comparison, devaluating in most cases the identity and culture of the latter. This occurs despite the fact that at the moment of "conception" of the *sectorial* development project, the indigenous cultural features of each "place" compete with each other within the diverse Caribbean.

Initially, projects were not conceived in terms of a systemic harmonized development, managers did not speak in terms of sustainability, but rather of *sectorial* development "nuclei" that should function as "drivers of regional development", made by and for tourism promotion, for the smokeless although not waste less industry¹⁶. Thus, the question of social and ecological deterioration emerges, fostered by exogenous interests. It is necessary to assume that an indigenous model aimed to achieve harmonious and fair human progress, based on respect for nature. Nowadays, it is impossible to talk of a sectorial development without raising questions about the natural and cultural resources. The objective of the new developments is not focused exclusively on economic success, but also on social progress with satisfactory political and ecological links¹⁷.

The urgency to change and multiply the subjects and scales of development, without losing sight of national strategies, attempts to give human development a top priority from sectorial development based on local resources in each bio-region. Failure to achieve harmony among social, economic and ecological systems threatens the success¹⁸ of the entire geo-system, jeopardizing its sustainability. Policies must democratize the environmental management arena, from the general national levels to the local frame of actions necessary for the care and preservation¹⁹ of its natural resources. However, this requires to develop the awareness of individuals and groups that constitute civil society. (Luna and Nodarse 2001), whose practical activity is related with the creation of socioeconomic spaces (macro-structures) as well as with the psychosocial field of attitudes, habits and beliefs which mediate in the environmental rationality.

The objective of the complex process of environmental education is to promote harmony among the individuals and groups that make up society and their activity with the surroundings; to foster the participation of those who until now are relegated to a passive role or of those

“assimilated” by a vertical *sectorial* development within their space, from the resources of their patrimony. The goal is to incorporate them to the local and regional development, integrating them to the territory’s development preserving at the same time their identity and natural patrimony, and incorporating their traditional products and their direct or indirect services to the tourism sector (Luna 1992).

In order to address the necessary relationship between tourism and environmental education in the Mayan Riviera at the beginning of the twenty first century the existence of two theoretical premises are essential:

1. On a large-scale structural geographical scale, a spatial pattern of tourism development has emerged from the 70s, that essentially responds to the spatial characteristics of Caribbean tourism and the economic success of which requires to consider the remaining ecological and social aspects involved in sustainable development as conceived at the beginning of the twenty first century²⁰.
2. On a micro-social scale, environmental education is required²¹ as an instrument of the attitude change and necessary for the harmonious sustainable development of the ecological and social systems in the Mayan Riviera.

ENVIRONMENTAL EDUCATION: IMPROVING PARTICIPATION

Environmental education is a process which characteristics depend on the context, and even when it has general objectives, peculiarities can be appreciated according to the specific place where it is carried out. As education process promoting awareness in relation to ecological and socio-cultural problems, as well as preventive actions in the surroundings, it communicates values and develops abilities for the identification of environmental issues among the members of the community, citizen and school perspective (Novo 1996).

Education contribute to promote values related to cultural identity, ethics, aesthetics, hygiene and respect towards nature; ensure the knowledge of local history and its traditions, encourage the protection of natural and social resources; contribute to the knowledge on global, national and local problems of the natural environment, develop abilities, attitudes, aptitudes, awareness and individual and collective

responsibility to protect the environment²², which opens the individual possibility to participate in the development and configuration on the space.

An interesting approximation within this context is given by Smith-Sebasto (1997), who expresses: “the objective of environmental education is to provide individuals with opportunities to develop abilities to investigate and evaluate information”. This statement, which seems pragmatic, is pertinent if accepted as background, that the local individuals bear their ancestors moral values, making them able to understand the harmonious existence between humans and nature and the existence of their own knowledge regarding production technologies allowing to survive in a natural environment.

There are elements that restrain a clear vision of the required terms for environmental education, these vary with the diversity of environmental problems; with the scale -from local to global levels- and becomes even more complex by the enormous variety of recipients with different levels of indirect and direct implications on environmental quality, from scholars to decision makers, from tourists visiting natural areas to the local community, to the different socio-cultural perceptions of the environment (Bayón 2002).

The various conceptions, focal points, methodological tools, and even different resources must be cause-based, from those centered more in the environment, others directed towards commitment and social action. Thus, the need to present theoretical positions allowing to judge the historic and socio-cultural reality in the Mayan Riviera.

A stable broad-focused development on environmental education in the Mayan Riviera will require findings and interchanges regarding this management instrument in a concerted way; it will require coordination between programs from various institutions and social organizations; and the effective implementation of actions. To this respect a regional education and training center for sustainable development could organize, promote, support and coordinate activities and programs of environmental education and training²³. Likewise, it should be based on basic and applied research projects and programs, and in the exchange and discussion of the results obtained.

Any environmental educational proposal should involve a social focus, given the fundamental role that individuals and social

systems have in relation to environmental issues and potential solutions. From this perspective, the poll (see annex) helped to identify the social groups involved in the day to day practices in the area, as a first contribution for future environmental educational work proposals in line with the Ministry of the Environment and Natural Resources (SEMARNAT *in Spanish*) for its Community Centers of Environmental Knowledge and Information through the Education and Training Center for Sustainable Development (CECADESU *in Spanish*).

THE POPULATION: IMMIGRATION AND REGIONAL IDENTITY AT THE MAYAN RIVIERA

The population of Quintana Roo has a differential growth during the last 50 years, in response to historical - political events. According to official numbers (INEGI, 1992), the growth rate has increased from 1960, registering an annual average rate of 5.8% in the following 10 years; later, when tourism projects in the northern area of the state were implemented, the population grow rapidly with a rate 8.66% from 1970 to 2000, caused by immigration from other states (Navarro et al. 1992). The analysis of the mean annual growth rate in each of the censuses, was 9.87%, 8.12% and 5.96% during the periods of 1970-1980, 1980-1990, 1990-2000, respectively (Table 2).

Quintana Roo has become a place of attraction for immigrants from all around the country. The higher proportion of population is concentrated in the north part of the state, basically in two cities: Cancun in Benito Juarez

Table 2: Population growth by gender in Quintana Roo between 1960-2000.

Year	Men	Women	Total
1960	26,594	23,575	50 169
1970	45,714	42,436	88 150
1980	116,360	109,695	225 985
1990	254,908	238,369	493 277
2000	448,308	426 655	874,963

Source: INEGI(2001) Historical Statistics of Mexico.

municipality; the other, recently developed, is Playa del Carmen in the Solidaridad municipality. This both cities have become immigration centers offering tourism-related job opportunities. The other part of the Quintana Roo’s territory currently known as the Mayan Riviera was an important and religious center for ancient Mayans. The urban center Tulum, a fortress facing the Caribbean sea, is the most impressive archaeological site that has survived up to present day, although other important towns existed such as Xaman-Há (actually Playa del Carmen), Xcaret (known as Puerto de Pole by the Mayans) and Xel Há, the first European village in this region.

It is worth mentioning that while the population living along the coast of Quintana Roo has undergone a marked growth, the population in the rest of the state has grown at a much slower pace, (Fig. 4); if the current growth rate continues as during the last period, there will be more people living in coastal areas than in the rest of the state in the future (Mendoza 1998).

The above discussion is a clear evidence that the population has expectations of a better standard of living in coastal areas given the increase in tourism, a situation reflected in the population distribution by municipalities: in 1970,

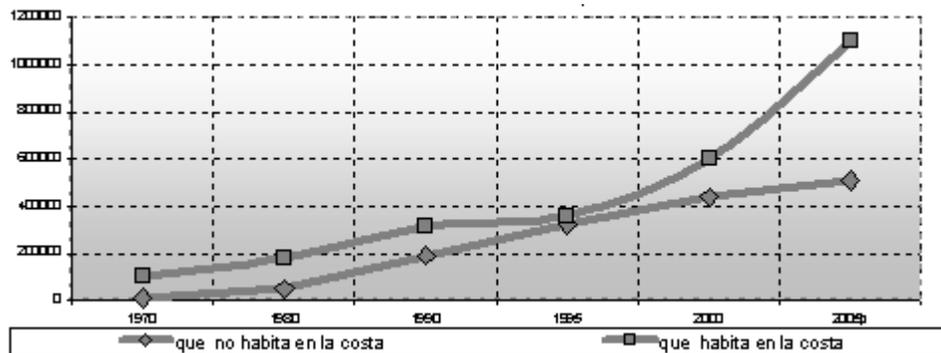


Fig. 4. Comparative of population's growth that inhabits in the coast de quintana roo, 1970-2005
 P=Projection
 Source: (<http://www.santuariocxcel.uqroo.mx/santuariocxcel/capi3-3.html>). Source: INEGI, 2001

the 41.23% of the state's population resided in Othón P. Blanco; 36.66% lived in Felipe Carrillo Puerto and the rest of the population was scattered in the remaining municipalities; Solidaridad did not exist. In the 70's a population redistribution began, in 1980 the Othón P. Blanco municipality comprised 43.37% of the state's population, in 1990 this indicator dropped to 34.98% and by 2000 to 28.72%, this same trend was observed in the municipalities of Felipe C. Puerto, José María Morelos and Lázaro Cárdenas, whereas in the Benito Juárez municipality (where Cancun is located) these indicators were 16.46%, 35.83% and 44.30% for 1980, 1990 and 2000 respectively, illustrating the attraction that the coast exerts²⁴.

The Solidaridad municipality is especially an important tourist center in the Mayan Riviera. The municipality created on July 27, 1993, it is the region where X'cacel-X'cacelito is located, decreed as a natural protected area and in the northern part of the municipality the city of Playa del Carmen is situated which is a core tourist village of the municipality. In 1980 there were only 737 inhabitants (INEGI, 1985), growing to 3,098 in 1990 (INEGI 1992), and by the year 2000 was 43,613 (INEGI, 2001)²⁵. It is important to mention that in 1995 the mean annual growth registered at 41.58%, the highest in the country²⁶. There are other important population centers in the Mayan Riviera such as Tulum (6 773 inhabitants) and Akumal (1 088 inhabitants) (Fig. 5).

The state of Quintana Roo ranks tenth in relation to the absolute number of native inhabitants in the country. The dialect-speaking population is Mayan, a vital factor in the identity of the peninsular population. By the year 2000 the Mayan population grew to 150,454 persons, with men (80,229) prevailing over women (70,225). Ninety two point seven percent of the indigenous population older than 5 years regarded themselves as bilingual.

The data indicates that the monolingual population (Spanish origin and Spanish speaking) is concentrated in the central part of the state of Quintana Roo, where indigenous communities are more traditional. In contrast, the population inhabiting the northern and coastal part of the state are currently facing an identity reformulation and an aculturization process, due to influence exerted by urbanization and tourism. The aculturization trend is most evident among indigenous immigrants inserted in the formal labor force and within non-indigenous social

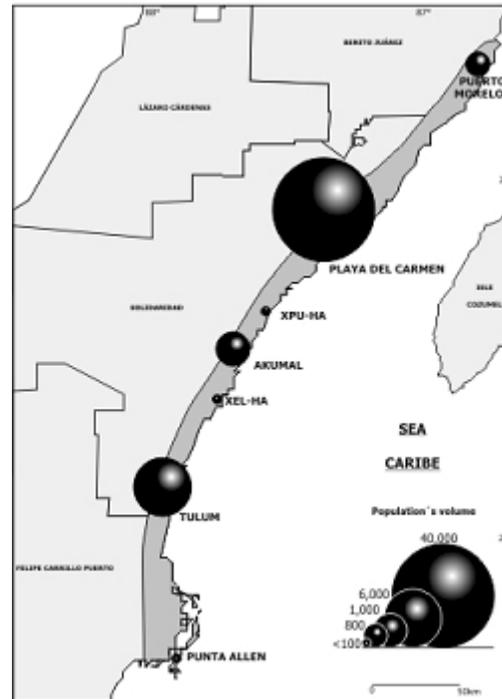


Fig. 5. Population's volume in main towns

structures, becoming uprooted from their communities of origin. In this population segment the loss of cultural essence which can be seen from their use of their dialect, their costumes and their ritual practices²⁷. So, in relation with the above, the environmental education as a participation process could have an important impact in the preservation of the practices through which indigenous communities express their identity and singularity and their relationship with the natural environment.

EDUCATIONAL LEVELS OF THE POPULATION: A BASIS FOR THE ENVIRONMENTAL EDUCATION

Quintana Roo's educational system includes from preschool to college studies. The illiteracy index is 7.6%. By the year 2000, the fundamental challenge in this state was to rise the quality of education without overlooking equity, focusing attention towards addressing the local demand as the population aged 5 years and more didn't have primary education facility. For example, during this period only 8.1% population didn't

have basic education that to say primary uncompleted and 17.1% had the primary complete education, 28.0% had junior high school study, 19.1% had senior high studies and 9% had college studies (Fig. 6 and Table 3).

The Human Development Index (HDI) is used to apply to measure the quality of life based on the indicators such as: life expectancy at birth, educational achievements (adult literacy and the combined registration of primary school, high school and college education). So, if we taken into consideration all the variables for Quintana Roo, the state remain in the ranks 9th out of 32 states in Mexico, which is evidence of a favorable conditions in this respect in the national context²⁸. However, this condition prevails only in specific areas and not across the whole state.

RELATIONSHIP BETWEEN TOURISM AND ENVIRONMENTAL EDUCATION: A SURVEY ABOUT PERCEPTIONS

The main interest of this section is to investigate who are the important agents plays the fundamental role in the Mayan Riviera area, what are their activities, their relationship with tourism development and what are the possible impacts could be derived from attitudes that govern their conduct (Bayon 1991). To get all the above information we have combined practical and empirical methods, comprising the statistical data of the population and its educational levels for the application of appropriate new techniques of contemporary social investigation. These techniques propose the social interaction

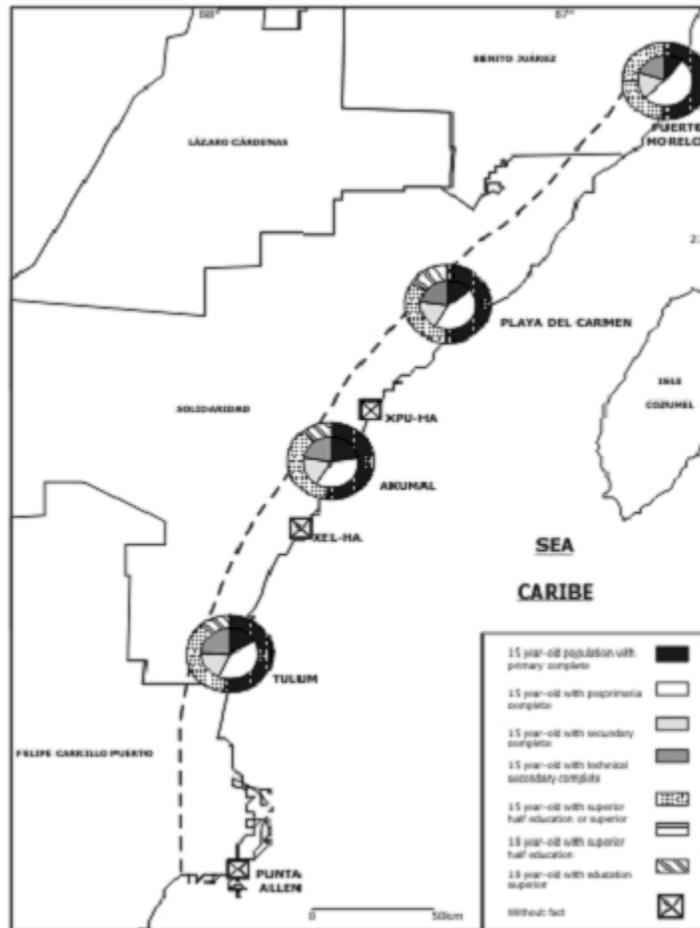


Fig. 6. Even educational in the Mayan Riviera

Table 3: Percentile distribution of the population according to education level and literacy/illiteracy by municipality

<i>Group municipality</i>	<i>15 Years and Older</i>		<i>6 to 14 Years</i>		<i>15 Years and Older</i>		
	<i>Literate</i>	<i>Without instruction</i>	<i>Incomplete primary school</i>	<i>Primary complete</i>	<i>Junior high school</i>	<i>Senior high school</i>	<i>College education</i>
Cozumel	94.8	5.5	16.4	18.3	29.9	20.7	8.1
Felipe CarrilloPuerto	80.4	16.3	26.8	17.9	22.3	11.1	5.11
Isla Mujeres	94.7	5.3	18.0	19.5	32.0	17.5	6.6
Otón P. Blanco	90.4	10.5	18.8	16.0	26.8	17.3	9.9
Benito Juárez	95.7	5.0	13.6	16.3	29.6	25.5	11.9
José Ma. Morelos	81.1	24.5	23.3	19.9	21.5	7.1	3.1
Lázaro Cárdenas	82.6	14.3	29.7	22.7	20.3	8.5	2.9
Solidaridad	91.8	8.0	17.8	19.5	28.9	16.7	7.2
Quintana Roo	92.4	8.1	16.7	17.0	28.0	19.1	9.8

Source: INEGI 2002, XII General Census of Population and Households, 2000.

patterns of the day-to-day life as generators of small-scale social features, including the attitude towards the environment and the environmental behavior of citizens, as well as large-scale structural elements, defined as the structural features of tourism's economic and social geography in the Mayan Riviera.

In order to achieve a qualitative information from the types of social actors in order to focus an adequate environmental educational strategy we applied structured questionnaire, which allowed us to define who are these actors, what is their activities and how interacts with the environment and their perception of "environmental issues" based on their social local practices as to what they do for living, and which interrelations they establish with one another; their knowledge about regulations, laws and their suitability, and how they suggest to educate the population to protect the environment in order to evaluate their willingness towards change.

In the present survey we have try to cover the different part of the Playa del Carmen and Tulum, considering similar proportions of interviews in each place. The main characteristic of this kind of survey is to offer an extensive diversity in the result in relation to environmental perceptions (Ministerio de Ciencia Tecnología y Medio Ambiente CIPS - CIGEA 1999). For this, we have selected one part of the present survey, which includes the questions on environmental interaction, environmental knowledge, sensibility and disposition to take action with respect to environmental change in the principal community like Rivera Maya, Playa del Carmen, and Tulum. A primary task of environmental education in relation to tourism necessary for a possibility of

perceiving their geographical space within the context of their patrimonial environmental value and should be a part of the rescue of indigenous values affected by the rapid assimilation of exogenous patterns.

The results from random data analysis show the structure by types of social actors present in the Mayan Riviera (Table 4). The first three groups; belongs to the tertiary sector of services in the tourist area, such as: tradesmen, services employees and technicians, are also the most perceptive groups and significant with relation to environment, where in some way their activities with the effects on the environment, and are aware of the sufficiency or lack of sufficiency of the existing environmental standards.

The persons who occupied in labour sector also perceive the issues, the relationship among them, and are aware of the corresponding regulations. Farmers are not aware of the environmental issues, they do not relate these issues with their activities, nor the majority of them are aware of the environmental regulations.

Table 4: Typology of the actors of environmental perception in the Mayan Riviera

<i>Type of actor</i>	<i>Activities</i>
Tradesman	Tradesman
Service employees	Dishwashers, cashiers, waiters, cleaning personnel, services in general, taxi drivers and security
Technical	Secretaries, consultants, army, teachers, office workers in general, nurses, accountants and chemists.
Labor workers	Labor workers
Farmers	Farming
Housewives	Housewives
Students	Students

Source: Prepared by the authors based on polls.

Housewives share the same features of farmers; as opposed to the students interviewed. Information is required by the population, although it is worth noting the existing debate in the INTERNET. Hence, the socio-cultural limits of environmental education are present not only in education and the level of instruction, but also in other areas such as in day-to-day activities and in communications.

The last two questions with refer to necessity of environmental education and willingness towards change according to the interpretation of those surveyed, which vary from the non acceptance of knowledge as a basis of adaptative rationalization to the environment., with a series of variations that emerged from suggestions. The latter one explains the consciousness and education in values in an apparent axiological level of environmental perceptions, covering the proposal of passive forms of participation from information communicated in pamphlets, promotional materials, schools, television and other massive communication media, up to suggestions proposing the implementation of fines and sanctions in general to teach the population to take care of the environment. In no case the people's participation in the environmental management was suggested (Fig. 7).

According to survey, there are different perceptions of what the environment means among the various social groups, as well as unequal perceptions and knowledge of regulations referring to land use and the environmental issues in the Mayan Riviera. A limiting factor is that the unbalance between educational proposals and the actual practices of environmental management, which frequently restrain citizens from displaying constructive responses for environmental improvement,

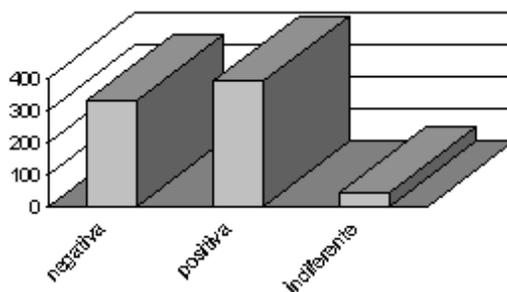


Fig. 7. The population's perception before the environmental problems in the Mayan Riviera

becoming an important barrier for the clarification of the environmental education perspective. Another limitation is compartmentalization; the traditional lack of connection among actors and the absence of use of efficient communication media (Hernández and Abrante 2001).

The great diversity of socioeconomic problems of Quintana Roo, such as poverty, linked with traditional economy and the impact of development projects on the region's environment, the uneven development of the region, traditional habits, are closely linked to the socioeconomic processes. Demands for education management actions were detected. This demands to generate education management actions means a change in attitude and behavior towards natural resources, strengthening those processes directed at training and creating ecological and environmental awareness among communities²⁹ with an economy oriented predominately to tourism. In addition, groups from diverse social and geographical origins have coincided in this area, including the original indigenous inhabitants, national and international immigrants attracted by the boom of tourist centers, which have arrived in large numbers during the last two decades, and the population "mestiza" (*Spanish mixed*) from those different groups.

KEY POINTS

- The Mayan Riviera represents a privileged area for its economic, social and physical geographical peculiarities as well as for its demographic characteristics, which have allowed the development of tourism from Cancun's planned tourism nucleus and subsequent corridor.
- On the threshold of the twenty first century, human development faces new demands of systemic harmony as the main objective of economic progress, with sustainable development rising as a new development paradigm.
- In today's context, achieving sustainable development requires social participation in decision making and in a change in attitudes and habits towards a harmonious interaction with the environment, including all the in-biotic and biotic components at all organization levels.
- The context given by the social and historical development in a territory such as the Mayan Riviera, has peculiarities to be considered in the awareness and education processes of the

social groups involved in the area. It is therefore essential to consider the specific features of the context as well as who are the involved actors in the generation of large- and small-scale factors.

- The application of the appropriate methods in the social sciences with a theoretical positioning concerning the type of development and its origin stemming from tourism globalization demands, makes it possible to link geographical socioeconomic aspects with the individual social features, thus facilitating the future implementation of new actions to promote social awareness and a change towards a pro-environment social consciousness.
- This would allow to contribute from the theoretical implementation of environmental education in the Mayan Riviera in the beginning of the twenty first century.

ACKNOWLEDGMENTS

We are very much thankful to Víctor Quiroz Barrientos B. Sc student in Geography, Institute of Geography, UNAM, for the development of the cartographic material. Also, our sincere thank to Rosalba Vázquez González B. Sc student, Institute of Geography, UNAM, for data processing.

NOTES

- 1 Its income represents 79% of the State's GDP and 10% of the national GDP from tourism (<http://habitat.aq.upm.es/bpal/pgu-lac/exp/e073.html>)
- 2 Its income represents 79% of the State's GDP and 10% of the national GDP from tourism (<http://habitat.aq.upm.es/bpal/pgu-lac/exp/e073.html>)
- 3 Made up of the Isthmus of Tehuantepec and the Mayan World mega-projects. Both are versions of regional developments that tend to get the country involved in a sphere of geopolitical and economic strategy: the former, according to the transit for world commerce, as a new multinational border in the territory's center; the latter, by opening up a virgin territory to the global tourism competitiveness. And, by this means, to a regional integration which comprises part of Mexico and 5 Central American countries (http://www.sct.gob.mx/prog_sectorial_01_06/pg_capitulo8.html#8.6)
- 4 <http://habitat.aq.upm.es/bpal/pgu-lac/exp/e073.html>
- 5 Concept created by Turner and Ash in 1991
- 6 <http://www.visa.com.mx/pr/rivmaya/main.htm>
- 7 Cenotes, a distinctive feature of Yucatan's natural landscape, are formed by the dissolving action of water on limestone, dolines, as a product of limestone's underwater dissolution the roofs of which end up collapsing, while the puddles result from rainwater accumulation in impermeable

depressions. These played an important role in the development of the Mayan civilization, in a region devoid of rivers and lakes. The Mayas settled around cenotes, which constituted the centers of their cities. (<http://www.cityview.com.mx/merida1/tours/ecoturismo/cenote.asp>)

- 8 <http://www.rim.uqroo.mx/rim/agim.htm>
- 9 <http://www.visa.com.mx/pr/rivmaya/main.htm>
- 10 The Sian Ka'an Biosphere Reserve is a large protected area of 528,147 hectares located to the center of Quintana Roo, along the coast of which the great Mayan Reef spreads over more than 100 km.
- 11 Playa del Carmen, with approximately 70,000 inhabitants, still keeps an atmosphere of a small fishing village. Until recently, Playa, as commonly known, was only known as the departure point for the Cozumel cruise ship.
- 12 <http://www.jornada.unam.mx/1999/sep99/990927/eco-pag2.html>
- 13 Sanchez - Crispin, A (2001).
- 14 The number of available beds for tourists is compared to the resident population.
- 15 Base of the Los Cabos Comprehensively Planned Center.
- 16 <http://www.jornada.unam.mx/1999/sep99/990927/eco-pag2.html>
- 17 Some concepts that emerge in this context: spatial interaction, reciprocity, spatial hierarchy, spatial changes (made up from structures and flows). Why do these changes occur and what factors influence the nature of the distribution of structures and flows at any given time? Attempts have been made to answer these questions, and others have opted to examine the variations in the development of tourist destinations by Weaver 1993.
- 18 Understood as the scope of the objectives of the system of interest, according to the General Systems Theory.
- 19 Not extremist conservation, but rational use. Author's note.
- 20 In this sense, Mexico has been a promoter of tourism sustainability in particular and of territory's sustainable development in general. In the "Proposal for the creation of a sustainable tourism area in the Caribbean", environmental sustainability is described considering the velocity and capability limits for the ecosystems' regeneration, social sustainability is defined as the improvement in the standard of living and its indicators, and economic sustainability is defined as the type of stability that favors local markets, fiscal systems that allow to capitalize on the local economy, and tributary politics that allow the local redistribution of tourism revenues. Additionally, political sustainability is expressed as a social construction process that guarantees full incorporation to the development process, the strengthening of social and community organizations, the redistribution of resources and information, and the incorporation of the citizen's responsibility concept. Keeping in mind the importance of the Caribbean Sea as a common patrimony of the region and the role it has played throughout history, as well as its potential to serve as a unifying element in its own development. (<http://www.kiskeya-alternative.org/publica/diversos/aec-decla-esp.htm>).
- 21 For the experimental and constructive learning, and the assessment and solving of real-life issues, using the immediate environment as an educative resource,

- based on the knowledge of ecological, economical, social and cultural processes, thus facilitating social participation in solving the problems inherent to the community and its resources. (Luna 1995).
- 22 <http://www.jornada.unam.mx/2000/nov00/001126/mas-vendidas.html>: "the environmental problems derived from tourism growth will not be solved through decrees or the privatization of Xcared, but through a change in attitude of the parties involved. Listening to the community is essential for valuing environmental care".
- 23 http://www.semarnat.gob.mx/cecadesu/gestion/centros_informacion.shtml
- 24 <http://www.santuariocacel.uqroo.mx/santuariocacel/capi3-3.html>.
- 25 The Mayan Riviera has experienced a so explosive growth rhythm that it has surpassed everything Cancun represented in the beginning, aggravated by the fact that the former lacks the advantages and support that the latter had in its time. This area is undergoing the highest demographic growth in Latin America and the highest immigration percentage in Mexico, concentrated in a single activity, tourism. Playa del Carmen has reached an annual growth rate of approximately 20%, and its population duplicates every two years.
- 26 <http://www.quintanaroo.gob.mx>
- 27 http://www.sedesol.gob.mx/perfiles/estatal/quintana_roo/03_identidad.html.
- 28 <http://www.campeche.gob.mx/sectorsocial/Calidadvida.htm>
- 29 Community; ... a social organism occupying a specific geographic space; an influence of the society to which it belongs; it operates as a more or less organized system consisting of individuals, families, groups, organizations and institutions that interact with each other, all of which define the subjective and psy-chological nature of the community and, at the same time, influence in one way or the other the objective and material character depending on its position - active or passive - with respect to the material conditions where life and activity take place (Arias 1995).

REFERENCES

- Bayón P 2002. El medio ambiente, el desarrollo sostenible y la educación. *Revista Educación*; No. 105; Second Stage; January-April; Havana, Cuba.
- Bayón P 1991. Tourism, environment and sustainable development. *Environmental Conservation*, 18(3): 23-36. The Foundation for Environmental Conservation Switzerland.
- Capurro JE, Herrera J 2002. Manejo sustentable del ecosistema costero de Yucatán. *Revista Avance y Perspectiva*. Vol. 21: 195-204, July-August. Centro de Investigación y Estudios Avanzados del IPN.
- Dachary A 1997. El turismo sostenible en el caribe. *Journal Revista Mexicana de Caribe* No. 4, Universidad de Quintana Roo, Mexico.
- Hernández PA, García O, Abrante O 2001. La educación ambiental como espacio para la relación interdisciplinaria. *Paper presented in International Congress of Pedagogy*, Havana, Cuba.
- Instituto Nacional de Geografía e Informática (INEGI) 2002. Censos Generales de Población y Vivienda, *Census*, Mexico.
- Instituto Nacional de Geografía e Informática (INEGI) 1992. Censos Generales de Población y Vivienda, *Census*, Mexico.
- Instituto Nacional de Geografía e Informática (INEGI) 2002. Censos Generales de Población y Vivienda, *Census*, Mexico.
- Instituto Nacional de Geografía e Informática (INEGI) 2001. Estadísticas Históricas de México, *Census*, Mexico.
- Luna A 1992. Consideraciones geográficas sobre el papel del turismo como factor movilizador de las fuerzas productivas. *Technical Report of the Instituto de Geografía Tropical*, CITMA Havana, Cuba.
- Luna A 1995. *Aspectos territoriales del estudio y la utilización de los recursos naturales en Cuba*. Ph.D. Thesis (Unpublished) in geographical sciences. Instituto de Geografía Tropical, Havana, Cuba.
- Luna A, Nodarse N 2001. Algunos conceptos relacionados con el paradigma ambiental relacionados con las ciencias sociales. *Technical Report of the Instituto de Filosofía*, Havana, Cuba.
- Manchua J 2000. El Plan Puebla Panamá y el Patrimonio Cultural en el Sur de México. *1st Report*. DEAS/INHA. Mexico.
- Mendoza Gómez E 1998. Perspectivas de desarrollo económico de dos comunidades de Quintana Roo: Caobas y Mahahual (1990-2006). *B. Sc. Thesis*. Universidad de Quintana Roo, Chetumal, Mexico.
- Ministerio de Ciencia Tecnología y Medio Ambiente (CIPS-CIGEA) 1999. Percepciones ambientales en la sociedad cubana actual. Un estudio Exploratorio. *Estudio realizado en colaboración por las unidades de medio ambiente y los organos de la montaña del país. Cuba*. Research carried out jointly with the country's environmental units and mountain offices.
- Navarro López D, César Dachary A, Arnaiz Burne SM 1992. Quintana Roo: los retos del fin de siglo. *Centro de Investigaciones de Quintana Roo*. Cambio XXI Fundación Quintanarroense, Congreso del Estado de Quintana Roo. VI legislatura. Chetumal, Quintana Roo, Mexico.
- Novo M 1996. La Educación Ambiental formal y no formal: dos sistemas complementarios. *Revista Iberoamericana de Educación*. No 11; OEI: 75-102.
- Propin E, Sánchez-Crispín A 2002. Tipología de los municipios turísticos de México a fines del siglo XX. *Geographicalia*, No 36:147-157.
- Sánchez-Crispín A 2001. Oaxaca en el contexto del turismo nacional. *Paper presented in Segundo Congreso Nacional de Turismo*, September, Oaxaca.
- Smith-Sebasto 1997. Environmental Issues Information Sheet, *Information Sheet*, Illinois: University of Illinois Cooperative Extension Service.
- Turner L, Ash J 1991. La horda dorada: El turismo internacional y la periferia del placer. In: Turner and Ash (Eds.), *Endymion*, Colección Turismo y Sociedad. Madrid, Spain.
- Weaver D 1991. Alternative to mass tourism in Dominical. *Annals of Tourism Research*, 18(3): 414-432.
- Weaver D 1993. Evolution of a "plantation" tourism landscape on the Caribbean island of Antigua. *Tijdschrift voor Economic. SOC. GEOGRAFIE*, 79(5): 319-333, USA.
- Weaver D 1993. Model of tourism for small Caribbean islands. *Geographical Review*, No. 83: 134-140.