

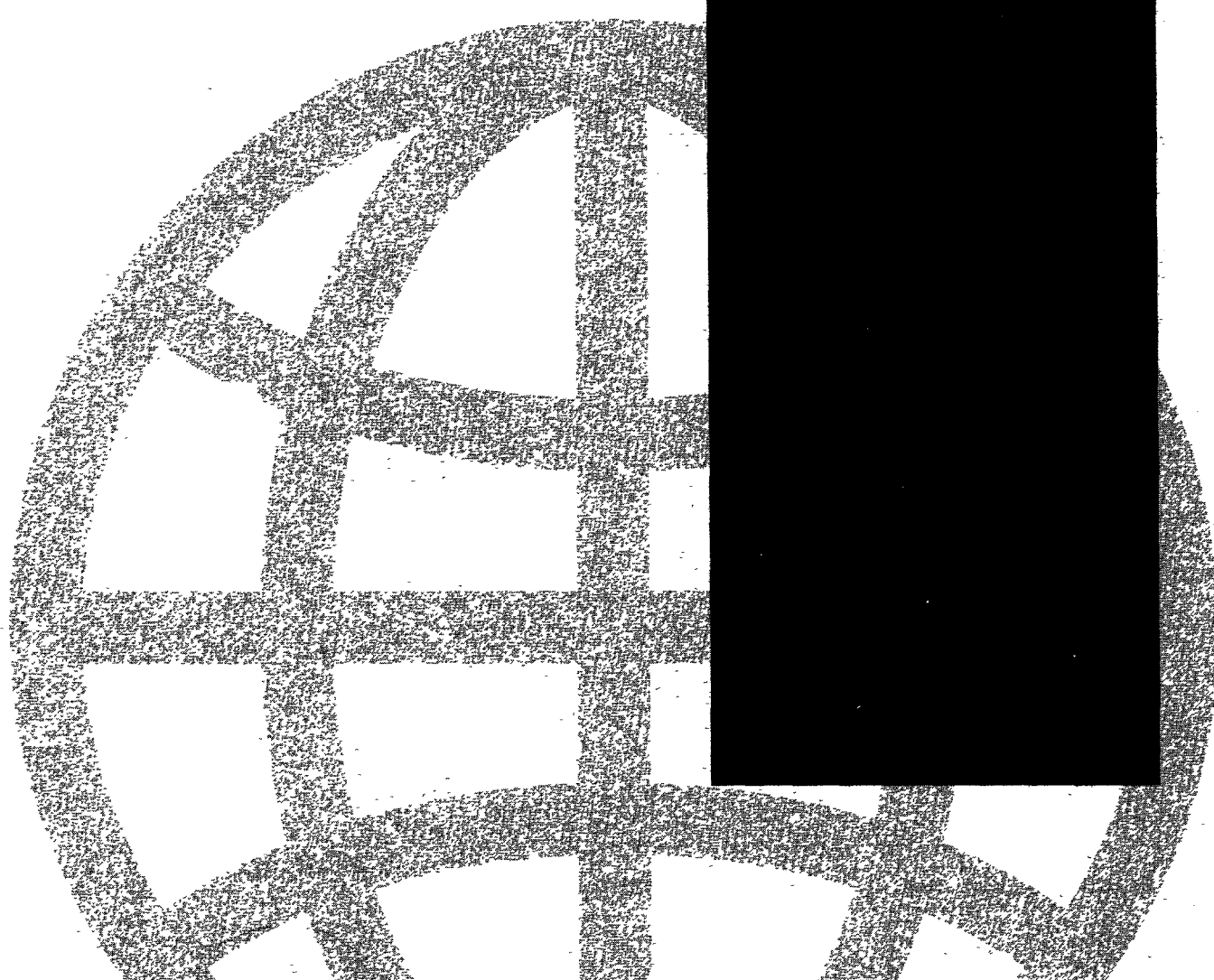
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**Tourism and the Environment  
Case Studies on Goa, India,  
and the Maldives**

*Kalidas Sawkar, Ligia Noronha,  
Antonio Mascarenhas, O.S. Chauhan,  
and Simad Saeed*

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# **Tourism and the Environment**

## *Case Studies on Goa, India, and the Maldives*

Kalidas Sawkar, Ligia Noronha, Antonio Mascarenhas,  
O.S. Chauhan, and Simad Saeed

Tourism plays an important role in the economies of both Goa and the Maldives. For the Maldives, it provides 17 percent of the gross domestic product, over 25 percent of government revenue and around 60 percent of the foreign exchange earnings; and for Goa, it generates 13.7 percent of the state's net domestic product, 7 percent of employment, and 7 percent of state tax revenues. Although both states capitalize on their comparative environmental advantages, that is beach and sunshine, Goa also capitalizes on its unique historical and cultural heritage while the Maldives on its unique archipelagic and coral reef marine environment. Their products and approaches to tourism development are very different: Goa promotes heterogeneous tourism development with upscale and inexpensive charter tourism to international and domestic audiences while the Maldives concentrates on upscale, international tourism. The experiences in tourism of Goa and the Maldives vary in terms of their environmental impacts, social issues and conflicts and institutional responses. There is much that Goa and the Maldives can learn from each other. Other states could also learn from the experiences of these two tourist spots in South Asia.

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# TOURISM AND THE ENVIRONMENT

## AN INTRODUCTION

Emmanuel D'Silva, Jose I. dos R. Furtado and Sherry Russell

The two papers included in this set, presented at an EDI/SAARC Regional Seminar on "Economic Globalization and Environmental Sustainability" in Goa in June 1997, review the impacts of tourism on the environment in the State of Goa, India and in the Republic of the Maldives. Compared with their giant neighboring states, Goa (population 1.2 million) and the Maldives (population 244,000) are small, but blessed among others with local attractions, good beaches and sunshine that draw tourists from near and far.

Tourism plays an important role in the economies of both Goa and the Maldives. For the Maldives, it provides 17 percent of the gross domestic product, over 25 percent of government revenue and around 60 percent of the foreign exchange earnings. For Goa, tourism generates 13.7 percent of the state's net domestic product, 7 percent of employment and 7 percent of tax revenues. Both states capitalize on their comparative environmental advantages: beach and sunshine. Goa also capitalizes on its unique historical and cultural heritage while the Maldives on its unique archipelagic and coral reef marine environment. Their products and approaches to tourism development are very different: Goa promotes heterogeneous tourism development with upscale and inexpensive charter tourism to international and domestic audiences. The Maldives concentrates on upscale, international tourism. The experiences in tourism of Goa and the Maldives vary in terms of their environmental impacts, social conflicts and institutional responses (Table 1). After reviewing both experiences, there is much that Goa and the Maldives can learn from each other. Other states could also learn from the experiences of these two tourist spots in South Asia.

The preservation of the natural environment, the prudent use of natural resources, disposal of solid waste and sewage, and the depletion and deterioration of groundwater—attributable to tourist inflows—are, among others, issues which both governments face. In Goa, "the growth of coastal tourism has been rapid and uncontrolled," notes the paper by Sawkar *et al.* Tourism development has resulted in, the loss of biodiversity, erosion of sand dunes, declining fish catches, accretion and siltation and depletion of groundwater.

Although the environmental diversity and sensitivity of Goa has been widely known, a complex mixture of customary rights, land ownership, a variety of stakeholders with very differing interests, and ineffective institutional and political structures seem to have made it difficult for Goa to define a tourism strategy and to enforce its implementation. In the Maldives, the rapid increase, *albeit* government controlled, in the number of resorts over the last two decades has also taken its toll on the environment. The paper on the Maldives by Saeed, acknowledges environmental damage from beach erosion, an alteration of ocean currents, loss of biodiversity, water, soil and nutrient pollution and damage to its coral reefs most notably from mining for construction, anchoring of boats and diving. The Government has played a key role in promoting tourism on unoccupied islands (or abandoned islands where customary usufruct rights were compensated) through certain traditionally powerful families and with certain funding arrangements to encourage foreign investments; the government has been closely monitored the development of tourism.

Tourism development has many social impacts. The Maldives has avoided much social conflict due to its relatively isolated geographical location and small, somewhat homogenous population and culture. The Maldives' strategy of separating foreign tourists from the local residents by developing tourist resorts on uninhabited islands is critical to minimizing social impacts. This strategy has managed thus far to avoid social conflicts, but with the leakage of information from tourist areas, and the separation of resort employees from their families, the sustainability of this strategy under existing institutional and political structures remains to be seen. In contrast, as Goa does not have land which is untitled or unowned or which is not of some historical significance, the needs of tourists and the local population in Goa come into frequent conflict over the use of local resources (e.g., water, beaches, and transport). The Goan social scene is further complicated by the state's porous borders with the rest of India. While Goa's geographical location improves domestic demand for tourism, it has also led to a large influx of labor from adjoining states, further exasperating social impacts.

Conflicts over resource use and institutional responses to them is another area in which the experiences of Goa and the Maldives differ. The situation in Goa is rather complex due largely to the number of stakeholders involved in tourism: luxury hotels, family-run guest houses, the needs of tourists, local residents, and other sectors of the economy. Mechanism for resolving conflicts among the various resource users do exist, such as the panchayats ("comunidades") and the courts, but the long backlog of cases has delayed justice. The high number of conflicts among users suggests that an improved institutional response is necessary. Comparatively, the situation seems less complex in the Maldives. At this point, legislating and enforcing environmental quality controls for tourism appears to create fewer conflicts among residents because of the geographical separation of resorts, the small number of facilities and the limited number of stakeholders involved in tourism. As tourism expands in the Maldives, additional review of potential conflicts over resource use must be considered.

Environmental legislation and regulatory mechanisms are in place in both states. The Maldives has developed its institutional capacity to address these problems and to facilitate unique solutions (e.g., encouraging European airlines to take back the trash to the points of origin of the tourists). Having carried out a "proper evaluation of tourism" in 1983 and a survey in 1995 to identify the major existing environmental problems facing the resorts, the Maldives seems further down the road in its development of tourism. But, while the Maldives has increased its regulation of tourism, it tends to focus on future environmental damage, viewing current damage as more aesthetic rather than a serious threat. The sustainability of such policy is questionable. In Goa, while a Master Tourism Plan is in place, the implementation of the laws and regulations appears to be somewhat tardy. Although the paper alludes to several government department charged with various aspects of tourism planning in Goa, institutional strengthening is a clear issue. Similarly, a systematic study of the environmental impacts of tourism and the implementation of a monitoring and management system would also aid Goa. Fortunately, some of these issues will be covered by the "India Environmental Management Capacity Building Technical Assistance Project," supported by the World Bank, in which Goa is included.

In sum, these two cases provide a brief introduction to the complexity of pursuing tourism as an avenue to development. Much can be highlighted from the two. The Maldives has excelled in moving forward with strengthening its environmental regulatory and enforcement framework. Not only has it increasingly developed its institutional capacity to address environmental problems related to tourism, but it has also concentrated its efforts on the "polluter pays" principle. In Goa, although institutional responses and the development of a tourism strategy which integrates the needs of all stakeholders has lagged, the active lobby of its citizenry at all levels, which has intensively documented its environmental impacts and brought environmental concerns to the public agenda, should be highlighted. The active

participation of all stakeholders in the planning process lends itself to greater sustainability of tourism in the long-run.

Clearly the complexity of both cases requires that Goa and the Maldives carefully review the sustainability of their approaches and how to strike a balance between tourism development and protecting the natural and social environments. As in any other sector of an economy, tourism requires a sound, well-defined and executed approach in which the government, the various stakeholders and the public cooperate.

We wish to acknowledge the contributions of the two papers and the comments of Mr. Gert van Santen.

**Table 1. Benefits and Costs of Heterogeneous Tourism in Goa (G)  
and Upscale Tourism in the Maldives (MV)**

BENEFITS	COSTS
<b>Economic / Financial</b>	
<ul style="list-style-type: none"> <li>* Foreign revenue earnings (G, MV)</li> <li>* Funds raised from taxes, etc. (G, MV)</li> <li>* Attraction of external/foreign investments for local infrastructure/services (MV)</li> <li>* Diversification of local employment and income (G, MV)</li> <li>* Service sector employment opportunities (G, MV)</li> <li>* Support employment opportunities: e.g., Agriculture, Fisheries, Handicrafts, Cottage industries (G, MV)</li> <li>* Development of export markets for local products, foods, etc. (G, MV)</li> </ul>	<ul style="list-style-type: none"> <li>* Increased local cost of living (G)</li> <li>* Seasonality of income and employment (G, MV)</li> <li>* Unstable market (G, MV)</li> <li>* Cost of enforcement/administration (G, MV)</li> <li>* Cost of training guides, managers, etc. (G, MV)</li> <li>* Liability of service providers (G, MV): - Polluter Pays Principle (MV)</li> </ul>
<b>Political/Institutional</b>	
<ul style="list-style-type: none"> <li>* Maintenance of population within political boundaries (G, MV)</li> <li>* Maintenance of future development options (G, MV)</li> <li>* Small number of stakeholders (MV)</li> <li>* Environmentally active civil society (G)</li> <li>* Government-owned land resources leased to entrepreneurs (MV)</li> <li>* Unoccupied or abandoned lands used for tourism with compensation for usufruct rights (MV)</li> <li>* Tourism policy closely monitored by the government (MV)</li> </ul>	<ul style="list-style-type: none"> <li>* Exposure to undesirable social problems, e.g., child labor, pedophiles (G)</li> <li>* Separation of local population from external public (MV)</li> <li>* Large number of stakeholders (G)</li> <li>* All lands privately or publicly owned used for tourism (G)</li> <li>* Absence of, or delays in conflict resolution through courts or traditional community organizations (G)</li> </ul>

<b>Cultural / Social</b>	
<ul style="list-style-type: none"> <li>* Exposure to new information, lifestyles (G, MV)</li> <li>* Maintenance of traditional knowledge/products (G, MV)</li> <li>* Historical and cultural heritage (G)</li> <li>* Conflict resolution by panchayats or comunidades(G)</li> <li>* Conflicts limited by allocating leases to certain traditional powerful families (MV)</li> </ul>	<ul style="list-style-type: none"> <li>* Disruption of culture (G, MV)</li> <li>* Enhanced local expectations due to exposure to affluent visitors (G, MV)</li> <li>* Labor influx (G)</li> <li>* Conflicts over local beach and water resources, and transportation (G)</li> </ul>
<b>Environmental / Conservation</b>	
<ul style="list-style-type: none"> <li>* Incentives/funds for parks/resource management: e.g., waste removal (MV)</li> <li>* Incentives/funds for resource management research (G)</li> <li>* Improved environmental education (G, MV)</li> <li>* Unique coral reef/island resources (MV)</li> <li>* Strong environmental regulatory and enforcement framework (MV)</li> </ul>	<ul style="list-style-type: none"> <li>* Beach degradation due to improper waste management by tourists (G)</li> <li>* Groundwater depletion due to increased local demands (G)</li> <li>* Water scarcity due to over-exploitation for tourism industry (G)</li> <li>* Groundwater pollution due to improper waste management (G)</li> <li>* Beach and coastal erosion due to unsuitable infrastructure development (G)</li> <li>* Coral reef damage due to mining for construction, anchorage of boats and diving (MV)</li> </ul>

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# **TOURISM AND THE ENVIRONMENT**

## **ISSUES OF CONCERN IN THE COASTAL ZONE OF GOA**

Kalidas Sawkar, Ligia Noronha,  
Antonio Mascarenhas and O.S. Chauhan

### **Introduction**

When Goa joined the Indian Union in December 1961, its only large industry was the export of its rich ores of iron and manganese. Goans depended on indigenous fish and coconuts for their vital nutritional requirements. The popularity of milk and vegetables amongst local inhabitants was low, and most of their dietary and other consumer items were imported. Before 1961, Goa had very little “development” in the modern sense of the term. With rich coastal biodiversity and abundant natural resources, the quality of life and the social fabric was good. Its main assets were its genial and peace loving people, a tranquil and unspoiled environment, and an absence of population pressure<sup>1</sup>.

Tourism was adopted as a key sector for Goa’s development, not only for the well-established reasons of increasing income and employment but also for its potential to generate non-manual employment in a state with an increasingly educated work force and limited industrial growth. Fearing industrial pollution, the planners and decision-makers opted for tourism as an avenue to earn the state’s income over increased industrial development in addition to mining. Except at academic levels, very little awareness and understanding existed back then among planners about the processes of the life support systems of the coastal environment and the interactive roles played by each component. This paper highlights the issues and the implications of tourism on the coastal marine and the socio-economic environment of Goa.

### **Nature and Growth of Tourism in Goa**

Most of the tourism in Goa is concentrated in the coastal stretches of Bardez, Salcete, Tiswadi and Marmagao. Over 90 percent of domestic tourists and over 99 percent of the international tourists frequent these areas. Consequently, beach tourism is the only type that is avidly encouraged by policymakers and other concerned parties alike. Goa is visited by two types of tourists with distinct needs which this state satisfies. The first is the domestic tourists, who comprise 80 percent of all tourists. These people come in search of the culture that is “different” from the rest of India, as the Goan image holds a degree of mysticism, a sense of freedom and “unconventional” dress style. The second is the international tourists who visit Goa purely for the natural environment—sun and beaches. Within the category of international tourists are there are two sub-categories: backpackers and charter tourists. Although both visit Goa for the beaches, they stay away from each other. The backpackers are not found in areas of charter tourists; they prefer to mingle and live with the local communities. Whereas, the charter tourists tend to stay in the luxury starred hotels. Domestic and international tourists also differ in terms of the areas they frequent. For the domestic tourist, the beaches hold limited appeal, so domestic tourists remain away from the places frequented by the international tourists.

The timings of visits are clearly different for the domestic and the international tourists. In previous decades, a clear off season for all tourists could be identified, today this is not so for domestic

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<sup>1</sup> Alvares, C. 1993. “Fish, Curry and Rice: A Citizen’s Report on the State of the Goan Environment.” *Ecoforum*. Goa, p. 260; Mascarenhas, A. *et al.* 1997. *The Coastal Zone of Goa: Then and Now*. Abstract 29. *Seminar on Coastal Zone Environment and Management*. Mangalore University. February 12-14, pp. 50-52.

tourists, who come throughout the year albeit in larger numbers in the non-monsoon months. Conversely, international tourists avoid the monsoon months, as for them the use of the beach is the prime attraction to come to Goa.

Table 1 gives the share of domestic and international tourists over the last 15 years. The bulk of tourists coming to Goa are domestic, and this trend has grown considerably in the last few years.

**Table 1. Share of Domestic and International Tourists of Goa**

<i>Year</i>	<i>Total tourists</i>	<i>Share of domestic (%)</i>	<i>Share of international (%)</i>	<i>Year</i>	<i>Total tourists</i>	<i>Share of domestic (%)</i>	<i>Share of international (%)</i>
1981	439,015	93.33	6.67	1989	862,443	89.40	10.60
1982	477,165	94.13	5.87	1990	881,323	88.16	11.84
1983	530,015	93.67	6.33	1991	835,067	90.63	9.37
1984	669,992	90.71	9.29	1992	896,010	86.45	13.55
1985	775,212	88.05	11.95	1993	969,234	82.39	17.61
1986	834,081	88.31	11.69	1994	1,059,595	80.16	19.84
1987	861,448	89.02	10.98	1995	1,107,705	79.31	20.69
1988	854,935	89.11	10.89	1996	1,150,000	78.26	21.74

*Source:* India, Government of Goa, Department of Tourism. Personal Communications.

The various factors that have contributed to this rise in domestic tourism are:

- increased disposable income of the middle class,
- increased urbanization and stress of living in cities and towns,
- increased ownership of cars, which is making domestic tourism more attractive, especially among the upper-middle and middle classes<sup>2</sup>,
- improved employment benefits, such as the leave travel concession,
- development of inexpensive mass transport and improved connections to various places of tourist interest<sup>3</sup>,
- increased number of cheap accommodations and resorts,
- greater advertising targeted at domestic tourists both by the central and the state governments, as well as the tourist industry, and
- development of time sharing of holiday accommodations, that is being targeted at the middle class.

According to official tourism statistics, while the period of 1981-86 saw an increase in domestic and international tourists, the period of 1986-91 saw a slow down in growth rates for domestic tourists and a fall in growth rates for international tourists (Table 2).

**Table 2. Growth of Tourism in Goa**

<sup>2</sup> For example, the number of registered cars, jeeps and taxis has gone up sharply from 310,000 in 1960 to 3,330,000 in 1993.

<sup>3</sup> The commissioning of the coastal Konkan Railway and the modernization of South-Central Railway will considerably increase the accessibility of Goa to the rest of India. A form of weekend tourism is likely to emerge from this, which may have environmental and economic impacts similar to cruise tourism in the Caribbean Islands.

<i>Period</i>	<i>Average Annual Growth Rates (%)</i>	
	<i>Domestic</i>	<i>International</i>
1981/82-86/87	7.98	27.20
1986/87-1991/92	2.75	-1.34
1991/92-95/96	3.90	31.00

*Source:* India, Government of Goa, Department of Tourism. Personal Communications.

Tourist arrivals in Goa have increased over the last five years with a higher rate of growth of international tourists than domestic tourists. Goa's growing importance on the Indian tourist map for international tourists can be seen from Table 3. While in the early 1980s, the share of international tourist that came to Goa was less than 3 percent, by the mid-1990's, the share has increased to over 10 percent.

**Table 3. International Tourist Arrivals in India**

<i>Year</i>	<i>Tourist arrivals in India (millions)</i>	<i>Share of Goa in total tourist arrivals in India (%)</i>	<i>Year</i>	<i>Tourist arrivals in India (millions)</i>	<i>Share of Goa in total tourist arrivals in India (%)</i>
1981	1.26	2.4	1989	1.74	5.2
1982	1.29	2.3	1990	1.71	5.9
1983	1.30	2.3	1991	1.68	7.8
1984	1.21	4.9	1992	1.87	6.4
1985	1.26	7.1	1993	1.82	9.3
1986	1.45	6.2	1994	1.87	11.2
1987	1.48	6.4	1995	2.10	10.9
1988	1.59	5.9			

*Source:* Center for Monitoring the Indian Economy. 1995. *Basic Statistics of the Indian Economy*; and India, Government of Goa, Department of Tourism. Personal Communications.

In the earlier years, the international tourist was one in search of alternative lifestyles and mingling with local communities; however, in more recent years, a considerable homogenization of the traveler has occurred in terms of package tourism. In the 1980s, the domestic tourist came from the middle class and from the adjoining states; however, now domestic tourists that come to Goa are diversifying, as the place attracting a number of the rich young elites from more distant states. In response to these changes, the tourism industry in Goa has evolved into a curious mix of low-budget tourism and up-market hotel development, a mix that is marked with tensions and potential conflicts over the appropriation of resources<sup>4</sup>.

### **Impacts of Tourism in Goa**

<sup>4</sup> Wilson, D. 1997. "Paradoxes of Tourism in Goa." *Annals of Tourism Research*. 21(1): 52-75; Wilson, D. 1997. "Strategies for Sustainability: Lessons from Goa and Seychelles." *Sustainable Tourism*. M. Stabler (Ed.) Wallingford: CAB International.

Tourism development among policy-makers tends to be discussed in terms of the factors that are of concern to the national and the state governments. The discussion is very much economic in nature with some industry orientation and focuses on factors such as the revenues from tourism, the foreign exchange earnings, the employment created and the income generated<sup>5</sup>. The focus has always been on the implications of tourism development on the economy of Goa and on the relations among the various components of its tourism industry. The microlevel impact of tourism on the destination area immediately around it has been relatively less studied, if at all<sup>6</sup>. The impacts of such a large-scale, diversely interactive activity as tourism should be more inclusive of all components. Tourists travel to and from their destinations, are accommodated, fed and entertained. All these activities require extensive infrastructural networks and support services that may not remain limited to the geographical positions of a tourist's movements. Moreover, the effects result very much from the interactions among the tourists and the agents in the destination area.<sup>7</sup>

### *Economic Aspects*

The foreign exchange earning potential of the tourism industry is one of the main attractions for its support by national governments, while state governments are more concerned with its contribution to local income, taxes and employment. On an average, earnings in foreign exchange for the last three years were US\$43-57 million<sup>8</sup>. It is estimated that tourism contributes to around 13.7 percent of Net State Domestic Product; 7 percent of employment and 7 percent to state tax revenues. The money spent by domestic and international tourists is received by different segments of the industry which provide the supporting goods and services.

Tourist receipts can be classified into five categories: accommodation and food, shopping, internal travel, entertainment and miscellaneous items. Table 4 provides an overview of the distribution of expenditures among the five categories for international and domestic tourists.

Moreover, in 1992, about 90 percent of the domestic tourists who came to Goa spent less than US\$35 per capita per day. Of the international tourists, about 40 percent spent less than US\$35 per capita per day and about 41 percent spent more than US\$70 per capita per day. As mentioned earlier, however, this trend is changing today (Table 5). In the last few years indications are that the domestic tourist coming to Goa is increasingly from the more affluent segments of society, and the international tourist have increasingly been more of the inexpensive charter packages.

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<sup>5</sup> See Kirloskar Consultants Ltd. 1994. *Report on Study of Tourism Industry in Goa*. December.

<sup>6</sup> See the Indian Institute of Social Sciences (1989) for an attempt at studying socio-economic impacts.

<sup>7</sup> Impact studies tend to treat destination areas as passive recipients of the impacts of tourism. This is however not so and the need to understand the processes of interaction between tourists and host communities is crucial to an understanding of impacts.

<sup>8</sup> This figure is probably an underestimate, as it is a record of foreign currency converted in Goa; however, a considerable amount of foreign currency that is spent in Goa is converted at the first port of entry, typically Mumbai (Bombay) or New Delhi. If India's total foreign exchange earnings from tourism are considered and Goa is apportioned an amount based on the share of tourists that come to Goa, then the amount rises to around US\$115 million.

**Table 4. Distribution of Expenditures for International and Domestic Tourists**

<i>Category</i>	International Tourists	Domestic Tourists
	(%)	(%)
Accommodations and food	53.95	58.20
Shopping	24.84	26.70
Internal transport	13.63	10.40
Entertainment	2.61	1.80
Miscellaneous expenses	4.97	2.90
Average length of stay	9 days	5 days
Total amount spent per visit	US\$590	US\$110

Source: Kirloskar Consultants Ltd., 1994. *Report on Study of Tourism Industry in Goa*. December.

**Table 5. Estimated Distribution of Expenditures and Distribution of Tourists in 1992**

<i>Type of tourist</i>	<i>Percentage distribution of daily expenditures (US\$)</i>					<i>Average total expenditures per stay (US\$)*</i>
	<i>(US\$)</i>					
	<17	17-34	34-51	51-69	>69	
Domestic	63	27	4	3	3	105
International	18	22	11	8	41	590

\* Average length of stay for a domestic tourist is estimated to be 5 days; 9 days for an international tourist.

Source: Kirloskar Consultants Ltd., 1994. *Report on Study of Tourism Industry in Goa*. December.

Table 7.2.

These expenditures form the direct output of the industry. However, the industry buys goods and services from other sectors of the economy. This additional output produced through inter-industry spending is the indirect output of the industry and is normally estimated using multipliers. It is not quite clear how much tourism is actually benefiting the Goan economy as a whole because a large part of the goods required to support the tourism industry is brought from outside the state.

#### Tourism: Food and Agriculture

Food and beverages comprise the largest component of the expenditure of domestic tourists (40 percent) and second largest component of the expenditures (accommodations being the largest), of the international tourist (20.5 percent). Increasing the amount of local food used in the tourism industry is a way of increasing backward linkages from tourism, involving the local community and therefore, moving toward more diversified and sustainable development. Yet, policymakers have not focused on strengthening the economic linkages between tourism and the food sector. The hotel food supply chain has not been studied in Goa and local surplus production from agriculture and fishing could be potentially integrated into this chain as an additional means to generate local income. However, a careful balance must be struck between producing for tourists' requirements and ensuring food supply at reasonable prices to the locals.

## Regional Imbalances

As previously mentioned, most of the tourism development in Goa is concentrated in the four coastal stretches of Bardez, Salcete, Tiswadi and Marmagao. These areas are, similarly, the most developed regions of Goa, accounting for approximately 66 percent of Goa's Gross State Domestic Product (GSDP). They have dense settlements and are more developed in terms of infrastructural support services. About 70 percent of small-scale units, 78.5 percent of the capital investment in small industry and over 68 percent of the employment in this sector are found here. Historically, the region developed relatively faster than the rest of the state due to its coastal location, which provided easy access for sea trade and was attractive for settlement. There are a number of interesting locations with tourism potential exist in the hinterland; however, very little has been done to develop them. Hence, there is a considerable imbalance between the coastal and the hinterland regions in infrastructural and other indicators of economic development.

## Investment in the Tourist Industry

Since tourism's acceptance as the primary avenue through which to develop, it has grown in scope to be comparable with mining, the only other industry in Goa. State expenditures on the tourism industry has doubled over a period of 10 years. Expenditures amounted to approximately Rs.15 million in 1986-87, and they grew to approximately Rs.30 million by 1996-97 (Table 6).

**Table 6. Expenditures of the State on Tourism per Plan**

<i>Annual plan</i>	<i>Actual expenditures (Rs. Millions)</i>
1992-93	22.96
1993-94	25.93
1994-95	27.01
1995-96	29.25
1996-97	30.00
EIGHT PLAN (1992-97)	135.15

*Source:* India, Government of Goa, Department of Town and Country Planning and Department of Statistics and Evaluation Department. Personal Communications.

Private investment also increased. If the investment per room by hotel category, which was estimated by Kirloskar Consultants 1994, investment in the hotel industry has risen from Rs.2.08 billion to Rs.3.25 billion in 1996, an increase of Rs.1.19 billion in just 2 years. If the type of hotels that have been built over the last two years is analyzed, investment in starred hotels increased by 39.5 percent during this period while that in other hotels has gone up by 47.5 percent<sup>9</sup>. Tourism studies suggest that the financial performance of the hotel industry is poor compared to several other industries in the state although no evidence has been presented to back this claim<sup>10</sup>.

<sup>9</sup>There are six categories of approved hotels in India ranging from one- to five-star deluxe. Approval ratings are granted by the Department of Tourism based on suitability criteria for international tourists. These starred hotels are required to maintain certain minimum standards of services and amenities.

<sup>10</sup> India Institute of Social Sciences. 1989. *Tourism in Goa: Socio-Economic Impacts*. New Delhi; Kirloskar Consultants Ltd. 1994. *Report on Study of Tourism Industry in Goa*. December.

From the statistics available and through observation, local participation in the tourism industry is high in terms of the number of small hotels and paying guest accommodations, yet the bulk of economic investment is concentrated in just a few hotels. Thus, using just the accommodation sector as a proxy for the tourism industry as a whole in 1996, almost half of all investment in the sector was in the hands of just four large hotels; the largest hotels together controlled 69 percent of all investment, and the balance was made up by smaller hotels.

### Seasonality of Income and Employment

The industry peaks and troughs: October-February being the good months and June-August being the lean months due to the monsoon. This seasonality requires the tourism industry to respond by adjusting the output in terms of the services it provides which affects hotels, restaurants and their employees. Because of the search and initial training costs that the employer faces, and because of the need to cater to sudden spurts of demand, a hiring and firing policy is not cost-effective to an employer<sup>11</sup>. The first reaction of employers is to keep labor, but reduce the work hours, a situation akin to holding inventories of labor in excess of demand. This strategy is supported by employing unskilled labor during the peak season, who are then laid off during the off season as the costs of hiring and firing unskilled labor are not high. A sample survey indicates that the highest seasonality of income (in terms of lower off season earnings) and the highest seasonality of employment (in terms of hours worked per week) are experienced by the smaller hotels<sup>12</sup>. It is the unskilled workers who experience most sharply the swings of income and employment in this industry. This is a social cost of the industry to which hitherto scant attention has been paid.

### *Social Aspects*

#### Shifts in Population and Traditional Occupations

In the tourist belts of Calangute-Candolim in Bardez, a shift in the composition of the resident population has occurred to include a large number of migrants from the states of Karnataka, Rajasthan and Kashmir due to potential employment in the tourism industry. Most of these people are engaged in selling artisanal pieces, handicrafts and garments. It cannot be denied that tourism has also given a boost to local art and handicrafts; however, the commercialisation of such arts and crafts has resulted in a certain deterioration in their quality as they are being manufactured for bulk sale. At another level, Goan cultural practices are being used as tourist attractions, such as Carnival and Shigmo, which have been given a certain orientation to suit the demand of tourists. Much of the spontaneity of these practices has been lost<sup>13</sup>.

Moreover, some of the villages along the coasts have become very tourist-oriented and thus, shifted away from their traditional occupations. A couple of decades ago, these villages were predominantly fishing- or agricultural-oriented. Tourism has increased land prices and encouraged locals to sell their land, thereby sharply increasing the competition for land in the tourist belt. It can be argued that tourism has accelerated the decline of agriculture in Goa, by providing a viable alternative for the lateral transfer of investment capital, land, and labor by the locals. In the tourist belt, land conversion

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<sup>11</sup> D'Douza, E. 1997. *Economy and Institutions: Essays on Goa*. Bombay: Himalayan Publishing House.

<sup>12</sup> *ibid.*

<sup>13</sup> *ibid.*

from agriculture to non-agriculture uses has occurred<sup>14</sup>. In the fishery sector, while fishermen do not always compete with tourists for shore space, there are instances on the Goan coasts where traditional fishing operations have been constrained by lack of shore space. In some areas, fishing ports and the houses of fishermen have been displaced by resort development.

Economic forces are driving social forces here. On the one hand, expectations of higher returns, from the sale of land to builders and/or from hiring out houses to tourists rather than from actively engaging in agriculture or fishing are creating incentives for shifting occupations. On the other hand, social forces are at work in the sense that tourism provides locals with an opportunity to keep their women at home rather than have them till the soil or sell fish in the market. This is perceived as a movement upwards for the locals, and a factor that cannot be ignored in the dynamics of the intersectoral movement of land and labor. Often large tourism development projects require the displacement of some of the original inhabitants of the area. Some of those displaced by present projects, chose to invest their compensations in capital assets, e.g., taxis, and have become to a degree upwardly mobile in an economic sense. However, there are others who due to their initial circumstances are unable to move along the same path, and instead become marginalized, having to replace self-employment for menial jobs in the very resorts that have displaced them. The issue of income distribution needs to be examined.

#### Impacts on the Goans' Sense of Community

One of the impacts of tourism on the Goan community is the "creeping expropriation" felt by the locals. This feeling of being pushed out arises from the fact that starred hotels have effectively gained control over beach resources, which locals have used for generations, and are selling access to them at a price. The area that is available to them as commons is increasingly reduced and overpopulated, causing the locals to avoid the beaches as a whole.

Consequently, the growth of tourism in Goa has been accompanied by strong anti-tourism activism<sup>15</sup>. Much of this activism has been targeted at: international tourists; unplanned growth; the use of state machinery to promote tourism, which is perceived as distorting the image of Goa and Goan society, the violation of regulations by the hotel lobby; the overdevelopment of the coastal strip; the preferential access to resources, which large tourism projects are able to get relative to small projects and local communities; the impact on local society from exposure to drugs, aids and more recently, pedophiles<sup>16</sup>. The bottom-line is that there has been little involvement of the public in the policy decision-making process resulting in a strong sense of alienation about decisions that are affecting the lives of the local community.

#### *Environmental Aspects*

Coastal zone environment is particularly fragile and can be divided into two areas: the marine part and the land part. For the purpose of this discussion, coastal waters, bays, backwaters, creeks, tidal inlets, and estuaries are considered as components of the marine part of the coastal zone. The sandy

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<sup>14</sup> While conversion of agricultural land to non-agricultural is prohibited by law, the Government of Goa has granted leniency in certain circumstances given the high price of land and the demand for housing.

<sup>15</sup> The most prominent groups are Jagrut Goenkaranchi Fauz (JGF), Citizens Concerned about Tourism (CCAT), Saligao Nagrik Samiti and the Goa Foundation.

<sup>16</sup> This critique is found in the various publications of the aforementioned groups, was reported in local newspapers and more recently, is summarized in the Master plan for Tourism in Goa: Statement of Objectives and Recommendations, 1997, submitted to the government by five NGOs. Also see, Alvares (1993) for an environmental critique of tourism in Goa.

beaches along with two dunes (one which runs along the seashore, and another that runs parallel but about 100 to 500 meters away from the seashore) and their vegetation are considered components of the land part. In between these dunes there lies a sandy plain, which acts as a buffer zone between the main land and the sea.<sup>17</sup>

### Impacts to the Marine Part of the Coastal Zone

The marine part of the coastal zone provides many functions and in the present context are:

- To support marine flora including subtidal varieties, such as mangroves. The mangrove ecosystem itself serves as a habitat for diverse types of species of birds and marine biota, in addition as the protection of the coastline from erosion, tides and storms<sup>18</sup>.
- To support a wide variety of marine organisms including mammals. The marine organisms among themselves form a very intricate, well-established food chain starting with the chemical constituents of sea water called nutrients.
- To function as a natural thermostat which balances the climate on the subregional, regional and global scales.
- To disperse riverine load effectively in near-shore regions.

Most of the above functions are interactive in nature. In the coastal current movement, the most important force is the tidal cycle, which drives the sea water along the shoreline, bays, creeks and upstream through the mouths of rivers and estuaries. Other important forces are the near shore and riverine, or estuarine currents. All these currents carry natural sediment load and any other marine discharge, resulting from manmade activities, and deposits them at a site defined by an equation containing parameters, such as current velocity, counter currents, topography of the seabed or riverbed and other oceanographic factors. The transportation capacity of the currents has to be understood in terms of its effect on marine biota. For example, a rise of a few degrees in temperature of a sea water body would adversely effect species occurrence and predominance among biota, which in turn could influence other life forms. Also, a sudden appearance or disappearance of a species due to anthropogenic factors may cause stress in other species. Given the interactiveness and complexities of the coastal environment, any developmental activity should to be preceded by the Environmental Impact Assessment studies to forestall environmental degradation.

The following impacts on the marine part of the coastal zone have been observed while surveying the ecosensitive coastal areas of Goa. They have been represented in a flowchart in the Annex. The work was carried out by National Institute of Oceanography on request from the Ministry of Environment and Forests, Government of India, in August/September, 1996<sup>19</sup>.

- Loss of mangroves: Thick mangroves on the outskirts of Panaji, at Sao Pedro near Old Goa, around Talpona backwaters and at innumerable other locations are being reclaimed. In addition to the biological impacts of the loss of mangroves, the tidal

<sup>17</sup> Lobo, U. 1988. "Environmental Aspects of Silica Sand Mining from Coastal Sand Dunes." *Earth Resources for Goa's Development*, pp. 521-523.

<sup>18</sup> Jagtap, T.J., V.S. Chavan and A.G. Untawale. 1993. "Mangrove Ecosystems of India: A Need for Protection." *Ambio*. v 21, pp. 252-254.

<sup>19</sup> National Institute of Oceanography. 1996. *Comments on the Coastal Zone Management Plans of Goa*. Report submitted to India, Ministry of Environment and Forests. New Delhi.

waters could flood the surrounding coastal areas causing erosion and thus opening the estuarine banks to storm surges<sup>20</sup>.

- Reduced fish catch and species: A steady decrease in the total annual fish catch has been observed in Goa. The catch has declined from 105.44 thousand tones in 1993-94 to 101.90 in 1994-95 and in 1995-96, to 87.82 thousand tones<sup>21</sup>. More specifically, at Sancoale-Chicalim Bay, the decrease in production of certain varieties of shellfish and crabs, both local delicacies, is believed to be due to the land reclamation of mangrove swamps and to the construction of roads to the Sao Jacinto Island and at Talpona. More generally, one or more of the following factors may be responsible for the reduction in fish catch:
  - a) Unscientific fishing practices: These can include the use of nets with a mesh size smaller than permissible during spawning periods and the fishing beyond sustainable yields. These practices are pursued due to high demand for fresh seafood in the market.
  - b) Loss of spawning grounds: Reasons for this could be mangrove deforestation, land reclamations and siltation. Short-term economic gains from the development of these areas is obviously preferred over the long-term benefits of the conservation of ecology.
  - c) Introduction of anthropogenic material: Any disturbance at any step in the marine food web may inadvertently affect other species. The introduction of untreated sewage and waste to the environment would give rise to toxic algal blooms wiping out many species<sup>22</sup>. Increased turbidity and sedimentation can also affect the benthic communities.
- Erosion: Dispersion of sediment load at any given point depends upon a number of parameters related to marine currents. Any activity which causes disturbances in these parameters, could alter the sites of deposition and result in erosion, accretion or siltation and changes in the ecology of that area, such as land reclamations, the extraction of sand or the construction of jetties<sup>23</sup>. Consequently, there are a large number of cases where coastal stretches have been subjected to the forces of erosion. Prime examples are Campal and Caranzalem near Panaji, Palolem, Agonda and many other places, where a considerable amount of construction activities have occurred<sup>24</sup>.
- Accretion/siltation: Accretion and siltation is occurring. An island is in the process of formation upstream of the mouth of River Talpona. Due to sand bar formation at the

<sup>20</sup> Field, C. 1995. *Journey amongst Mangroves*. International Society for Mangrove Ecosystems. Okinawa, Japan: John Witzig and Company, p. 140.

<sup>21</sup> *The Navhind Times*. 1997. "Goa's Fish Catch Shows Down Trend". 29 March.

<sup>22</sup> Madhupratap, M. and A.H. Parulekar. 1993. "Estuarine Biology and Management." *Environmental Impact on Aquatic and Terrestrial Habitats*, pp. 215-226.

<sup>23</sup> Carter, R.W.G. 1998. *Coastal Environments—An Introduction to Physical, Ecological and Cultural Systems of Coastlines*. London: Academic Press, pp 607; Nordstrom, K.F. 1994. Developed Coasts. *Coastal Evolution—Late Quaternary Shoreline Dynamics*. R.W.G. Carter and C.D. Woodroffe (Eds.) London: Cambridge University Press, pp. 477-510.

<sup>24</sup> Lobo, U. 1988. "Environmental Aspects of Silica Sand Mining from Coastal Sand Dunes." *Earth Resources for Goa's Development*, pp. 521-523.

mouth itself, which has been more pronounced in the last few years, the river is navigable only during high tides. In addition, local fishermen have noted siltation in the river bed. All these observations suggest disturbances in the natural sediment load dispersion patterns in the River Talpona.

### Impacts to the Land Part of the Coastal Zone

The land part of the coastal zone mainly comprises sandy areas along with the dunes and its vegetation cover. This part provides the following functions:

- To protect the coast from the forces of the oceans,
- To replenish the sand on the beach that is carried away by the sea,
- To gather the sand that is blown landward by the wind with the help of dunes and its vegetation, and
- To serve as habitats for numerous organisms, including turtles.

Sandy areas are also used for tourism development:

- To mix the sand with cement for construction purposes, and
- To develop the land.

All along the coastline of Goa, for example, between Chapora and Sinquerim in Bardez<sup>25</sup>, Caranzalem and Miramar in Panaji, Salcete Coast in Central Goa and in Galgibaga, Talpona, Palolem in South Goa, there has been a boom in construction activities, most of which are for tourism or for associated purposes. To make space for and to use them as a component of cement for construction, sand is being extracted in substantial amounts. When the environmental functions are weighed against the economic services that sand performs, the fact that the former are not priced, tilts the demand in favor of the economic user-groups. There is need to quantify and monitor such sand losses and their ecological impacts.

The following impacts have been observed on the coastal stretches of Goa due to development activities:

- Loss of sand dunes: Sand dunes have borne the brunt of construction activities along the coastal stretches of Goa<sup>26</sup>. Anjuna and Baga-Calangute-Candolim stretches in North Goa, and Salcete beaches comprising Betalbatim, Colva, Varca, Cavelossim and Mobor in central Goa, were the first beaches to lose their dunes. Our survey showed South Goa to be the next in line as in Galgibaga, two dunes, 10 meters high, have already been flattened into plateaus at half the heights to make way for construction.

<sup>25</sup> William, A. 1997. "Burgeoning Construction May be Epitaph to Queen of Beaches." *The Navhind Times*. 4 March, p 1.

<sup>26</sup> Lobo, U. 1988. "Environmental Aspects of Silica Sand Mining from Coastal Sand Dunes." *Earth Resources for Goa's Development*, pp. 521-523; Mascarenhas, A. 1990. "Why Sand Dunes are Needed." *The Herald*. 21 December, p. 4; Mascarenhas, A. 1996. "The Fate of Sand Dunes of Goa." *Voices for the Oceans*. International Ocean Institute of India, p. 111.

- Endangered species: Four species of turtles have been reported to frequent the beaches at Morjim, Miramar, Bogmalo and Palolem, covering almost the entire stretch of the Goan Coast<sup>27</sup>. The “Save The Turtles” campaign of the Goa Foundation, a local Non-Governmental Organization, carried jointly with the Forest Department of the Government of Goa, reported that the number of sea-turtles visiting their nesting sites on different beaches in Goa particularly in Morjim, is steadily decreasing<sup>28</sup>.
- Tidal ingress: The ceaseless mining of sand and sand-dunes have effectively razed gentle slopes of sand which stop the tides from rushing further on the shore. The consequent tidal ingress has reduced the area of beach at different places, such as Miramar in Panaji, Baga-Calangute-Candolim-Sinquerim stretch and Anjuna in Bardez, and in Salcete and Mormugao on the north and central coasts of Goa.

### Impacts of Recreational Activities

Recreational facilities affecting the coastal environment are generally, but not limited to, those related to upscale tourist activities. These are:

- Swimming pools: The water for this is invariably drawn from subsurface aquifers. The withdrawal of large amounts of ground water in a limited area can be detrimental to the water table of the region, particularly since it is a source of drinking water. Additionally, some parties owning wells with a good underground stream of fresh water sell their water at Rs.100 (US\$2.5) per 500 litre tank to fill these swimming pools. Consequently, the groundwater levels in some coastal areas is decreasing and is frequently accompanied with salt water intrusions. The manifestation of sea water intrusions in the form of salt water in wells along the coastal belt from Chapora to Aguada has been observed in coastal aquifer studies<sup>29</sup>.
- Water sports: Motor boats used in shallow coastal waters continuously disturb the habitats of endangered species and other marine life. Moreover, they tend to degrade water quality by the discharge of oil and grease.
- Beach driving: Tourists regularly drive on the beaches during low tide. Concrete ramps have even been constructed to take the vehicles on the beaches such as at Palolem.
- Beach accommodations: In the initial states of tourism in Goa, beach shacks became popular due to their small numbers, economical rates and simple decor; however, after several decades, these structures crowd the shorelines without any comfortable space among them, and they lack ecofriendly toilet facilities and proper refuse

<sup>27</sup> Gramopadhye, A. 1997. “Earth Day Special: Think Big.” *The Herald*. 21 April, p. 8.

<sup>28</sup> *The Navhind Times*. 1997. “Sea Turtles on the Run as Humans Take over Beaches.” Feb. 20, p 1.

<sup>29</sup> Kalavampara, G. 1994. *Preliminary Assessment of Salt Water-Fresh Water Interface between Fort Aguada and Candolim Coast, North Goa*. Msc. thesis. Goa University, p. 71; Carneiro J. R.L. 1996. *Use of Hydrochemical Techniques for Detection of Sea Water Intrusion in Coastal Aquifers between Fort Aguada and Fort Chapora, North Goa*. Msc. Thesis. Goa University, p. 130.

collection, all of which often result in waste invariably find its place in the coastal waters.

- Sanitation: Goa lacks modern treatment and disposal systems for both sewage and garbage. Even the internationally famous beach stretch of Baga-Calangute-Sinquerim, does not have rudimentary toilet facilities. Tourists, locals, shop owners and the hordes of migrant laborers, who are employed by construction companies along the beaches, have no other option than to use the beaches to answer the call of the nature.
- Beach litter: Plastics are among the very serious problems in a number of Goa's beaches, and an action plan is urgently needed to mitigate the problem<sup>30</sup>. Both the last mentioned problems could be solved through improved enforcement of regulations and infrastructural improvements.

### Impacts of Expanded Transport

Even though tourists in Goa are almost exclusively accommodated in coastal areas, they arrive and depart Goa by some kind of transportation operating in other areas of the state. While the air and sea travel would cause negligible damage to the environment in broad terms, motor vehicles cause air pollution by their uncontrolled exhaust fumes.

Also, the alignment of the Konkan Railway has broad reaching environmental impacts. The laying of the tracks for the railway in Goa, especially through wetlands and tidal marshes at Maxem and between Bali and Mayem along with numerous bridges on the Mandovi-Zuari estuarine fronts, has been done without proper hydrodynamic and geomorphological studies<sup>31</sup>. The gigantic embankments, several kilometers long, supporting the rail lines along the lowlands of Goa have lead to substantial alterations in physical, chemical, biological and geomorphological setups. Blocking, diminuting or increasing the tidal flow has resulted in a major redistribution of sediments giving rise to erosion/deposition or deposition/erosion with conspicuous changes in shorelines or near-shore realms. Mangrove swamps have been destroyed; tidal regimes disrupted; paddy fields flooded, and the embankments are sinking due to soft underlying strata<sup>32</sup>. A comprehensive analysis of the environmental impacts of the Konkan Railway alignment is needed to study such questions as the following. Is the siltation taking place in the backwaters and estuarine regions of Canacona in South Goa due to river runoffs carrying haphazardly dumped material from the digging out of the railroad? To what extent has the Konkan Railway Alignment through ecosensitive areas contributed to the environmental degradation of estuarine/coastal areas of Goa? In board terms, factors other than tourism could be responsible for the observations made above, but the contributions of the tourism industry in all these situation should be identified given the criticality of the coastal environment demands.

### **Tourism Policy**

<sup>30</sup> Alvares, C. 1993. "Fish, Curry and Rice: A Citizen's Report on the State of the Goan Environment." *Ecoforum*. Goa, p. 260; William, A. 1997. "Garbage, Vendors Turn Idyll into Nightmare." *The Navhind Times*. 3 March, p.1.

<sup>31</sup> *ibid*.

<sup>32</sup> Alvares, C. 1993. "Fish, Curry and Rice: A Citizen's Report on the State of the Goan Environment." *Ecoforum*. Goa, p. 260; Gadgil, M. and S. Chandran. 1993. "Konkan Lessons—A Railway Project and the Environment." *Frontline*. 26 March, p. 62; Mascarenhas, A. 1992. "Our Estuaries in Peril." *The Herald*. 20 April, p. 4; Mascarenhas, A., K. Sawkar and O.S. Chauhan. 1997. *The Coastal Zone of Goa: Then and Now*. Abstract 49. *Seminar on Coastal Zone Environment and Management*. Mangalore University, 12-14 February, pp. 50-52.

In the wake of the report, "Our Common Future", by United Nation's Commission on Environment and Development in 1983, India passed its own Environment Protection Act in 1986. This was followed by a Notification in February 1991, inviting the governments of India's coastal states and union territories to prepare Coastal Zone Management Plans for their respective territories. The much publicized Rio Summit in June 1992, along with Indian environmental norms, started a land race for coastal development regardless of the laws, regulations and conventions in vogue. The land race got started probably because the coastal resource users experienced inertia in the implementation of various legislation on the part of the authorities.

It seems increasingly clear that (i) despite several important pronouncements and regulatory mechanisms in place, local planning does not always adhere to guidelines and regulations and (ii) where it does adhere, planning and development regulations have been observed in the breach. Thus, the Government of Goa, in October 1988, published its Regional Development Plan, anticipating, among other activities, the growth of tourism by 2001 A.D. In this plan, a strategy is outlined<sup>33</sup>:

*"[The] location of new beach resorts should be considered not only from point of view of land availability but also from the consideration of beach resource ecology, based on the Environmental Assessment Studies. Further, spreading thinly on all available sandy beach stretches from Tlerekhol/Arambol in the north to Betul/Agonda in the south is not advisable from the standpoint of conservation of resources both natural and man-made. Instead, it is suggested that beach-head developments at certain selected centers should be encouraged."*

Despite these admirable commitments toward conservation and the protection of the coastal environment and ecology, the Regional Development Plan for Goa 2001 A.D. does not contain any reference to the "no development zone" of 200/500 meters from the high-tide line along the seashores, which had been much debated around the country in the early 1980s; nor does it mention the Environment Protection Act of 1986 of the Government of India<sup>34</sup>. Moreover, the Coastal Zone Management Plans, prepared by the Department of Town and Country Planning of Goa in 1995 and 1996 for approval by the Central Government, actually recommend tourism-related development for almost the entire length of the Goan coastline, barring only a few places, which contradicts the Department's own guidelines.

The current policies and relaxed enforcement thereof have led to the haphazard and uncontrolled growth of townships. Places like Calangute and Candolim in Bardez and Colva in Salcete have become over commercialized and haphazard in their development pattern. These areas have a number of unauthorized constructions, which have paid little heed to local planning rules, infrastructural supports or aesthetics. During the 1980s and the early 1990s, the lure of catering to tourists especially, international tourists and the hope of making rapid profits have led to considerable investment in resorts and apartments. Today there are signs of over investment, this is spreading a price war<sup>35</sup>. When a certain location is to be developed as a prominent tourist area requiring extensive infrastructural and other support services, it gets developed as a small township. This increases its real estate value manifold,

<sup>33</sup> D'Souza, J.A. et. al., 1988. *The Regional Plan for Goa, 2001 A.D.* India, Government of Goa, Department of Town and Country Planning, October, p. 108.

<sup>34</sup> India, Ministry of Environment and Forests. 1991. *The Gazette of India*. Notification: S.O. No. 114 (E), February 20.

<sup>35</sup> Wilson, D. 1997. "Paradoxes of Tourism in Goa. *Annals of Tourism Research*. 21 (1), pp. 52-75 and Wilson, D. 1997. "Strategies for Sustainability: Lessons from Goa and Seychelles" in *Sustainable Tourism*. M. Stabler (Ed.) Wallingford: CAB International.

inducing other sectors of the society to set up business and residences in these areas as well. A quick look at the developments along the coasts of Goa and the future plans for it, reveals that:

- i) these follow the ideas submitted in the CZM plan of Goa (which is yet to be formally approved) rather than its Regional Development plan; and,
- ii) the tourists are almost exclusively accommodated along the 105 km stretch of the coastline while little effort has been made to adhere to the regional plans of creating other types of tourism besides beach tourism.

One successful example of regulated tourism development is Seychelles, an island nation in the Indian Ocean. It spared its beaches from concretization and allowed resorts to come almost entirely amongst the coconut groves just behind the sandy stretches, taking care of the coastal marine environment<sup>36</sup>. This policy, unfortunately, is not in place in Goa where constructions are allowed as close to the waterline as possible.

## Conclusions

Although tourism is concentrated along the coastal zone in Goa, it has had a number of positive benefits in terms of increased incomes, increased employment, added avenues for upward mobility for locals, increased revenue and increased foreign exchange earnings. However, there are also some socio-economic and environmental impacts associated with these benefits that need to be highlighted. These impacts have arisen as a result of the trajectory that tourism has followed in Goa and can be summed up as follows:

1. The growth of coastal tourism has been rapid and uncontrolled.
2. The seasonal nature of tourism has led to swings in employment and income most markedly in the small sector and to the unskilled worker.
3. There has been no clear nor firm policy relating to tourism; most decisions have been on a purely ad hoc basis, except for a marked predisposition to upmarket tourism. The policy initiatives that have been introduced are not attentive to local concerns. This has led to some disaffection among locals toward tourists that needs to be studied.
4. There has been a marked spatial concentration of tourism development along the coast, which is leading to heavy demand for resources in these places. Cumulatively, this results in concentration and congestion of population, enormous increase in the density of construction, and related infrastructure and facilities. Consequently, there has been an overall decline in the agricultural sector in the state.
5. It poses major changes in land use, shortages of resources, such as land and water, and damage to coastal aquifers, the sand dune system, and mangrove vegetation.
6. Spawning and breeding grounds have been lost due to anthropogenic activities related to tourism; consequently, fish populations are decreasing and traditional fishing activities are on the decline.
7. The principles of sustainability and the norms related to the conservation of the environment and ecology are generally ignored; the coastal environment is becoming irreversibly degraded as evidenced by the concretization of beaches.

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<sup>36</sup> Wilson, D. 1997. *Strategies for Sustainability: Lessons from Goa and Seychelles in Sustainable Tourism*. M. Stabler (Ed.) Wallingford: CAB International.

It is clear that there is much to be learned about the impacts of tourism in Goa, and that further planning and development requires information gaps to be filled. More specifically, the following actions are needed:

1. A careful study on the type of tourism that best suits Goa: up-scale, low budget or a combination of the two.
2. Recognition that tourism is a vulnerable industry, subject to the fads of the trade; hence, tourism cannot be allowed to permanently change the face of the coast in the long run.
3. A systematic study of the environmental impacts of tourism, through perhaps, a life cycle analysis, and the valuation of the environment to enable its integration into decision-making.
4. An understanding of the processes that make the Goan coast a preferred tourist destination rather than the hills or the hinterland areas.
5. A monitoring and management system to ensure the effectiveness of coastal and environmental regulations. The development of sustainability markers would be a way to ensure this. Such markers will enable both the industry and government to identify the emerging issues and to facilitate mitigation before problems becomes unmanageable. They can also serve as the basis for monitoring changes in the ecosystem, social and economic spheres.
6. The integration of the principles of coastal environment and ecology into the planning stage of any coastal activity, as preventative rather than remedial measures.
7. An environmental impact assessment and studies of Goa's coastal stretches including estuaries and backwaters.
8. Policies which recognize the type of interconnections among tourism, local communities and the environment, to ensure that tourism contributes to a sustainable development agenda.

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#### **Authors' Acknowledgment**

The authors thank Mr. E. D'Silva, EDI of the World Bank, Washington, DC for requesting National Institute of Oceanography to contribute this paper. They are grateful to Dr. E. Desa, Director, National Institute of Oceanography, for permission to present it. Dr. L. Noronha wishes to thank Dr. A. Siqueira, Department of Sociology, Goa University, for insightful discussions on socio-economic aspects of tourism.

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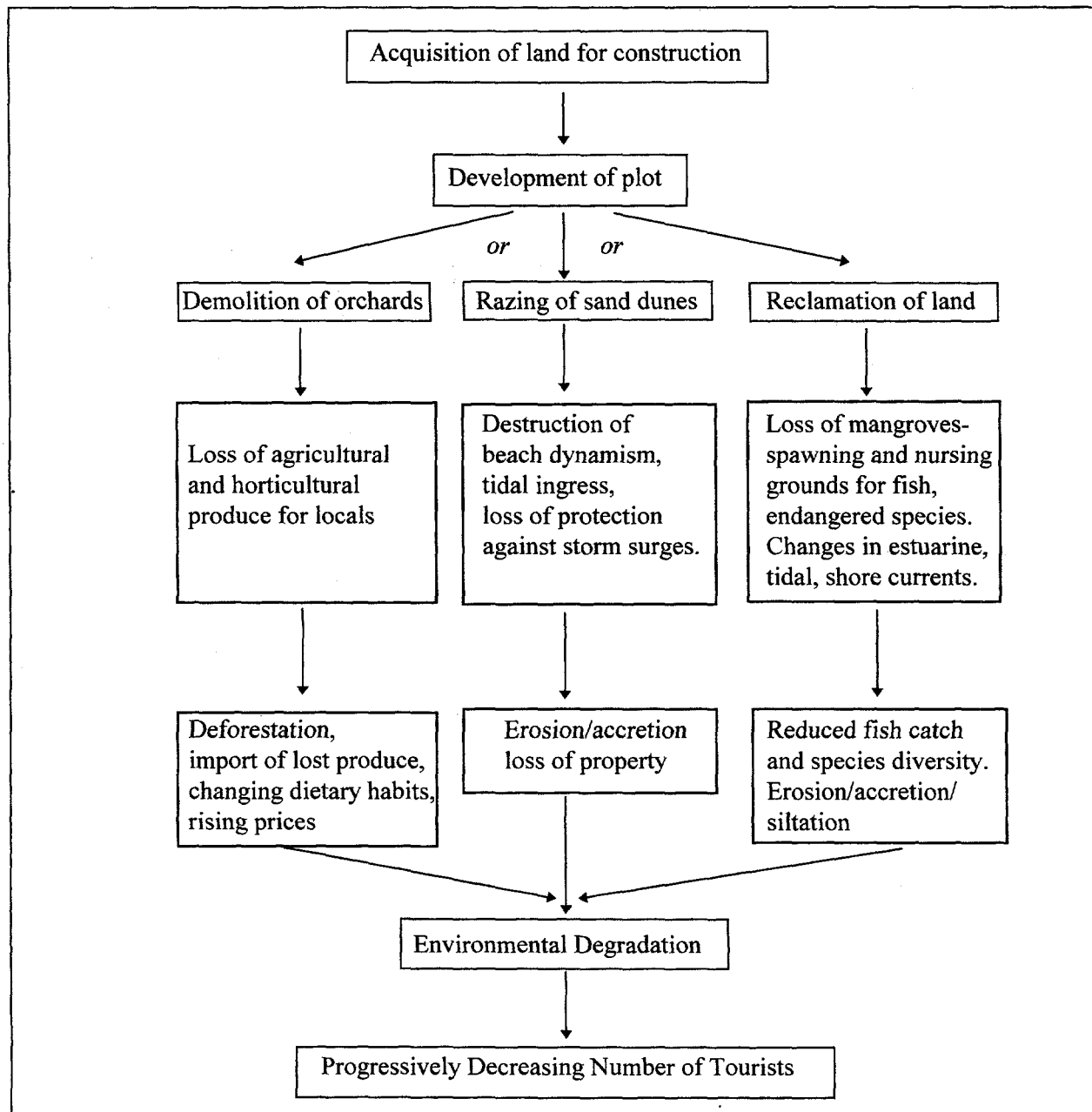
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## ANNEX

## IMPACTS OF CONSTRUCTION ACTIVITIES IN CLOSE PROXIMITY TO THE MARINE ENVIRONMENT

The field surveys undertaken during the survey of ecosensitive coastal areas of Goa show trends outlined in the flowchart depicted below:



Source: National Institute of Oceanography of India. 1996b. *Comments on the Coastal Zone Management Plans of Goa*. Report submitted to India, Ministry of Environment and Forests. New Delhi.

# ENVIRONMENTAL IMPACT MANAGEMENT IN THE TOURISM INDUSTRY OF MALDIVES

Simad Saeed

## **Introduction**

The aim of this paper is to assess the impact of tourism on the environment of Maldives and explore the environmental management practices in the tourism industry of Maldives. First, the emergence, growth and present status of tourism development in the Maldives is outlined. Then the environmental impacts of tourism are discussed. Next, the environmental management practices are outlined. The relevant legislation, institutional structure, tourism planning, standards and controls are also presented.

## **Tourism Development in the Maldives**

The Republic of Maldives is a small island, developing state consisting of 26 coral atolls dominated by the sea and is situated in the Indian Ocean, south-west of India. In total, these atolls contain about 1,190 very small islands of which only 200 are inhabited. The capital of the Maldives is Male', an island by itself, and the Male' International Airport also has an island (Hulhule) to itself.

Tourism development in the Maldives is based on the principle of isolation of tourists from the bulk of the indigenous population and the physical configuration of tourism development is an unusual one. In the Maldives, the "tourism industry" is synonymous with "resort islands" and each resort occupies a separate island and is totally self-contained. This isolation is practical because of the availability of a large number of uninhabited islands that can be developed into tourist resort islands.

According to a tourist opinion survey in 1991 conducted by the Ministry of Tourism, the main attractions in order of priority are white sandy beaches, opportunities for snorkeling and scuba diving among coral reefs and spectacular marine life, sunny weather, clear lagoons and scenic peaceful environments. The expectation is one of a "Robinson Crusoe" existence without any problems where the "Art of Doing Nothing" is practiced in a relaxing atmosphere.

## *Tourism History*

Maldivian tourism entered the international scene only in the early 1970s. Tourism commenced with the opening of two resorts in 1972 and about 1,000 tourists visited the islands. Until then the Maldives was virtually unknown to the tourist travel trade. By the late 1970, tour operators, notably from West Germany and Italy, started to feature the islands within their programs and international tourism had become an important source of income for the Maldives.

The first decade (1972-1982) in the development of the Maldives tourism industry evolved essentially in an unplanned laissez faire manner. Hulhule Airport was the basic and only gateway entry to the Maldives and the natural hub for tourism development. Thus the first two resorts to be developed were Kurumba and Bandos both on islands in close proximity to Hulhule Airport and Male'. In 1973, along with three other resorts, Club Med established itself on Farukolhufushi island, also only 20 minutes by boat from Hulhule Airport.

Tourism in Maldives originated from excursions from Sri Lanka and because of the reputation of Maldives as a diving destination. Tour operators identified the ideal combination of packaging the culturally-orientated product of Sri Lanka with the unique island paradise holiday of the Maldives. During the 1972-1980 period the market changed from the more limited and specialized divers' market to the much bigger mainstream market for beach holidays. With the growing importance of the mainstream market for sand, sea and sun holidays, the tour operators found that the market base was sufficient for introducing the Maldives as a separate destination.

With the completion of the runway at Hulhule's International Airport in 1981, direct charters from Europe, using wide bodied planes, flew in tourists. The expansion of air travel assisted by various promotional and other concessional fares on scheduled services, together with the rapid growth of charters, has helped the growth and development of the Maldives as a tourist destination.

In the beginning the facilities provided for tourists were basic. The room was furnished with just a bed and the essential cooling fan. Food with no exotic flavors was served by local people with no formal training, and scuba diving and island hopping were the only recreation facilities besides sun bathing and swimming. At present, a diverse range of facilities are offered at different resorts. At the luxurious end of the spectrum, public spaces have expensively tiled finished floors, vast varnished and carved timber frame roofs, elaborate light fittings and plush furniture, impressive reception areas, international cuisine, swimming pools, fountains, piped music and a lush landscape incorporating many ornamental imported species.

#### *Tourism Indicators*

Two resorts with a bed capacity of 280 opened in North Male' atoll in 1972. By the end of the first decade (1972-1982), 44 resorts became operational and bed capacity rose to just under 4,000. With the spatial policy shift towards opening of Ari Atoll, together with consolidation and upgrading of existing resorts, the next decade (1982-1992) saw the addition of 36 new resorts with over a doubling of bed spaces to reach a total of almost 8,500. By 1995, there were 74 resorts in operation in the Maldives.

During the year of inception of tourism in the Maldives, 1972, only 1097 tourists visited the Maldives. The number of annual tourist arrivals (reaching over 300,000 in 1995) now exceeds the total indigenous population of about 244,000. Europe is the leading generating market followed by the Asian market. Germany and Italy are the two main suppliers of tourists and in 1994, shared 40 percent of the total tourist arrivals to the Maldives.

In the late 1970s, international tourism became an important source of income for the Maldives. The readiness of the Maldives to develop its tourist sector can only be understood in terms of its very limited economic possibilities, especially the absence of local raw materials to diversify into exports of manufactures. At 17 percent of gross domestic product, which provides over 25 percent of the government revenue and contributes around 60 percent of the country's foreign exchange earnings, tourism is the second largest contributor to the economy and it is increasing in importance yearly.

#### **Tourism and the Environment**

Tourism depends on environmental quality more than any other activity and a central precept that has been preached in tourism is not to kill the goose that lays the golden eggs. Yet, in general, it is characterized by rapid, short-term development which more often than not damages the very environment the tourists come to enjoy and simply moves off elsewhere. Without careful attention to the balance

between the volume and type of tourist activity, and the sensitivity and carrying capacities of the resources being developed, tourism projects can be not only environmentally harmful but also economically self-defeating.

Tourism in the Maldives exists solely due to the physical and geographic features of the coral islands. The beauty of the underwater world at the reefs, clean water in the lagoons, white and pristine sandy beaches, a rich island vegetation and ideal tropical climate which form a virtual paradise that attracts tourists from Europe and Australasia.

### **Environmental Impacts of Tourism**

The first proper evaluation of tourism in the Maldives was carried out in 1983 after 10 years of tourism development. It was revealed that the pollution of the sea with garbage, piles of waste found in the resorts often close to the tourist cottages, the picking of corals, the use of spearguns were features present that did not fit into the tourists' image of the Maldives.

In 1991, after almost two decades of tourism development in the Maldives, the perception of impacts has changed. According to the present perceptions, the islands offer uncommon visual beauty unspoiled by human settlement, virtually unsurpassed marine environment and the strongest of all, unspoiled, under populated tiny tropical islands replete with natural beauty and abundant sea life.

The Environmental Protocol prepared in 1992 by the Ministry of Planning and Environment to determine the carrying capacity constraints in the tourism sector concluded that the natural resources of the Maldives are in a sufficiently pristine state, and of such high aesthetic quality, that a period exists in which environmental deterioration can occur without an adverse effect on tourism. However, concern was expressed that the duration of this period cannot be predicted and with increasing environmental pressures, rising environmental sensitivity, and without compensatory environmental management, adverse effects may be felt sooner than later.

According to a survey carried-out in August 1995 involving the management of 47 resorts, beach erosion was identified to be the major existing environmental problem facing the resorts. The highly dynamic Maldivian beaches erode and build in response to wave action associated with storms, the tidal cycle, and the monsoons. The results of a survey carried out in 1992 showed that 12.8 percent of the total shoreline of 32 resorts surveyed consists of seawalls and groynes and is not sandy. The same survey also showed that 12 of the 32 resorts surveyed (38 percent) had offshore breakwaters to protect the beach. The maintenance of natural beach is of paramount importance to attract clients to the resorts and the construction of artificial structures designed to control and limit beach erosion are not only unsightly but also expensive.

Rubbish on beach is the next environmental problem identified by the resort management. Rubbish on beach mainly results from waste dumped at sea irresponsibly by neighboring resorts and inhabited islands that get washed ashore onto islands with the current and to some extent from the messy habits of certain tourists. The resort management is quite emotive on this issue as this is one issue that will reflect very badly on the image of the resort environment.

### *Solid Waste*

Solid waste disposal is one of the most obvious impacts of tourist resort operation and one of the easiest environmental management problems to deal with and thus has been addressed in a number of reports on tourism development in the Maldives. The pollution of the sea with garbage and piles of waste found in the resorts often close to the tourist cottages were identified in 1983 among features that was not aesthetically pleasing. In 1985 the Department of Tourism reported that the disposal of non-biodegradable waste was then a serious problem and that there was need for education to increase environmental awareness, and for the use of re-cycling technology.

In the new Tourism Master Plan solid waste is identified as a major issue for resort islands and it is stated that at current tourism levels, problems are probably more aesthetic than environmental. The plan also points out that while solid waste itself may not currently pose a serious environmental threat, its impact in conjunction (e.g., synergistically) with the effects of other human activities should be considered.

### *Sewage Disposal*

In 1980 only two resorts were reported as discharging saltwater flushed toilets to the open sea. In a survey of methods of sewage disposal reported from 34 resorts in 1992, 23 resorts disposed sewage into the ground while 11 discharged sewage to the sea.

A survey in 1993 revealed that at 67 percent of tourist resorts sewage effluent is piped into septic tanks, and the untreated sludge is dealt with by natural processes and soil absorption. At 33 percent of the resorts analyzed, septic tanks and sea outfalls were the reported practices. Measures to protect the environment in cases of direct sewage discharge include the siting of outfall pipes 100m from the island and 30m below mean sea level.

Sewage disposal has both health implications and environmental consequences. Aquifer contamination by faecal coliform bacteria or the contamination of bathing waters could give rise to health problems. Since a very small percentage of resorts pump sewage into the sea and even so, these resorts have a very small population it might be concluded that the current levels of sewage emission into the coastal waters of the resorts do not pose very serious problems to human health. The capacity constraints survey carried out in 1992 showed that the sewage discharges from resorts are relatively small and the observed effects were limited. Even though the volume of waste matter disposed is quite small, nutrients from sewage could build up over time, especially if the process of discharge is not managed well. However, volumes of water and rates of water exchange are large and in view of the productive fisheries, the atolls are probably already subject to relatively high nutrient input from upwellings as oceanic currents hit them.

### *Groundwater*

There is an increasing move away from using groundwater as a resource in tourist resorts. Drinking water in tourist resort comes from rainwater which is collected on roofs and stored in large tanks and is now supplemented by desalinated water and imported bottled mineral water. There has also been a move away from the system in which groundwater was used for showering and flushing toilets to one in which saltwater is used for flushing with the wastewater pumped out to sea and desalinated water used for showering.

Groundwater quality deterioration could be caused through increasing abstraction of groundwater which depletes the already thin freshwater lenses; salt water intrusion into the freshwater aquifer; and contamination of groundwater from sewage discharges. In addition to sewage, groundwater can also be contaminated through the use of contaminated soils; the excessive use of fertilizers; the use of pesticides; and inappropriate solid and liquid waste disposal.

An analysis of groundwater quality and pollution in tourist resorts, based on the results of Maldives Water and Sanitation Authority Surveys and consultants' opinions showed that groundwater quality in the resorts is deteriorating. However, the capacity constraints study in 1992 concluded that whilst there is some evidence that groundwater quality has deteriorated on some resorts through tourism, the deterioration is not significant and is unlikely to be irreversible. The study also suggested a number of factors mitigating any possible deterioration and they are:

1. The sources of pollution are relatively benign though more and more pesticides are being used and rubbish buried on islands.
2. High rainfall backed up by evidence that salinity varies widely on many of the islands between the wet and dry season indicates that flushing rates, and oxidation, of contaminants are likely to be rapid.
3. Before upgrading, resorts traditionally used groundwater flushing for toilets and for showering, this minimizes the historic loss of groundwater.
4. The contaminant adsorption properties of coralline soils are generally extremely limited. One advantage of this is that any contaminants should be flushed out eventually. This is good for the state of the groundwater but not so good for adjacent lagoon waters.

### *Coral Reefs*

On tourist resort islands reef damage has been caused by scuba divers, and by snorkelers and bathers walking out across the reef flat. The greatest threat at present almost certainly arises from snorkelers and bathers, from both inadvertent breakage and deliberate removal of coral and coral fauna for souvenirs. A study at Kurumba Village has assessed the effects of snorkelers on the reef flat/crest at depths up to about 1.5 m. Results indicate breakage of 18 percent of all *Arcopora* corals/month. Hence most or all coral colonies of this genus stand to get broken each year, suggesting a significant effect from snorkelers.

The present evidence on reef degradation from sewage in the Maldives is inconclusive. The Environment Protocol reported that none of the 32 resorts surveyed in 1992, and none of the 70 dive base operators on 41 resorts, identified sewage as a problem causing reef deterioration. Direct and indirect damage to reefs is also caused by divers and tourists' demands. However, the greatest impact to reefs in the Maldives has originated from coral mining for construction purposes.

### *Island Vegetation*

The image of a palm fringed sandy beach and lush tropical vegetation is integral to the perception of, and satisfaction, with Maldives as a tourist destination. At present there is no requirement to survey and consider the vegetation of an island as part of the planning approval process prior to resort development. In the construction process trees and shrubs are cut down and coastal vegetation is

removed. Exotic ornamental and fast growing species are imported to replace the vegetation removed and for new resort gardens. The introduction of exotic species not only reduces the ability of the island to recover to its natural state but also the exotic species may overcome local ones directly or through the introduction of pests.

There is also the matter of maintaining the natural perception of the island for marketing purposes. Whilst the palm is the most important vegetation feature on an island, there are local plants that have historic and cultural importance and so have marketing value which imported exotics do not have.

Soil and fertilizer have largely been imported to improve the growth prospects of exotic imports. These imports are very much on trial and error basis and there is little doubt that many soils and a variety of fertilizers have been tried. This process detracts from efforts to use local vegetation which is already adapted to local conditions, and so should not have to be sustained artificially. Imports may also introduce soil associated pests and diseases for which local plants have limited resistance.

## **Environmental Management**

### *National Legislation*

The Department of Tourism and Foreign Investment was organized in 1978 and made responsible for supervision, co-ordination and maintaining standards of tourist services in the country. To develop and regulate tourism, and simultaneously to strengthen the institutional framework for administering and monitoring the industry, this department was renamed the Department of Tourism in November 1982 and made solely responsible for tourism management. In 1984, the Tourism Advisory Board was established as a consultative body affiliated to the tourism authority.

The tourism sector was given elevated status in 1988 with the establishment of the Ministry of Tourism, according to the designating law 3/68 J under 1/69 J as at 1993, to provide ways to develop the tourism industry in the Maldives, to plan methods of income generation through tourism, to provide guidelines, and to administer the industry.

The Ministry of Planning and Environment was established in 1988. This Ministry is responsible for the formulation of policies on environment, environmental guidance to other development sectors, the implementation of environmental impact assessment and the designation of protected areas.

### *Policy and Planning*

During the first decade of tourism development, there was no specifically planned development; rather, tourism took place according to individual private sector initiatives in locations that offered market advantages principally related to the access opportunities offered by Hulhule Airport. This essentially informal development managed to generate almost 3,500 bed spaces of international quality and the industry was achieving enviable occupancy rates of up to 80 percent in the high season.

The first formal initiative to plan, in an integrated way, the future development of the tourism industry in the Maldives, came when the Department of Tourism and Foreign Investment commissioned Dangroup International in November 1980 to carry out a Maldives Tourism Development Plan. This long-range (10 years), tourism development plan was prepared for the Maldives in May 1983 and some, but not all, of its recommendations were considered feasible for implementation.

The tourism plan provided some ideas for development. However, to date, most of the tourism planning and management has resulted from government initiatives, based on its evaluation of the best forms and standards of development. Many of the government's present approaches and standards have evolved through the monitoring of the earlier phases of development to determine what is most suitable. Approaches and standards have been refined—and some abandoned—based on the experience gained from previous types of development.

By government policy, the resorts are located on uninhabited islands, in order to reduce any possible socio-cultural impacts. Also most islands are too small to contain both resorts and traditional villages. These islands are owned by the government and it can allocate them for resort use as needed. The resort developer receives a long-term lease and pays an annual rent that is calculated individually for each island. The resorts must supply their own infrastructure of electric power, water supply, sewage and solid waste disposal, boat dock and recreation facilities. They must also provide housing and related facilities for the resort employees. The families of the resort employees remain on their home islands, often some distance away.

The government policy has been to expand tourism for its economic benefits, but in a systematic manner of staged development. In the late 1980s, Kaafu Atoll was considered saturated with resort development. This decision was made within the framework of maintaining high environmental standards for the existing resorts, and retaining sufficient land for village and urban expansion and recreation parks.

All new resort development was then programmed to take place in Alif Atoll, which is accessible by sea and air from the international airport. In parallel the government policy turned to encourage expansion and upgrading of existing resorts to higher standards, including meeting present environmental quality standards. This upgrading was considered necessary to maintain the viability and competitiveness of these resorts and to maintain all tourism development at a reasonably high level, catering to quality tourist markets. As an inducement to achieve these objectives, resort leases were extended from 10 to 21 years and much of this upgrading has been accomplished.

The Third National Development Plan (1991-1993) recommended the development of a ten-year zoning plan (1991-2000). Under strategies and policies to achieve the main objectives of tourism development, the NDP (1991-1993) included a proposal to assess environmental impacts of resort developments and operations, and further strengthen measures taken to protect and conserve the environment and natural setting for tourism, and to adopt remedial measures on environmental degradation.

The issues that are examined in the new Tourism Master Plan draft include new markets, priority markets, air travel and other transportation issues, tourism infrastructure development, legal aspects, human resource development, gender situation, socio-cultural aspects and environmental impacts.

### *Environmental Impact Assessment*

The Environmental Protection and Preservation Act of Maldives (4/93) provided the basic framework for the Environmental Impact Assessment (EIA) process in the Maldives and under Article 5 (1) of the Act, an impact assessment study shall be submitted to the Ministry of Planning, Human Resources and Environment (MPHRE) before implementing any activity that may have an impact on the environment. According to the EIA guidelines issued by MPHRE all new resort developments require an EIA study before approval for development can be made.

### *Carrying Capacity Limits*

As an important basis for deciding the number of rooms and extent of resort facility development allowed on each resort island, the government has established carrying capacity standards. These are based on several factors. The cutting of trees is controlled so that the natural appearance and facade of the island are maintained and no buildings are allowed to appear above the tree tops. The maximum area of the island to be occupied by buildings is 20 percent, with two story buildings allowed to conserve land area if there is sufficient vegetation to conceal these buildings from the ocean view.

To preserve the tourists perceptions and image of beach orientation, all guest rooms should be facing the beach, with a minimum of 5 meters of linear beach available in front of each room. Only 68 percent of the beach length can be allocated to guest rooms as 20 percent has to be allocated to public use and 12 percent left as open space.

Construction on reef flat and lagoon are discouraged; however, as over water bungalows are very popular among tourists, they are permitted provided that equal open space is left on the land for each building developed on the lagoon.

### *Architectural and Design Controls*

The design of resort buildings is controlled so that they are well integrated into the island environment, take advantage of the tropical climate and use local building materials to the extent possible, such as thatch roofs. Previously many buildings were constructed from coral mined from the reefs. However, the use of coral is now restricted and use of imported materials is now encouraged, although these are expensive by local standards. Coral and sand mining from resorts and their house reefs is strictly prohibited.

Hard engineering solutions for dynamic coastlines are discouraged and construction of solid jetties and groynes are controlled. Design of boat piers and jetties should be in such a way that they do not obstruct the original flow of currents or disrupt the wave climate within the lagoon.

### *Biodiversity Conservation*

To protect and preserve marine biodiversity a number of measures have been prescribed. Spear, poison and dynamite fishing are strictly prohibited. Net and trap fishing are controlled and confined to certain areas. Removal of shells, juvenile lobsters and lobsters ready to lay eggs are strictly prohibited.

The catching of turtles is strictly prohibited and trade in all turtle products is banned. The commercial exploitation and export of a number of other species is also banned. Resort operators also voluntarily prohibit the catching of reef fish from the house reef or tourist resorts. Fifteen important dive sites have been declared as protected areas in 1994, where fishing, anchoring, removal of coral and other destructive activities are prohibited.

The Ministry of Tourism recognizes the importance of vegetation in maintaining the natural beauty of the islands and there are a number of regulations which aim to secure this resource. These include a limit of 20 percent of the islands for building, the requirement that no buildings be put up that disrupt the natural facade of the island, that there be a minimum setback limit of 5 meters from the vegetation line of the island, and that no buildings should appear above the tree tops.

### *Waste Disposal*

According to the regulations issued by the Ministry of Tourism, garbage from tourist resorts should be disposed off in a manner that would not cause any damage to the environment. All garbage disposed into the sea should be done as far away into the sea as necessary in order to ensure that it does not get washed onto any islands with the current. Tourist resorts are required to have incinerators and compactors adequate in size to burn all flammable materials and crush all the cans respectively. Those who lack these facilities are not allowed to operate. Plastic or polythene bags should not be thrown into the sea and such material should be burnt. Those who contravene these regulations are subject to fines and penalties.

Two airlines have joined in the effort to keep Maldives clean by arranging for waste to be carried back to Europe. Under this program all tourists who fly in to the Maldives in these airlines are given a bag and asked to bring to the airport, all the waste they produce during their stay in the Maldives when they depart. The airlines carry the waste to the original destination for recycling free of charge.

Under sewage and excreta disposal the tourism book of regulation specifies that the sewage system should be prepared such that pollution of water supplies, beaches and other areas are prevented; nuisance, ugly sights, and unpleasant odors do not occur, human wastes do not come into contact with people, animal and food; and breeding of flies and mosquitoes will be prevented.

## **Conclusion**

Tourism in the Maldives began in 1972 and it then evoke the image of a lost paradise. The tourism industry of the Maldives is dependent entirely on environmental quality and since it established itself in the tourism market it has maintained its strong position in a rapidly growing market. A few critics in the 1980s proclaimed that environmental pollution had begun to rear its ugly head in the Maldives. However, the natural resources of the Maldives are still in a sufficiently pristine state and of very high aesthetic quality and environmental concerns are few.

Environmentally unsound practices in solid waste and sewage disposal pose the most serious threat from tourism to the delicately balanced coral reef ecosystem of the Maldives. Though solid waste is a cause of environmental concern, at current level it is more of an aesthetic problem. In the past the portion of waste and garbage which could not be burned was dumped into the sea. This practice is now prohibited by law and waste incinerators and crushers have to be used in all resorts. Sewage effluent is discharged into the sea by the resorts. However, their discharges from resorts are very small and the evidence on reef degradation from sewage discharges is inconclusive. Some of the resorts are turning to the latest technology in sewage treatment using UV radiation to produce virtually pure water.

The Maldives has developed a very suitable form of tourism, appropriate for the small island environment. The present form of tourism development has not generated any serious environmental impacts. This has been accomplished through careful management. The government has developed appropriate policies, legislation and plans and instituted mechanisms to apply strict standards and regulations.

## **About the Author**

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