

durante a fase de intensificação do vento, e enquanto a componente paralela à costa (vento norte) se mantém superior a 5 m/s, as concentrações mais elevadas de clorofila se observam na periferia dos filamentos de água aflorada das camadas subsuperficiais, consequência das velocidades horizontais menos intensas aí observadas, tipicamente dirigidas para a costa e da manutenção da estratificação térmica nessas áreas (Fig. 1). A rápida re-estratificação da coluna de água e o estabelecimento de correntes dirigidas para a costa e para norte quando a intensidade do vento diminui (Fig. 2), provoca uma alteração na localização dos máximos de clorofila que passam a estar na mesma posição que os mínimos de temperatura.

A forte semelhança entre as distribuições da temperatura superficial obtidas a partir das imagens de satélite e a partir dos resultados do modelo, permitiu identificar quais as condições oceanográficas que se verificam nas áreas com maiores concentrações de clorofila: (i) temperatura superficial inferior a 16.5 C, (ii) profundidade da camada de mistura inferior a 30 m e (iii) velocidade horizontal integrada na camada de mistura inferior a 0.30 m/s (Fig. 2).

Os resultados do modelo Lagrangeano acoplado ao modelo hidrodinâmico permitiram identificar a origem das partículas que se encontram na camada de mistura, em regiões de elevada concentração de clorofila, em contraste com as partículas que se encontram nas regiões com camada de mistura superior a 30 m (Fig. 3, em baixo à direita). Verificou-se que as elevadas concentrações de clorofila observadas na baía de Lisboa e a sul do cabo Carvoeiro estão associadas a células de circulação ciclónica, caracterizadas por uma advecção horizontal relativamente reduzida (especialmente quando comparada com a advecção observada nos filamentos) e afloramento de profundidades abaixo da camada de mistura.

References

- Moita, M.T., A.M. Silva, A.S. Palma & M.G. Vilarinho, 2008. The coccolithophore summer-early autumn assemblage in the upwelling waters of Portugal: patterns of mesoscale distribution (1985 - 2005). *Journal of Plankton Research* (submitted).
- Oliveira, P.B., M. T. Moita, R. Catarino & A. Jorge da Silva, 2007. Wintertime SST and Chl-a off NW Iberian shelf from satellite and in-situ data; EUMETSAT/AMS Satellite Conference; Amsterdão, Holanda, Setembro 2007.
- Oliveira, P.B., M.T. Moita, A. Silva, I. Monteiro & A.S. Palma, 2008a. Summer diatom and dinoflagellate blooms in Lisbon Bay from 2002 to 2005: pre-conditions inferred from wind and satellite data; *Progress in Oceanography*; no prelo.
- Oliveira, P.B., R. Nolasco, J. Dubert, T. Moita & A.J. Peliz, 2008b. Surface temperature, chlorophyll and advection patterns during a summer upwelling event off central Portugal; *Continental Shelf Research*; doi:10.1016/j.csr.2008.08.004
- Palma, S., H. Mourinho, A. Silva, M. Barão & M.T. Moita, 2008. Can *pseudo-nitzschia* blooms be modelled by coastal upwelling in Lisbon Bay? *Harmful Algae* (submitted).
- Ribeiro, S. & A. Amorim, 2008. Environmental drivers of temporal succession in recent dinoflagellate cyst assemblages from a coastal site in the North-East Atlantic (Lisbon Bay, Portugal); *Marine Micropaleontology*, 68, 156-178; doi:10.1016/j.marmicro.2008.01.013.
- Silva, A., S. Palma, & M.T. Moita, 2008a. Coccolithophores in the upwelling waters of Portugal: Four years of weekly distribution in Lisbon bay. *Continental Shelf Research*, 28, 2601-2613, doi:10.1016/j.csr.2008.07.009.
- Silva, A., S. Palma, P.B. Oliveira & M.T. Moita, 2008b. Long-term phytoplankton distribution and composition – four years of weekly sampling in Lisbon Bay (Portugal); *Continental Shelf Research* (submitted)
- Silva, A., C.R. Mendes, S. Palma & V. Brotas, 2008c. Short-time scale variation of phytoplankton succession in Lisbon bay (Portugal) as revealed by microscopy cell counts and HPLC pigment analysis. *Estuarine, Coastal and Shelf Science* 79: 230–238, doi: 10.1016/j.ecss.2008.04.004
- Silva, A., S. Palma, P.B. Oliveira, M.T. Moita, 2008d. *Calcidiscus quadriperforatus* and *Calcidiscus leptoporus* as oceanographic tracers in Lisbon bay (Portugal). *Estuarine Coastal and Shelf Science*, no prelo.
- Silva, A.M., A.S. Palma & M.T. Moita, 2008e. The coccolithophore summer-early autumn assemblage in the upwelling waters of Portugal: II. High frequency distribution at Cascais bay. *Journal of Plankton Research* (submitted)

Tourism, environment and sustainable development. Local strategies for improving rural livelihoods in Bahia (Brazil) and Goa (India)

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Due to its scale and geographical scope, tourism industry is a major driver of both biophysical and social changes. It is an important factor in the economy of many countries and in the management of many cultural sites and natural areas. Being a people-oriented industry, tourism also provides many jobs which have helped revitalize local economies. Yet by its very nature tourism is ambivalent, generating well-known problems as well as well-known benefits.

1. Introduction

In 1993, the United Nations Statistical Commission adopted the following definition of tourism: "Tourism comprises the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes".

Tourism is nowadays one of the world's largest industries. Measured through the number of international arrivals it is possible to see, in the period 1950-2004, an average annual growth rate of 6.5%, when it grew from 25 million to 763 million (WTO, 2006). Furthermore, long-term estimates of WTO forecast that, by the year 2020, 1.56 billion tourists will visit foreign countries annually (WTO, 2000). These figures represent a threefold increase within a generation. Worldwide, tourism generated in 2004, annual receipts of about 623 billion

dollars, making it the world's largest industry (WTO, 2005) that generated, directly and indirectly, about 10.4% of world's GDP and about 8.7% of total employment (WTTC, 2006). This activity has a strong importance for every country in terms of job creation, halting emigration, the contribution made by foreign currency to the balance-of-payments, and the share of the gross domestic product.

For many countries, both developed and developing, tourism is a very important source of foreign currency earnings and employment. However, the differences among regions are significant: 52.5% of all receipts are earned by Europe, while America has a share of 21.1%, Asia and the Pacific 20.1%, Africa 2.9%, and Middle East 3.4% (WTO, 2005). While small relative to world totals, the receipts from developing countries are significant in their national economies in terms of foreign currency earned, income generated and employment created.

The expected growth in the tourism sector and the increasing reliance of many developing countries on this sector as a major employer and contributor to local, regional and national economies highlights the need to pay special attention to the relationship between environmental conservation and protection and sustainable tourism (UN, 2001). In fact, tourism-generated threats are now felt in many developing countries which lack the technological or financial capacity to handle tourists' resource consumption and waste generation – often far greater than those of the home population.

Environment is in the core of tourism development, which was seen during long time as the ideal smokeless industry, an activity inherently conservatory given that its sustainability relied on the preservation of the natural resource base and the local cultures. However it is now recognised that tourism is an industry just like any other, an industry which has been characterised by rapid, short-term ventures which have often damaged those very assets upon which they depend. "Tourism kills tourism" is acknowledged as a widespread phenomenon (WTO, 1999).

Tourism is the strategy employed either by public agencies or private companies to promote a particular region for the purpose of providing goods or services to facilitate business, pleasure, and leisure activities away from the home environment (Mill & Morrison, 2002). It requires travel, which is the action someone undertakes to visit that region located outside of one's normal working or living area, from daytrips to overseas holidays.

Therefore, tourism is a service industry, comprising a number of concrete components (transportation systems, accommodation, foods and beverages, tours, souvenirs; and related services such as banking, insurance and safety & security) and insubstantial components (rest and relaxation, culture, escape, adventure, new and different experiences).

At present, tourism (especially mass tourism which requires the increasing development of hotels, and related facilities) is one of the main drivers of environmental degradation (especially in what concerns to natural resource consumption and waste generation), inducing changes in geomorphology and hydrology, increasing pressure on water resources and food supply, leading to the destruction of fragile habitats such as coral reefs and mangroves, increasing pressure on a variety of species, and introducing serious pollution problems through the production of sewage and solid waste. Moreover, tourism has also led to changes in local communities. Although providing many jobs that can contribute to revitalise local economies, tourism introduces these local communities to new consumption models and lifestyles, often undermining local traditions and social frameworks.

Tourism enterprises are in the business for profit, and tourism is essentially an exploitative industry. Therefore, it is justified to regulate tourism, towards sustainability, as is done for any other polluting industry. In fact, projects that are economically feasible but not environmentally desirable should remain unbuilt. Nevertheless, this industry has also the power to enhance the environment, to provide funds for conservation, to preserve culture and history, to set sustainable use limits, and to protect natural attractions. Furthermore, WTO (2002) considered that sustainable tourism development is a top priority in the strategies to reduce poverty and in its recent Tourism Policy Forum¹, held in Washington; it was considered that tourism is an increasingly important development strategy to positively address poverty reduction, economic growth, and biodiversity

conservation, as well as the UN Millennium Development Goals (MDGs).

The complex nature of tourism and its effects make it difficult to gain complete knowledge of this phenomenon. Nevertheless, as social and ecologic aspects converge in tourism, we should opt for an integrating scientific approach. This approach can be achieved by gaining territorial knowledge of tourist dynamics, and should take into consideration existing infrastructures, as well as their integration at regional and even international level. In fact, much of the tourism activity of a particular territory depends upon the fluctuations in tourist destinations provided by the world market, which has gained increasing significance in present days due to the growing tendency for globalization in economy.

Therefore, despite of the increasing economic, social and territorial significance of tourism activities in the world, upon which certain countries rely to fuel their economies, they are subject to some factors (political, social, environmental, economic, and technological) that frequently are far beyond the control of tourism suppliers, wholesalers, or operators (Brandon, 1996).

2. Tourism as a driver of global change

The origin of the tourism phenomenon has been analysed by authors from different disciplines. The reality underlying mass tourism in present days is no more than the result of a wider stratum of population in developed countries absorbing the ideological aspirations of the dominant class, which in the 18th and 19th centuries gave birth to the concept of tourist journey during times of leisure. The Grand Tour of the British aristocracy, spas, nature, and fishing are ideas which spring from the ways of living of the leading classes. A specific social demand appears, composed of aspirations which progressively come to be assumed as needs, resulting in a set of mental representations (images and speech) whose duration in time give rise to a spatial myth, serving as reference to the less-favoured classes. This myth essentially feeds on the quest for spatial alternatives, for the search of the other, and stands upon the passion for nature, the recreation of rural space as the expression of the anti-city (Soneiro, 1993).

Improvement of income and increase of the power of consumption, as well as the reduction of working hours and the extension of the period of paid holidays, the "democratisation" of public and private means of transportation, in short, the improvement of the standard of living felt in the last decades has brought about a significant growth in terms of spatial mobility for purposes of leisure.

Tourism as an industry appeared when large numbers of middle-class people began to travel as well. As societies became wealthier and people lived longer, it became not only possible but also probable that lower-middle and middle-class people with steady employment would retire in good health and with some significant savings. Tourism, like any other form of economic activity, occurs when the essential parameters come together to make it happen. In this case there are three essential parameters: disposable income, i.e. money, to spend on non-essentials; time in which to do so; and means of transport and infrastructure in the form of accommodation facilities.

Tourism as a driver is here understood as one force of environmental change, which constitutes the underlying causes and origins of pressures on the environment. Its impacts on population, economy and ecosystems describe the ultimate effects of changes of state in terms of damage caused. Tourism as a group of combined activities dynamizes local economy (services, transportation, construction, related industry) and is the key to organizing space and society. It has a multitude of impacts, both positive and negative, on people's lives and on

¹ This forum was held in October 2004, under the subject of "Tourism's Potential as a Sustainable Development Strategy for Least Developed Countries". In this forum was approved the Washington Declaration on Tourism as a Sustainable Development Strategy, which called upon donors and recipients to join together with government, the private sector, universities and civil society stakeholders to form a global network to enhance tourism's potential to contribute positively to the fulfilment of the Millennium Development Goals.

the environment, an impact which is associated with the changes it brings about the resource that it uses; the local space that it comes to appropriate and the local dynamics that it generates.

All the segments of a tourist market (Adventure, Well-being, Cultural, Sport, Study, Incentive, Research, Professional, Rural, Coastal, Mountain, Ecotourism, etc.) act upon space and natural resources, causing more or less intense impacts, mainly depending upon the greater or smaller number of tourists associated with the space in question. Nevertheless, from all territories where larger pressures can be noticed as a result of tourism activities, the areas which stand out most are coastal areas, mountain areas and urban areas, specially those where built patrimony bears a very attractive cultural interest.

The analysis of the evolution of spatial distribution of tourism activity reveals two characteristics which are unquestionable: the irreversible growth of leisure activities within the range of tourism and the almost exclusive leadership of industrialized countries, in which tourism has been converted into almost a need, in order to stimulate the growth of their economies.

In fact, spatial and socio-economic impact of tourism activity has been quite significant in some regions: tourist activity has brought about changes in the economic structure, stimulated industrial sectors in crises situations, contributed to the growth of the service sector, altered the physical environment, consumed natural spaces and agrarian landscapes, caused changes in the spatial distribution of population, labour and income.

2.1. Tourism and economic change

The positive economic impacts of tourism related to foreign exchange earnings, contributions to government revenues, and generation of employment and business opportunities, are the main reason why tourism is strongly supported by governments. Especially in developing countries, one of the primary motivations for a region to promote itself as a tourism destination is the expected economic improvement resulting from the foreign currency inflow, which is an important factor for the balance of payments of many host countries, and often perceived to be "passports to development" (de Kadt, 1979). Other positive impacts arise from stimulation of infrastructure investment, such as better water and sewage systems, roads, electricity, telephone and public transport networks, all of which can improve the quality of life for residents as well as facilitate tourism. Tourism can be a significant, even essential, part of the local economy. In certain regions, the tourism is so important to local economies that can be difficult to deal with the impacts when it is disrupted.

However, tourism can have unfavourable economic effects on the host community, many of which are hidden costs. Although, the least developed countries have the most urgent need for income, employment and general rise of the standard of living by means of tourism, often they are least able to realise these benefits from tourism than the developed countries. Among the reasons for this are large-scale transfer of tourism revenues out of the host country and exclusion of local businesses and products. According to UNEP (2002), another negative aspect of tourism's economic boom is that: tourism pays 20% less than average employers in other areas; 13-19 million children are employed in the industry; and displaces resource use and labour force from traditional occupations.

Also the production of tourist goods and services requires commitment of resources that could otherwise be used for alternative purposes (Cooper et al, 1998). Furthermore, in many developing countries much of the income from tourism expenditures leaves the country again to pay for the imports necessary to satisfy tourist needs in terms of labour force, equipment, food, and other products that the host country

cannot supply. According to UNEP (2002), the average import-related leakage for most developing countries today is between 40% and 50% of gross tourism earnings for small economies and between 10% and 20% for most advanced and diversified economies.

Moreover, external investment is also responsible for decreasing the amount of earning in the tourism destination countries, because external investors tend to take their profits back to their country of origin.

Other unfavourable economic effects of tourism activity are related with (UNEP, 2002): "all-inclusive" vacation packages, which reduce the income prospects of local businesses, which otherwise thrive on tourism related activities; infrastructures costs for tourism development can appropriate a major portion of the state budget thereby diverting or reducing government investment in education/health and other critical areas; price growth, resulting from increasing demand for basic services and goods from tourists, negatively affect local residents whose income do not increase proportionately.

Furthermore, the seasonal character of the tourism industry creates economic problems such as job/income insecurity, difficulties in getting training, employment-related medical benefits and unsatisfactory housing and working conditions for destinations that are heavily dependent on it. Therefore, the increasing dependence of local communities on tourism (UNEP, 2002) carries significant risks to economies. Economic recession, political instability and insecurity and the impacts of natural extreme events as well as changing tourism patterns can have a devastating effect on the local tourism sector and economies.

2.2. Tourism and socio-cultural change

Tourism has the potential to promote social development through creation of employment (although in great part seasonal), income redistribution and poverty alleviation. Therefore, it can contribute for decreasing or bring to a halt migratory processes which would otherwise be irreversible. Other potential positive impacts of tourism include: tourism as a force for peace, for strengthening communities, benefit to local residents from facilities developed, revitalising of culture and traditions (McKean, 1976), and the encouragement of civic involvement and pride.

However, tourism can cause change or loss of local identity and values, brought about by several closely related influences: commodification, homogenisation, loss of authenticity and staged authenticity, adaptation to tourist demands, culture clashes, economic inequality, irritation due to tourist behaviour, job level friction, income inequality, cultural deterioration, conflicts with traditional land-uses, depriving local people of access, ethical issues, crime generation, child labour, prostitution and sex tourism and social stress due to resource use conflict (Hall 1997, Wood 1991, Shaw & Williams 1997, UNEP 2002).

From the spatial point of view, tourism represents an acceleration factor for population movements from rural inland areas, which are more marginal in economic terms to urban coastal areas, which are strongly affected by the growth of this activity.

The positive consequences of tourism can occur only when tourism is practised and developed in a sustainable and appropriate way (UNEP, 2002). Involving the local population is essential. A community involved in planning and implementation of tourism has a more positive attitude, is more supportive and has a better chance to make a profit from tourism than a population passively ruled (or overrun) by tourism. One of the core elements of sustainable tourism development is community development, which is the process

and capacity of making decisions that consider the long-term economy, ecology and equity of all communities.

2.3. *Tourism and environmental change*

Environmental impact of tourism development is a serious concern. In some popular destinations, the natural sources of attraction of the area have been damaged or destroyed due to overbuilding and irresponsible development. Tourist behaviour can have adverse consequences, both deliberate and unintentional, as far as the environment sustainability of the tourist destination is concerned.

As tourists have to visit the place of production in order to consume the output, it is inevitable that tourism activity will be associated with environmental impacts. Tourism, like other sectors, uses resources, generates wastes and creates environmental, cultural and social costs and benefits in the process. Given the increasing current societal sensitivity to environmental concerns, environmental degradation can affect holiday choice, and reduce future earning resulting from tourism. Tourism and recreation can impact natural environment to such an extent that it can lead to a change in markets. This is of particular concern in some European countries and regions, which might feel tempted to develop unsustainable tourism as a 'quick fix' to assist economic recovery or maintenance. Tourism-environment interactions need to be better understood before recommendations can be made for a balanced relationship with the environment (Cater and Goodall, 1992).

Much of the damage done to the environment as a result of tourism is caused by the pressure of the volume of visitors arriving at destinations which are not used to supporting people in such great numbers. Growth in visitor numbers also puts severe strain on the local capacity of specific geographical areas such as coastal areas, mountains and wetlands.

Uncontrolled conventional tourism poses potential threats to many natural areas around the world. It can put enormous pressure on an area and lead to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss, increased pressure on endangered species and more vulnerability to forest fires. It often strains water resources, and it can force local populations to compete for the use of critical resources.

Arising from such research is the idea that each destination has a tourism carrying capacity. This suggests a tolerance limit which, if exceeded, leads to an unacceptable degree of damage to the character and quality of the destination environment or the tourist's experience and satisfaction.

Ecotourism, nature tourism, green tourism, low-impact tourism, alternative tourism, responsible tourism, and quality tourism are usual expressions to sustain or even enhance the quality and attractiveness of the natural environment. There are several definitions of ecotourism, however Goeldner (2000) defines ecotourism as the responsible travel to natural areas that conserves the environment and sustains the well-being of local people. This segment of the tourism industry, which has contributed in 2000, with US\$154 billion in receipts and is growing 20% annually, reflects those consumers who are aware of the issues facing travel and tourism. However, the increasing rates of growth of this segment of the market are also being considered as a threat for those areas less unspoiled by human activity, which for that reason are the destination of ecotourists.

Ecotourism, with its principles of responsible tourism, may satisfy environmentalists, but they only would guarantee sustainability if the needs of the local population are also considered. In fact local populations rarely benefit from tourism, even from these new, and more environmental conscientious, forms of tourism. The creation of natural reserves to protect extensive tracts of land has frequently the wicked effect of

denying the traditional access to local populations for agriculture, gathering of fuel wood, fodder and building materials (Cater & Goodall, 1992).

The benefits of ecotourism can result from the jobs and income provided to local people, making possible to have funds for purchasing and improving protected or natural areas to attract more ecotourists in the future; provide environmental education for visitors; encourages heritage and environmental preservation and enhancement. However, making ecotourism a reality and avoiding a new way of bring visitors to fragile environments ruining them rather than preserving them, is still problematic.

According with the Guidelines for a National Policy of Ecotourism (1994), the Brazilian government, considers ecotourism as a segment of tourism activity that stimulates the sustainable use of the environmental and cultural heritage, encourages their conservation and looks for the building of environmental awareness through the interpretation of the environment and enhances the well-being of the population involved.

Therefore, ecotourism is perceived as a nature-based form of alternative tourism that embodies the virtuous traits that mass tourism lacks. It emphasises learning as a result of the ecotourist and the natural environment interaction. But due to the difficulties of ensuring a type of activity that completely lacks of an ecological foot-print (whatever is its size), some authors consider that ecotourism is present when its promoters make every reasonable effort to ensure that their operations are sustainable, and in line with current best-practice principles and guidelines (Weaver, 2001), i.e. minimising the negative impacts on natural and cultural heritage, increase the awareness of the tourists to the need of environmental conservation, ensure that the infrastructures are developed in harmony with the environment, and maximising the benefits and economic activities of local communities.

Ecotourism is characterised by small-scale outfits in more or less remote locations, tourists typically stay with local families, or at small, environmentally-friendly hotels called ecolodges, which facilitates cross-cultural exchange (Lindsay, 2003).

3. **Tourism and strategies for sustainable local development**

The development of rural areas is directly connected with the way land is used, which depends not only from the biophysical dimensions but also from the socio-economic dimensions (Bouman et al, 2000), especially in what relates with decision-making (Lourenço, et al, 1997 & 1998). So in regions where agriculture plays a significant role as provider of income to the individuals, it is important to invest in increasing agricultural productivity and restructure the current farming systems (UNDP, 2003). These efforts should aim at generating higher yields (within sustainable thresholds), decreasing the dependency to one type of production (diversifying the cash-crops for international and local markets and the livestock production) and diversifying the network of off-farm economic activities, to avoid the migration of rural population to urban areas. However, only in an integrated way it is possible to design policies aiming at reducing poverty of rural areas turning them attractive for public and private investment, which needs a critical mass of labour force, that is only possible to set if there is already some regional potential conferred by the natural resources and man made infrastructures.

Each decision-maker has his own objectives, which will frame the ways how he evaluates the information on the alternatives. The assessment of different strategies should be made against a set of objectives which have following general aims:

- Increase economic benefits for local communities through the growth of employment and wages, diversification alternative income sources, and increase of local enterprises expectations;
- Promote the conservation and sustainable use of natural resources;
- Enhance non-livelihood impacts through the increase of labour force expertise, growth of local access to infrastructures and public services, and mitigation of environmental impacts;
- Enhance participation and partnership through the increase of flows of information/communication as a means to improve supportive policy/planning frameworks, increase of local communities' participation in the decision-making processes, and building of public/private partnerships.

3.1. Tourism in Bahia, Brazil. Sustainable management of Atlantic forest rural areas

The Brazilian case study was carried out in the Cachoeira Catchment. This area is located in southern Bahia, with a drainage surface of around 4 600 km², which encompasses twelve municipalities. Around 600 000 inhabitants live in the area of the catchment. There are two main activities in these municipalities: cocoa production and cattle husbandry. Nevertheless, the coastal municipalities, especially Ilhéus, have a potential tourist activity, which is being developed in the last years.

The region was responsible for the world's 2nd largest cocoa production. Cocoa plantations are situated in municipalities nearer to the coast-line and as cocoa is grown under shade trees (an agroforest model traditionally known as Cabruca), this area is in great part associated to reminiscent of the Atlantic tropical rainforest: the Mata Atlântica. In this catchment there is a striking diversity of agricultural areas that are marked by diverse natural features and intensity of human intervention.

In the upper catchment area livestock production is dominant, and may be responsible for problems of soil erosion and striking environmental degradation. Hills and a lesser mountains range surrounds the lower area, in the centre of which is the catchment. These lowlands have a special importance in the development of cocoa plantations of the region. Much nearer the coast and to the south of the central hills, for reasons of soil type, are less productive to cocoa plantings and are characterised by concentration of small farmers.

Over the last 12 years cocoa plantations were subject to high disease pressure (witches' broom). As a result some farmers in search of alternative agricultural activities, uprooted cocoa and felled the shade trees associated to cocoa on farms. About 50% of the 600,000 ha under cocoa were partially or totally abandoned and with it the state of the forests suffered losses causing various levels of deforestation.

There are four main types of economic activity in the catchment:

- The cocoa production, with decreasing significance due to the disease "vassoura-de-bruxa" and the low prices of cocoa in the international markets;
- The cattle raising, which shows a significant trend of increase in the cocoa areas;
- The tourism, more significant in the coastal areas of Ilhéus, is nowadays in a phase of growth with incentives to the ecotourism by using old cocoa farms and exploiting natural features such as waterfalls, lagoons, and forest reserves;
- The industrial activity was related with agro-industrial activities during several years: milk in Itabuna and cocoa processing in Ilhéus. In the last years some incentives attracted some industries related with new technologies in Itabuna.

Due to the geographic location and the availability of adequate infrastructure, the cities of Ilhéus and Itabuna became the main

centres of convergence and services of the region. On the other hand, they are the municipalities of greater population concentration in urban areas.

Two alternatives related with nature-based tourism were considered to increase farmers' income; to settling the rural population in the fields (avoiding huge migrations to the major cities); to decrease the economic dependence from monocultures, to promote the conservation and sustainable management of the systems Mata Atlântica and Cabruca.

Leisure tourism concerns the nature-based activities more related with relaxation. In fact this strategy is mainly related with the classic "3S" vacations: sea, sand and sun, but also includes some activities that can be named as sport tourism such as diving, fishing, surfing, and windsurfing. It also includes the secondary houses for domestic tourists that are also located near the sea-shore. However, this alternative was proposed not in terms of mass-tourism but in sustainable terms: contribute to improve the standards of living of the host population in the short and long term; and satisfy the demands of tourists without putting in risk the capacity to attract them in the future, by a soundly management of the natural resources that are in the root of the activity.

It requires the development of hotels and resorts near the coast line (beach-related tourism developments); and infrastructures related with accessibility, water, supply, sanitation, energy, and communications. Moreover, it requires infrastructure services such as: commerce, travel agencies, rent-a-car agencies, bank agencies, which should support activities such as shopping and sightseeing of cultural and "natural" landscapes. These supporting infrastructures not only facilitate tourism but also contribute to improving the quality of life for residents.

Ilhéus' beaches would be the main focus for this alternative. However, it should avoid the idea of a mass-tourism, which is often associated with large-scale developments, externally controlled, with high leakage (money spent by tourists ends up leaving the region), and concentrated in high-density tourist strips, leading to strong environmental degradation. On the opposite it should adopt a general approach to ensure that its activities are non-polluting and non-visually intrusive in the limits of the carrying capacity of the host environment.

Ecotourism is a form of nature-based tourism that make every effort to be ecologically, socio-culturally and economically sustainable while providing opportunities for: appreciating and learning about the "natural" environment, experimenting some activities that are more adventure oriented and offer some degree of risk (trekking, climbing, rafting, canyoning, tree climbing, canopy walking, horseback riding, kayaking, etc.), and activities related with agrotourism, in which the interaction of tourists, nature and on-farm activities is more effective.

These activities should promote: creation of local jobs, settling the population in rural areas, diversification of the local economy through the creation of small and medium enterprises, improvement of social equipments and of transport, communication and sanitation infrastructures, and creation of an alternative income to the protected areas that can reinvest it on pursuing other conservation strategies.

Cachoeira catchment has some features with an important degree of attractiveness to this type of activities:

- The forest ecosystem of Mata Atlântica, with a structure and floristic composition highly diversified, and high degree of endemism of fauna and flora. However, the fragility and fragmentation of this ecosystem doesn't allow the existence of large groups of visitors, and the entire supporting infrastructure must be very light.
- Cabruca farms, where an agro-forestry system (cocoa cultivated under the shade cover of native canopy trees) created a structural diversity very similar to natural forest.

Furthermore, the ecotourist can contact with the different phases of the cocoa production and processing.

- Farms with agrosilvopastoral systems, in this diversified farms the tourist can contact directly with producers and production systems. There he will be lodged, and participates in the day-life of the farm. Furthermore, he can buy products from the farm (eggs, legumes, fruits, meat, flowers, etc.) or that were there processed (jams, cheese, handicrafts, etc.). The contact with better quality and better price products, will promote another source of income to the farmer.

These two alternatives related with tourism are both nature-based. However, ecotourism is considered less aggressive to the environmental conditions of Cachoeira catchment. Some interactions can be seen between these two alternatives:

The people that go to the coastal resorts and hotels also visit protected areas, especially if they are near the resort. Therefore, ecotourism offers another type of activity (a chance to learn about natural attractions) when these tourists take a break from their moments of sea-side relaxation, tanning, shopping, and city sightseeing.

Protected areas (natural reserves, parks or private reserves) are ideal ecotourism venues and sustain the activity. Protected areas have regulations in place to ensure the maintenance of the unspoiled natural environments, and frequently have outstanding landscape settings which increase their attractiveness.

The remaining forest fragments in the Atlantic Forest need to be protected immediately in order to prevent species extinctions. One strategy to achieving this goal would be the delimitation of Integral Protection Units or Sustainable Use Units, of governmental responsibility, aiming at promoting a balanced relationship between people and nature to reconcile the conservation of biodiversity with its sustainable use. Another measure would be the spreading out of Private Natural Heritage Reserves (RPPN) which are established on private land and are an important tool for biodiversity conservation, complementing the government efforts to protect nature. However, the creation of natural reserves to protect extensive tracts of land has frequently the wicked effect of denying the traditional access to local populations for agriculture, gathering of fuel wood, fodder and building materials. Nevertheless, isolation of forest patches is advancing rapidly, and isolated protected areas and their buffer zones will not prevent the collapse of ecological functions and associated biodiversity. Therefore, conservation corridors that link up the patches of protected areas through a matrix of biodiversity-friendly land use and reforestation/regeneration would be one of the most effective forest conservation strategies in the long term. Furthermore, in humid tropical regions the recovery of the degraded landscape through natural regeneration processes will take place within a time frame acceptable to the foreseen human use.

Ecotourism, profiting from the natural protected areas (natural reserves, parks or private reserves) and from the cocoa farms, which are ideal ecotourism venues and sustain the activities. Protected areas should have regulations in place to ensure the maintenance of the unspoiled natural environments and outstanding landscape settings, which increase their attractiveness. The activities to be developed should profit from the Mata Atlântica's highly diversified structure and floristic composition, and high degree of endemism of fauna and flora, and from the Cabruca farms, where the ecotourist would contact with a structural diversity resembling natural forest, and with the different phases of the cocoa production and processing. Environmental preservation, especially in what concerns the delimitation of protected areas, should be related with ecotourism, given the fact that they could play the role of attractive areas for ecotourists. However, investing only in the delimitation of protected areas could not be enough for ensuring

the preservation of the forest, being necessary to promote the reforestation (through the construction of ecological corridors) between these isolated patches.

Investment in ecotourism has the quality and attractiveness of the natural environment in the core of its development, but one of its main aims is to provide well-being to local populations. However, this strategy should be carefully considered because even if it is mainly targeted for small groups of people, its success can transform it in new forms of "mass" tourism with all the negative impacts inherent to the presence of big crowds in "natural" places. However, adventure oriented activities and agrotourism activities would promote the creation of new local jobs, the settling of population in rural areas, the diversification of local economy through the creation of small and medium enterprises, the improvement of social equipments and of transport, communication and sanitation infrastructures, and the creation of an alternative income to the protected areas that can reinvest it on pursuing other conservation strategies.

The main activities, to be developed by small groups would be: appreciating and learning about the "natural" environment, experimenting some activities that are more adventure oriented and offer some degree of risk (trekking, climbing, rafting, canyoning, tree climbing, canopy walking, horseback riding, kayaking, etc.), and activities related with agrotourism, in which the interaction of tourists, nature and on-farm activities is more effective.

3.2. Tourism in Goa, India. Resources consumption and integrated coastal zone management

The Indian case study was carried out in the Baga-Nerul Catchments, which are located in the district of North Goa, in the west coast of India. With 1 176 km², this area encompasses 12 villages with around 60 000 inhabitants. The three coastal villages of Calangute, Candolim and Anjuna concentrate the preferences of tourists.

As a tourist destination, Goa was put on the tourist map in the 1970s by the "flower children" that search the region in the quest for its pristine beaches and friendly people (Noronha et al., 2003). Tourism contributes with around 20% of the net state domestic product. Only in the 1990s the growth of international tourism took off.

This area has seen significant economic changes in the last 40 years: increasing terciarization of the economy, with significant shifts from traditional activities (agriculture and fishing) to the services sector, especially in those activities related with tourism industry that become the more important activity in the region.

Tourism in Goa is a coastal phenomenon with a seasonal activity, concentrated from October to March when the climatic conditions make suitable the use of sand, sun, and sea. Therefore, tourists are almost absent during the monsoon season.

Seasonality brings the usual problems: underused infrastructures and laid-off workers during off-season; additional stress on coastal resources due the concentration of tourists on limited space and time during season.

Although the significant involvement of local communities (about 30% of the households are associated with some kind of tourism activity) there is a feeling amongst them that the gains from tourism are not substantial. Large hotel chains and external investors are diverting the benefits and local populations have to bear the social and environmental burden.

Tourism produced in the region new resource use and waste generation patterns. The conversion of agricultural and orchard land to built-up areas is quite common, showing the shift from a means of production into a commodity for trade. However this introduced stress on coastal aquifers and degradation of

coastal vegetation with significant impacts in the way ecosystems provide services and goods for the communities.

Coastal aquifers in the region are highly vulnerable to pollution and analyses of groundwater reveal the heavy contamination with bacteria, certainly in relation with the sewage disposal sites, the septic tanks and soak pit disposals that characterise the sewage system of the area. The effects of tourism industry in the vegetation of the region are evident. There was an increasing of green areas (mainly of anthropic woodlands and grass) although accompanied by a loss of biodiversity and original vegetation. Dune vegetation, in particular, was strongly disturbed to give place to built-up areas.

Four main types of hotels (and therefore of tourists and resource use) were analysed in terms of its impact on coastal resources and communities:

Low-budget hotels: Family run and therefore are those with more involvement of local communities. Low requirements of infrastructure, investment and labour force. Tourists with low level demands willing to interact with locals and experiment local lifestyle. The stress on resources (land and water) is low.

Middle-budget hotels: like an extension of the former but with higher investment. Dependent of charter tourism, with strong impacts in resource use, and, in the absence of systems for sewage and solid waste treatment, can have significant impacts in the long run. High percentage of workers laid-off during off-season.

High-budget hotels: private companies that cater for the upper income group of charter tourists, which have higher demands for comfort and facilities. Higher stress on resources use, but the treatment of waste (solid and liquid) minimises environmental damages. Longer tourist season.

Luxury hotels: these hotels with huge landscaped gardens exert the greatest pressure in terms of resource use but have waste disposal systems that, in principle, reduce environmental loads. Large investments, external to the region. During off-season, the staff employed is engaged in the maintenance and upkeep of the installations.

More than any other sector, tourism depends on a healthy natural environment to sustain it. Goa is a region, which has natural and cultural assets - its beaches and exotic life - to attract visitors and generate tourist income. Local communities and state and national governments all stand to benefit from an increase in global tourism. However, there is also a potential loss. Too rapid, unplanned, or uncontrolled development all have the potential to create associated environmental degradation on the long term, eroding the quality of the very assets on which such development is based.

Tourism activity in the area is based on a fragile offer and demand, i.e., the infrastructures offer a deficient quality and the demand is searching for low prices. The absence of sewage systems and the deficient waste management has important impacts on the water quality. Besides, the non-existence of water treatment and distribution infrastructure is preventing the assurance of water quality for public consumption. These are apparently the cause for the spread of diseases and health problems among inhabitants and eventually tourists.

The type of tourism enterprises existent in the area doesn't have financial capacity to build the appropriate equipment for environmental protection. In fact, these units have a low or even inexistent capacity of investment; therefore, they have a limited ability to invest in sewage systems and waste treatment. As a matter of fact, future investments in general are strongly limited by the low income and its fluctuation.

Landscape deterioration is also a characteristic of the area that can jeopardise its attractiveness for tourists. The pressure for building constructions is increasing and the vegetated areas are decreasing. The traditional aesthetic value of some of these

areas is in danger. The cultural and historic features of Goa are not being developed and the identity values are vanishing.

In view of the degradation of the type of tourist offer, the advantages of Goa are not competitive with other regions. The vulnerability to external drivers is higher.

From the point of view of social sustainability, the situation of local families is not guaranteed. Incomes are low, labour is rather unqualified, so investments in small activities are low and capability to react to change is also limited. Besides, administration (local and regional) gives little support and quality of life is bad.

From environmental sustainability perspective, a common point is highlighted in the alternative scenarios: the need to invest in sewage infrastructures, waste treatment and management, public water supply system, roads and transport networks. These are elementary needs in terms of environmental protection. Even in the present, the situation is not environmentally sustainable. Improved caution in the use and management of the resources is a priority in any scenario.

4. Final remarks

Sustainable development is being seen as the basis for a genuine balance between economic growth and environmental values. In fact, there is a considerable corpus of literature based on empirical evidence showing that the degradation or depletion of the environment affects in different ways people inside societies and among countries in different ways, creating and increasing reinforcing new ways of social and economic discriminations. However, to achieve the goals of sustainable development it is comprehensible that "...economic growth must remain a legitimate objective of national governments and the world community..." (Pearce & Warford, 1993). Nevertheless, it is clear now that the former models to pursuit economic growth, which don't give the adequate consideration to the environment, are unlikely to be sustainable (Loureço, 2001). In fact it is important, at the same time man develops technology, which can enlarge the limits of the carrying capacity of ecosystems, to reduce, by means of effective policies, the patterns of consumption and to adapt practices of conservation of natural resources (Bartelmus, 1999).

Decades of human pressure on natural resources resulted in a new approach to development, which also points to the future but, contrarily to prior approaches, "...to a bleak future of scarcities rather than a bright future of progress..." (Sachs, 2000). Development is only possible when economic fairness, social equity and environmental sustainability are guaranteed. To find solutions to these problems is one of the main challenges of our society (Machado, 2002).

To accomplish the necessary growth of well-being without compromising the capacity of natural resources also producing that well-being for future generations is a challenge that implies to cut with the existent relationship between economic growth and natural resources use, which has driven to the present situation of environmental degradation. It means also to shift to a paradigm of natural resources management, instead of natural resources exploitation, to bring to a halt the current unsustainable patterns of production and consumption (UNDP, 2003).

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References:

- Bouman, B. A. M.; Jansen, H. G. P.; Schipper, R. A.; Hengsdijk, H. and Nieuwenhuysse, A. N. (eds.), 2000. *Tools for land use analysis on different scales. With case studies for Costa Rica*. Dordrecht: Kluwer Academic Publishers
- Cater, E. and Goodall, B. 1992. "Must Tourism Destroy its Resource Base?" in A.M. Mannion and S.R. Bowly (eds.). *Environmental Issues in the 1990s*. Chichester: Wiley, pp. 309-324.
- Cooper, C.; Fletcher, J.; Gilbert, D.; Wanhill, S. 1998. *Tourism: principles and practice*. New York: Addison Wesley Longman Publishing
- de Kadt, E. (ed), 1979. *Tourism: Passport to Development?* New York: Oxford University Press,
- Goeldner, C. R. 2000. Tourism 2000: Asia Pacific's Role in the New Millennium, *Journal of Travel Research* 38, pp. 280-281.
- Hall, C. M. 1997. "Sex Tourism in South-East Asia", in L. France, (ed.) *Sustainable Tourism*, London: Earthscan Publications Ltd, pp.113-119
- Lourenço N. and Jorge, R. 2003. "Tourism: spatial dimension and driving force". in L. Noronha et alii. (eds.). *Coastal tourism, Environment and Sustainable Local Development*. New Delhi: TERI, pp. 31-60.
- Machado, C. R.; Lourenço, N.; Jorge, R.; Rodrigues, L. 2002. Sustainability: Importance of social networks in the decision-making processes. in *Proceedings of Conference Policies and Tools for Sustainable Water Management in the European Union*. Venice, Italy. November 21-23
- Machado, C. R.; Reisdorff, C. and Duriavig, M. 2004. *The challenge of sustainable ecosystem development in Cachoeira catchment (South Bahia, Brazil)*. Barcarena: Universidade Atlântica
- Mill, R. C. and Morrison A. M. 2002. *The Tourism System*. Dubuque: Kendall/Hunt Publishing company
- Nairy, K. S.; Kazi, S.; Abraham, M.; Jorge, R. 2003. "The Baga-Nerul watersheds: tourism, local stakes, and transformations". in L. Noronha et alii. (eds.). *Coastal tourism, Environment and Sustainable Local Development*. New Delhi: TERI, pp. 61-93
- Shaw, G. and Williams, A. M. 1997. "Individual Consumption of Tourism" in L. France, (ed.) *Sustainable Tourism*, London: Earthscan Publications Ltd, pp.106-112
- UNEP 2002. *Impacts of Tourism*. Nairobi: United Nations Environment Programme
- Wood, E. R. 1991. *Tourism, Culture and the Sociology of Development*. Paper prepared for ASEASUK conference on Tourist and Development in South-East Asia, University of Hull.
- WTO 1999. *International tourism: A global Perspective*. Madrid: World Tourism Organisation
- WTO 2000. *Tourism 2020 Vision*. Madrid: World Tourism Organisation
- WTO 2005. *Tourism highlights*. Madrid: World Tourism Organisation
- WTTC 2006. *Travel & Tourism – Climbing To New Heights*. London: World Travel & Tourism Council

Breve história da malária em Portugal: o ontem, o hoje e o amanhã.

Parte I: O ontem: retrospectiva histórica.

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A malária ou paludismo é uma doença infecciosa aguda ou crónica causada por protozoários parasitas do género *Plasmodium*, transmitidos pela picada do mosquito *Anopheles*.

A malária mata 3 milhões de pessoas por ano, uma taxa só comparável à da SIDA, e afecta mais de 500 milhões de pessoas todos os anos. É a principal parasitose tropical e uma das mais frequentes causas de morte em crianças nesses países: mata um milhão de crianças com menos de 5 anos a cada ano. Segundo a OMS, a malária mata uma criança africana a cada 30 segundos, e muitas crianças que sobrevivem a casos severos sofrem danos cerebrais graves e têm dificuldades de aprendizagem.

A designação paludismo surgiu no século XIX, formada a partir da forma latinizada de *paul, palude*, com o sufixo -ismo. Malária é termo de origem italiana que se internacionalizou e que surge em obras em português na mesma altura. Termo médico tradicional era sezonismo, de sezão, este atestado desde o século XIII.

Até meados do século XX, a malária não era apenas uma "doença tropical". Registavam-se casos de malária endémica um pouco por todo o mundo. Na Europa, os países do Sul, particularmente da região mediterrânica, eram os mais afectados. Também em Portugal a malária fazia parte das doenças que sazonalmente molestavam as populações rurais, em algumas regiões do país.

Em todo o mundo, até ao século XIX, malária esteve associada aos miasmas exalados pelas águas estagnadas, pântanos e pela matéria vegetal que nestes apodrecia. Em Portugal, a partir do século XVIII, com a prática regular e crescente da cultura do arroz em canteiros inundados, de água paradas, rapidamente estes começam a ser relacionados com as febres (malária), nomeadamente no trabalho de Ribeiro Sanches (1757), *Tratado da Conservação da Saúde dos Povos*.

Até à segunda metade do século XIX, a malária não era um objecto de interesse médico ou administrativo em Portugal. Mas, a partir de meados do século XIX, transformações na economia agrícola do país, levaram ao incremento da cultura do arroz em algumas regiões, nomeadamente nos campos do Mondego. Em consequência as febres voltam à ordem do dia,

como argumento higiénico e político contra a expansão dos arrozais. Na tentativa de resolver tensões, são ordenados inquéritos para apurar do impacto dos campos de arroz na saúde das populações. O mais conhecido e citado até ao século XX foi o inquérito dirigido por Andrade Corvo (1860), no qual se decide pela progressiva proibição da cultura de arroz, classificada como causadora de autênticas epidemias de febres.

No final do século XIX, a bacteriologia ganhava posição firme como paradigma da etiologia das doenças infecciosas, ajudando a medicina a consolidar a sua autoridade na planificação e administração da saúde pública. O *Plasmodium* de Laveran conquistara também posição como agente único da malária (a partir de 1880). Entretanto, Ronald Ross, na Índia, e Giovanni Battista Grassi, em Itália, haviam desenvolvido investigações que apontavam o mosquito *Anopheles* como transmissor do parasita ao homem (c.1898).

Neste ambiente de grande actividade científica, também os médicos portugueses se interessam pelo estudo da malária como um problema de saúde pública, e não apenas nas colónias africanas. Havia tudo a fazer, segundo as novas regras da malariologia. Estas lacunas foram debatidas nos fóruns médicos de então, nomeadamente na Sociedade das Ciências Médicas de Lisboa, de onde partiram as primeiras iniciativas para um estudo sistemático da malária em Portugal. Desses trabalhos destacaram-se os estudos sobre mosquitos de Moraes Sarmento e Carlos França (1901), do Real Instituto