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Environmental and sustainability impact assessment in small islands: the case of Azores and Madeira

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Abstract: This paper compares Environmental Impact Assessment (EIA) practices and effectiveness in the Portuguese islands of the Azores and Madeira. This was accomplished by qualitative appraisal and evaluation of the contents of EIA statements and the characterisation of the EIA practices. Data was collected from the islands' regional environmental agencies and from the Environmental Portuguese Agency internet database. The findings reveal that most EIA project practitioners and consultants in the islands are associated with the regional government agencies. Proposals were generally approved with 'conditions' and the diversity of project types were lower in the islands than in the mainland. There was limited follow-up on the EIA process so that evaluation of conditions compliance was scanty. Key areas identified for consideration in the development of good impact assessment practice in the islands included, the Islands' unique geographical and ecological characteristics, scale effects, intra-insular regional dimension, impact significance evaluation approaches, and training, education and development skills in EIA processes.

Keywords: environmental; sustainability; impact assessment; small islands.

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1 Introduction

Due to the special vulnerabilities and unique ecological and biodiversity characteristics of Small Islands Developing States (SIDS) and island territories, their sustainable development has been the concern of decision-makers, international agencies and researchers (Bass and Dalal-Clayton, 1995; Douglas, 2003; 2006; Ramjeawon and Beedassy, 2004; McIntyre, 2004). Some of the aspects of particular concern that are discussed by researchers include the relative small size of many small islands states; their

respective geographic isolation; narrow economic base and dependence on larger countries; limited resources; relatively small populations with a narrow skills base; single centres with high population densities and hence high demands on resources; high ratio of coastline to land area; and ecosystems such as coastal lagoons, mangroves, and coral extremely vulnerable to others external ecological influences (Briguglio, 1995; Atkins *et al.*, 2000). Small islands are highly sensitive to environmental problems such as marine and coastal resource degradation, climate change effects such as rising sea level, water resource, waste disposal, land and soil resource usage, desertification and deforestation and industrial pollution (Lohani *et al.*, 1997). They furthermore face impacts from the demands of the tourism industry, including capital development projects, hotelisation of coastal areas, road construction, airport and harbour extensions, dredging, and sand extraction and quarrying.

Environmental Impact Assessment (EIA) is increasingly used to support planning and decision-making for many forms of developments in island states and territories. Various researchers have pointed to deficiencies in EIA applications and weak implementation (Ahmad and Wood, 2002; Momtaz, 2002; King and Walmsley, 2003; IADB, 2004; Ramjeawon and Beedassy, 2004; Walling *et al.*, 2004). Several limitations of the EIA processes, in island regions and mainland states are related to the lack of coordination among the organisations that are involved in the environmental decision-making process (Momtaz, 2002). Further problems that arise include both the absence of public participation (Ahmad and Wood, 2002) and inadequate public participation (King and Walmsley, 2003; Purnama, 2003; Ramjeawon and Beedassy, 2004). Further pronounced drawbacks in many small island states are inadequate screening mechanism, lack of baseline data, deficiencies in data management systems, lack of expertise and trained staff, absence of clearly defined criteria for the eligibility and registration of EIA consultants and accreditation of EIA practitioners (Ramjeawon and Beedassy, 2004; Briffett *et al.*, 2003; King and Walmsley, 2003; Turnbull, 2003).

Island countries have focused attention on environmental and biodiversity impacts and have called for environmental assessment on large projects that are likely to affect the local ecology. This limited focus has all too often left out the social and human health impacts of development projects. To allow for the human perspective, some researchers have called for strategic impact assessment, social impact assessment and health impact assessment to be carried out alongside EIAs. Each type of assessment can separately and systematically consider the consequences of the development projects and the activities of public and private organisations on defined small island communities (Barrow, 2000; Walker *et al.*, 2000; Douglas, 2003; 2004). Thus, there is a need for EIA assessments approaches to be adapted in small island country application to allow wider sustainable development objectives to be considered in strategic policy and the existing and future health status of the population. In small island contexts, other categories of impact assessment, namely, Social Impact Assessment (SIA) and Health Impact Assessment (HIA) are not usual well integrated and conducted in the impact assessment processes, as pointed out by du Pisani and Sandham (2006). Social impacts are the consequences to a population of any project that alter how people live, work, play, relate to one another and organise to meet their needs. Few SIA have been carried out in small islands (Walker *et al.*, 2000; Gilder, 1995). The main aim of this research was therefore to evaluate the state of environmental and sustainability impact assessment practices in two Portuguese small islands, Azores and Madeira. As discussed in the methods sections below, this was

accomplished by qualitative appraisal and evaluation of the contents of EIA statements, recommendations related to impact assessment of projects, plans, programmes and policies and the characterisation of the EIA practices in both islands. Data was collected from the islands' regional environmental agencies and from the Environmental Portuguese Agency internet database.

2 Development of environmental impact assessment and strategic environmental assessment regulations and practice in Portugal

Portuguese EIA practice began in the early 1980s, on an informal and *ad hoc* basis. Transposition of the EEC Directive and systematic EIA procedures came about in 1990, with Decree-Law No. 186/90. The European Community Directive on EIAs, Directive 85/337/EEC, later amended by Directive 97/11/EC, requires environmental assessment of public and private projects that are expected to have significant impacts on the environment. Projects to which the Directive applies and which require EIAs are divided into two main lists types. Annex 1 projects, which requires environmental assessment (Table 1) and Annex 2 projects not requiring mandatory environmental assessment being decided by Member States and considered by thresholds of size and site environmental sensitivity for screening purposes. Decree-Law No. 69/2000, amended by Decree-Law No. 197/2005, transposed the Directive into Portuguese law. A Regulating Decree (Portaria No. 330/2001) defines the main guidelines to accomplish each different EIA component, namely scoping report, the Environmental Impact Statement (EIS) – technical report and non-technical summary – and the follow-up (monitoring plan and reports). EIA follow-up is concerned with the post-decision stage after EIS, including activities such as monitoring and auditing, *e.g.*, post-evaluation or post-decision analysis, and so it is essential to keep track of the real effects that projects have on the environment. In addition, the follow-up is an incentive for improving the environmental management quality of projects and ensuring enforcement processes (Glasson *et al.*, 1999).

Table 1 Annex 1 projects requiring environmental assessment

Crude oil refineries
Large thermal power stations with heat output >300 megawatts
Nuclear power stations and reactors
Installations for permanent storage or for the final disposable radioactive waste
Iron and steel smelting production
Installations for producing, processing and extracting asbestos and asbestos based products
Integrated chemical installations
Motorway and expressway construction, long distance railways and airports with runways >2100 m
Trading ports and inland waterways permitting traffic of >1350 tonnes
Waste disposal installations for incineration, chemical treatment, landfill of hazardous toxic waste

The EIA process involves several separate but linked stages, including screening, scoping, baseline data collection and analysis, impact prediction and evaluation of significance through to production of Environmental Statements (ES) or reports and post project follow-up analysis where appropriate. Scoping is the process of identifying key environmental issues and the parties affected by a project. One major activity of the scoping stage is the identification of key interest groups and the determination of key lines of communication. A company of consultants usually coordinates the EIS. They are typically contracted by a public or private entity that proposed the project (proponent). The EIA scoping stage in the two island regions were not mandatory and depended on the proponent's decision to run this step. Academia is involved in some of the major national projects in Portugal, coordinating the EIS or acting as an independent quality reviewer. According to legislation, the public has the right to be consulted and to express its views about the project. In the mandatory public consulting process, assessors give interested parties the opportunity to take part and influence decision-making. The government's department responsible for the environment sector appoints the assessment committee and supervises EIA procedures. This committee submits its technical opinion to the Minister of the Environment based on the EIS and the results of public consultation. The Minister of the Environment has the final decision. If he considers that the proposed project and the EIS are adequate, the project is approved and an administrative decision is taken in what is called a 'Declaration of Environmental Impact'. In this document, the Ministry establishes precautionary, corrective and monitoring actions.

The Regional Environmental Directorates or Direcções Regionais de Ambiente (DRAmb) are the agencies in charge of EIA processes in the two archipelagos territories of Madeira and the Azores. They are responsible for all Annex 2 projects. These regional agencies are organisations of the regional government, integrated in the Regional Secretariat for the Environment. Both are responsible for executing policies relating to environmental quality, nature conservation and biodiversity. The Regional Secretariat has responsibility for the projects of Annex 1. EIA procedures and regulations are the same as in the mainland.

The newer and more difficult or specialised types of impact assessment are seldom covered: public engagement; review, evaluation and decision support; social, health and economic impact assessment; risk assessment; use of environmental indicators and communication. HIA is a domain that is generally absent in EIS in Portugal. European and national regulations do not emphasise this theme. Traditionally, environmental and health related issues are not treated together by the environmental agencies and departments, despite some recent efforts to fill this gap. However, as underlined by Ramos *et al.* (2008) joint environmental and health impact assessment is not really a new issue, despite their infrequent presence in EIA reports. For example, Bisset and Tomlinson (1985) mentioned the importance of this topic as a major focus on EIA training courses. Public authorities should consider the nature of the impact, its significance and if it can be justified on public interest groups, before approving a scheme or reaching a regulatory decision concerning an existing activity (Hart, 2004), and should recognise that assessment processes should include ecological perspective and health concerns for island peoples (Douglas, 2003).

In 2001, the European Union (EU) created Directive 2001/42/EC on SEA, which was transposed into Portuguese law by Decree-Law No. 232/2007. The Decree-Law 316/2007 that amends the national framework for land use plans (national/sectoral, regional and

local levels) includes the SEA specific details for those plans. The SEA procedures and regulations are the same as in the mainland, despite the differences in the public agencies administrative structure.

3 Azores and Madeira Islands territories

Azores and Madeira islands are the only two autonomous and ultraperipheral self-governing island regions of Portugal. They are NUTS II regions (according to the European Common Classification of Territorial Units for Statistics – NUTS (EC, 2003)). These islands present a significant diversity in some headline indicators, such as total area, population density, GDP and unemployment rate as shown in Table 2. One of the poorest regions in Portugal and in the European Union, the Azores has a highly peripheral location in the middle of the Atlantic Ocean. The Azores archipelago comprises nine islands, with a surface area of about 2300 km²; the problems of its geographic isolation are compounded by the dispersion of its territory and population, nearly 240 000 inhabitants. Owing to their inadequate infrastructures, the Azores are highly dependent on external energy supplies and their renewable energy potential has not yet been entirely exploited. The beauty of its landscapes of volcanic origin and the attraction of water sports make tourism an important industry, which has promoted major expansion of the service sector industries. Azores is a small regional market, where primary sector (agriculture and fisheries) still has an important weight on the creation of value, despite the preponderance of public services, followed by the commerce and transports. Tourism has an increasing importance on the regional economy (GRA, 2007; Antunes *et al.*, 2007). In environmental terms, the islands have a fragile hydrographic system in spite of the remarkable biodiversity of their vegetation (EC, 2004a).

Table 2 General characterisation of the Portuguese Azores and Madeira regions

<i>Territorial unit</i>	<i>Population</i>	<i>Area** (km²)</i>	<i>Density individuals/km²</i>	<i>GDP* (10⁹ €)</i>	<i>Per capita (10³ €/capita)</i>	<i>Unemployment rate (%)</i>
Azores	241 763	2322	104.1	2.2	9.4	6.7
Madeira	245 011	828	295.9	3.2	13.4	4.6
Portugal	10 356 117	92 117.5	112.2	122.8	11.9	6.8

Notes: * 2001; ** 2004.

Source: INE (2007)

Madeira (composed of two islands with approximately 245 000 inhabitants in a surface area for about 800 km²), has a combination of constraints and advantages resulting from its insularity, remote location and geophysical features. On the one hand, there are the increased transport costs and marketing difficulties, hilly relief and the concentration of 75% of the population in the Funchal area, the very small size of its farms and a highly vulnerable insular ecosystem. On the other, it has an exceptional natural heritage and a powerful attraction for tourists, a microclimate where temperate and subtropical plants coexist, a key position on sea routes, a vocation for the development of biodiversity and great potential for renewable energies. Added to this, it has a young population, a reputation for traditional crafts and scientific and technical capacities. To ensure its regional competitiveness, it is necessary to diversify all of its activity sectors and improve

training conditions. Concerning the environment, remediation infrastructures have to be improved and agri-environmental measures need to be promoted to prevent the degradation of landscapes (EC, 2004b). The tertiary sector is now the main economic sector in Madeira as the primary sector has decreased over the last two decades. Although there is an increase in economic activities, this is mainly related to the leisure and tourism industries. These have created hotel and associated infrastructural development projects and support service employment (GRM, 2006). These economic activities have led to expansion and development pressures and the need for such development project to go through the planning and EIA processes fairly quickly. Islands development initiatives are distant from the more central control in the mainland therefore sustainability assessment may be weak.

Azores and Madeira islands have significant internal (among the islands of each archipelago) and inter-regional (among other Portuguese NUTS II continental regions) development and environmental aspects asymmetries. Their ultraperipheral constrains, valuable natural and cultural assets, significant human pressures and importance for the Portuguese economy show how relevant environmental and sustainability assessment should be for these regions. In addition, the international reputation of the tourism industry (Madeira in particular), and their weight in the regional economy, increases the potential responsibility and interest regarding environmental related concerns.

4 Method and environmental impact assessment data sources

The comparison and evaluation of the environmental and sustainability impact assessment in the two islands was based on a characterisation of the EIA practices in these regions according to the number of projects, project types, project decisions (proposal approved, proposal approved with conditions; proposal rejected, proposal non-compliant) and EIA follow-up. The projects decisions and type of projects were classified according to the directive and Portuguese laws, although some adaptations were done to better highlight the islands differences. Available data on EIA processes and project decisions for evaluation for Azores covered the period from January 2005 to September 2007; for Madeira, the period of January 2002 to September 2007 and for the Portuguese mainland, over the period from January 2001 to September 2007. There were no data available by which to evaluate public consultation in EIA processes and the EIA follow-up in the islands. Source of data for the islands were the DRAmb EIA departments and for the mainland the internet database of the Environmental Portuguese Agency (APA, 2007), which is the national EIA authority. The APA did not have any information about the two island regions as the EIA national database excluded the two territories, despite no clear institutional, legal or technical justification. During the raw data collection and analysis processes, it was possible to identify gaps and limitations in the national database. Incomplete EIA processes characterisation, missing and incoherent data series are significant drawbacks. These data restrictions were taken into account in the findings obtained in the research work. A qualitative evaluation of EIS content on the islands was also carried out based on the analysis of six regional coastal infrastructure projects. SEA practices are just at the commencement of their development in Portuguese mainland and the islands so only a brief qualitative overview about the future trends was possible.

5 Findings and evaluations

Between the years 2000 and 2006, there was no significant variation in the number of projects that conducted an EIA in mainland Portugal although in 2002 there was a slight increase in the numbers (Figure 1). Madeira saw the highest number of projects under EIA in 2003; all the projects were from the public regional or local sector and half were associated small-scale waste management projects (classified as Annex 2 'other projects'). In case of Azores, comparative data was only available from 2005 to September 2007. The diversity of project types was much lower in the islands, compared with the mainland, which is attributable to the small economies of the island territories (Figure 2). The tourism and energy industries provided about 40% in Madeira Island and the extractive industry in Azores about 50% of which required environmental assessments. In both islands, coastal infrastructures, built primarily to support growth in the tourism sector, was a significant contributor to the total number of projects for the period analysed. Deschenes and Chertow (2004), who have argued that islands with large, externally oriented economies often rely on tourism, support this observation. The most representative type of projects in the mainland was Annex 1 categories, particularly, infrastructure projects such as roads, and highways, much of which was European funded public works.

The most common EIA decision in the mainland and the islands were 'approved with conditions' (Figure 3). All the projects in the available dataset for Madeira had this type of decision outcome. Non-compliance to EIS decisions was lower in the islands. This can be related to the higher percentage of projects in which the developer was the regional government and not the private sector. In Madeira at least 40% of the project proponents were from public sector organisations, compared to about 25% in the mainland (according to 2006 APA data).

Figure 1 Numbers of project decisions in Portugal mainland (a) and islands (b) under environmental impact assessment processes

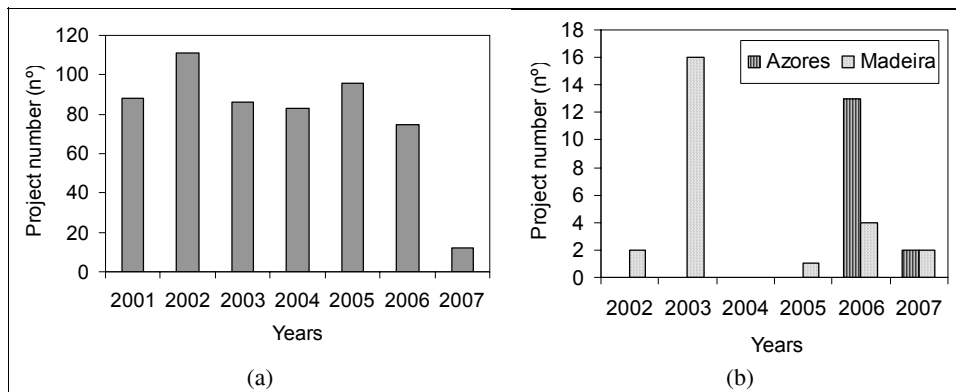


Figure 2 Projects type in the Portugal mainland and islands under environmental impact assessment processes

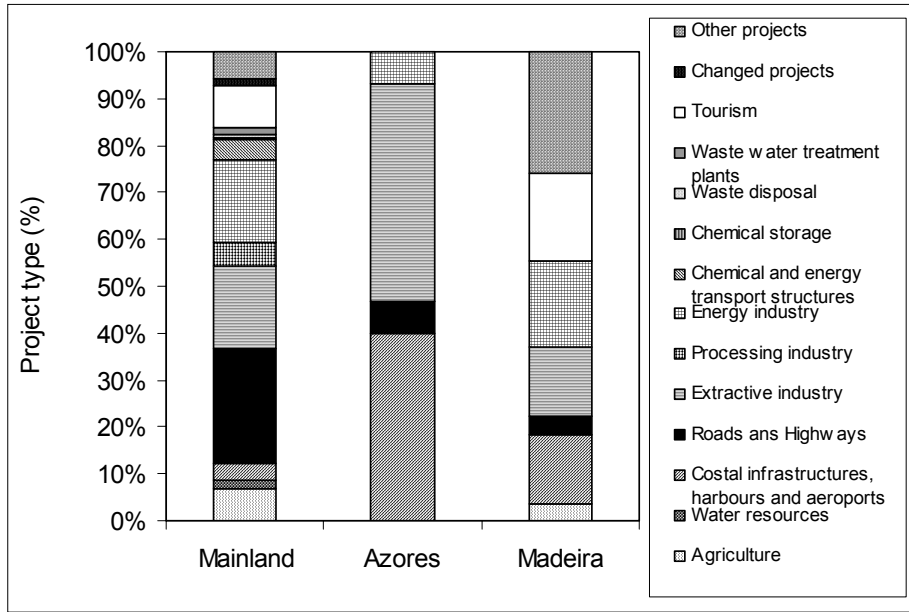
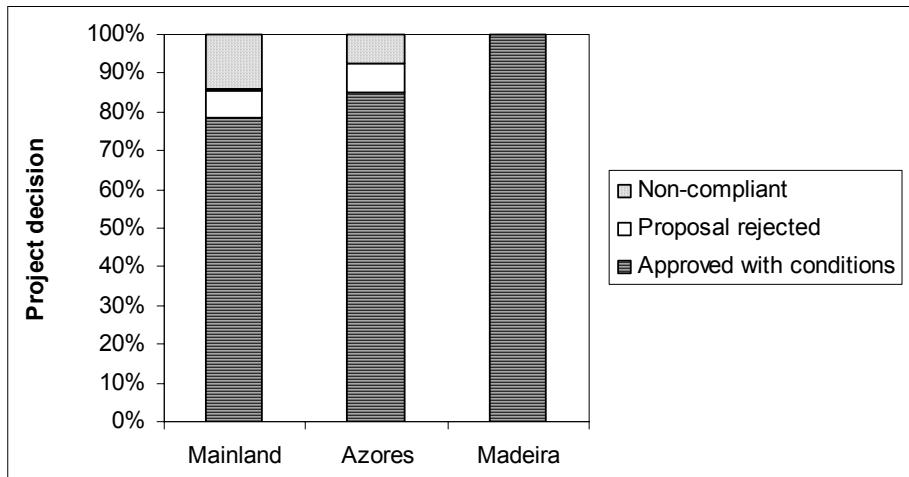


Figure 3 Project decision in the Portugal mainland and islands under environmental impact assessment processes



5.1 Socioeconomic issues

Small islands’ socioeconomic and institutional relationships significantly influence decision-making. Douglas (2006) in discussing challenges for small islands in a changing world, pointed to the complex and differentiated relationships that existed within and between communities and with islands governments in small islands. In the Portuguese

EIA context, ethical and conduct problems commonly arose as the processes are complex and involve many different social and economic perspectives with the addition of public and private pressures (Ramos *et al.*, 2008). Such problems are of particular significance in SIDS and island territories where projects linked to the tourism industry are often given the go-ahead although they may have potential ecological impact problems. For example, SIDS and island territories experience environmental, ecological biodiversity loss and coastal degradation to provide tourism infrastructures. Yet, in terms of social and economic opportunity costs, without tourism, islanders are exposed to lower economic activity levels and poverty, which is one of the issues that sustainable development policies and the United Nations millennium goals set out to tackle. In the Azores and Madeira islands, land use conflicts and biodiversity disruptions were noted as frequent significant impacts, yet, in many such cases, the projects were approved with relatively unspecified conditions.

5.2 Data and technology issues

Two aspects of the data issues that affected the EIA process in the islands. One related to the data required to carry out the baseline study stage of the assessment. The other related to the availability of data for post EIA study. In both cases, there were insufficient data available to influence both the pre-decision-making stage and post EIA or follow-up evaluation in the islands. Environmental assessment techniques use technologies such as GIS, simulation and modelling, and internet tools for public participation processes. Such technologies were not easily available in the islands as in the mainland.

5.3 Scoping and baseline studies

Baseline studies, an important aspect of the scoping stage, refers to the collection of background information on the ecological, socio-economic and socio-cultural settings that are likely to be affected by the proposed projects. The baseline study helps direct the EIA process on the important issues to be considered by the EIA studies. The scoping stage helps to determine the scale dimensions of the assessment in terms of detail and spatial extent, which affect the results, and accuracy of the impact assessment (João, 2000). Yet, in EIA assessments in the islands, the scoping stage was not mandatory and was dependent upon the projects proponents. The scoping stage should be mandatory within the islands and the baseline data checked for consistency, coherence and reliability.

5.4 Follow-up data

In the Portuguese mainland, only 157 projects (about 30% of the total number of projects), were recorded as conducting the environmental minimisation measures according to 'Environmental Impact Declaration'. Mandatory post-decision monitoring is a recent phenomenon in Portuguese EIA regulations and relatively few projects have developed and implemented effective post-monitoring programmes. Thus, no data was available on post-decision EIA in the two islands territories. There was no quantitative data available to evaluate the EIA follow-up activities in the islands. However, qualitative signals indicate that Madeira and Azores almost follow the general national pattern,

reflecting a young stage of EIS development. Several factors could explain this situation, such as the arguments stated by the Morrison-Saunders (1996) and Arts *et al.* (2001), which stressed that despite there being well-defined follow-up processes, the implementation of EIA follow-up was difficult to measure. This was due to inadequate techniques, deficiencies in the EIS and resource limitations.

Assessments carried out in small islands do not necessarily include follow-up. For example, in Tunisia Islands, monitoring is not a legal requirement in the EIA process, although assessment teams carried it out to ensure compliance with the standards (Ahmad and Wood, 2002). The main shortfall with the follow-up stage in small island applications is the lack of resources for assessors to execute monitoring properly (Turnbull, 2003; Briffett *et al.*, 2003). Although follow-up is not distinctively part of the EIA decision-making process, it is important to gather data on approved projects to evaluate whether the projects conform to the EIA recommendations and importantly to inform future EIA processes. However, the question of who is to fund the follow-ups can be an obstacle in SIDS and small island territories with limited financial resources.

5.5 *Environmental impact statements*

The qualitative analysis of EIS reports of regional projects in the islands coastal infrastructures showed that the methodological approaches used, impact significance weighting and integrated evaluation frameworks, were not specifically designed or adapted for the islands context. They were the same as used in the mainland. In addition, the impact assessment teams were non-local, belonging to external companies. Staff experience and training were for 'non-islands' socio-economic, institutional and environmental realities and projects. In this very small regional market, the technical teams that conducted the assessments were often the same, giving fewer opportunities for diversification, innovation and improvement.

Canelas *et al.* (2005) conducted a quality study about EIS in Portugal based on a European Union-supported EIS review document (Guidance on EIA-EIS Review 2001 report) that grades the quality of the EIS studies. The authors concluded that even after 20 years publication of Directive 337/85, in about 22% of the studies analysed, there was still a significant percentage of EIA containing weak provision of information, with gaps and weaknesses, which hindered the decision process. They also pointed out that there were no EIS in Portugal graded as 'full provision' of information, with no gaps or weaknesses.

5.6 *Stakeholders, public participation and sustainability assessment*

The Rio Declaration on sustainable development calls for public consultation in project decision-making as a means of empowering the locals to meet sustainability goals. However, this involves complex dimensions that may not be easily understood or resolved, especially when ethical and conduct issues arise, and when the scope of stakeholders is broadened. Often the terms stakeholders and public participation are used interchangeably in impact assessment discourses. Whereas, both terms imply those groups or persons affected by a project or policy, these terms have subtle, if not obvious differences in meanings. The term 'public' often implies local community who are likely

to be affected by the project while 'stakeholders' imply those who have a legitimate interest in a project which extends the boundary and dimension of the assessment. Public participation in the EIA process implies connotation of the establishment of a forum in which local community groups who are likely to be affected by a project are given an opportunity to air their views and concerns to the developers. It also accords the developers an opportunity to 'sell' or to advertise their proposed project to the local community. This is generally aimed at getting public approval for the project to avoid conflict once the proposed development is underway. The general assumption is that the public often come to such meetings with one voice. However, on the contrary, public opinion is diverse and rarely in agreement concerning the potential impacts and effects of proposed development projects.

Notions of stakeholders often refer to groups, communities or individuals who may claim to have a 'legitimate' right over a project or issue. Such stakeholders may demonstrate a right to be involved in the EIA consultations and decision-making processes. The cut-off point at which such claims become invalid is unclear, since stakeholders are not limited to the local level in which the proposed project will be located but may be from wider dimensions, ranging from local, regional, national to international arenas, and economic, social and political concerns. Thus, the sustainable development debate has broadened the issue of stakeholders by engaging all the relevant people who may have a stake in a project. This includes the global community and future generations, thereby opening another conundrum in the 'impact assessment' lexicon. Biodiversity issues and human induced pollution that threatens the ozone layer increase the scope of stakeholders concerns about the utility of an environmental resource. Principle 2 of Agenda 21 calls on States to ensure that activities, within their jurisdiction do not cause harm to other States or areas beyond their own jurisdiction. Global environmental issues are an integral aspect of the sustainability lexicon and must be addressed by the impact assessment teams in order for the assessment exercise to meet the sustainability goals.

The potential impacts of development projects on coastal ecosystems and biodiversity and to the coral reef provide examples of cases in which the complexity of the meaning of stakeholders in the context of small islands is evident. There are, for example, stakeholders who support a proposed tourism industry project involving hotel complex, supporting facilities and road infrastructures whose evidence suggests minimal ecological disruptions. Other stakeholders, against the proposal, may be from further afield as coastal and marine resources and biodiversity have developed international values and appreciation. EIAs in small islands therefore have a wide variety of stakeholders to consider in order for the processes to qualify as addressing the issue of sustainability. Those concerned about proposed development projects include both local and international stakeholders and future generations and their needs must be taken into account in the decision-making process.

Although data was not available to evaluate public participation and consultation in the Islands under the EIA processes, qualitative signals suggested that levels of participation were restricted. Decision-making was generally supported but the process was less transparent than in the mainland because it did not allow for appeal or for public participation, which is in agreement with findings of other authors (Ahmad and Wood, 2002; Purnama, 2003; King and Walmsley, 2003).

5.7 Strategic environmental assessment

SEA practice is in its infancy in Portugal, including the Islands. The first formal cases of SEA application were completed during 2007. The Operational Programs (FEDER) and the Rural Development Program (FEADER) for each island were some of the first strategic instruments submitted to a SEA. Presently, other instruments, such as the Regional Land Use Plan of Azores are under development and will include SEA in the future. As stressed by Fischer and Gazzola (2006) for SEA, the main international practices have developed based on the experiences of a selected number of countries only and to date, there are no clear answers to whether they are fully valid in all systems and countries worldwide. The same kind of problem exists between small island states, territories, and the landed and continental territories. The main impact assessment approaches and frameworks used in small islands are mainly based on continental territories practices.

6 Recommendations for islands environmental and sustainability assessments

The percentage of EIA highly graded in Portugal in terms of quality has increased in recent years when compared with earlier EIAs (Canelas *et al.*, 2005). Nevertheless, in the case of assessment in the Islands, the approaches used were not specific to the small island context and were mainly the same as the ones used in the mainland. Small islands impact assessment processes should reflect new challenges presented by scientific development, global changes and threats, market pressures, sustainability ethics, globalisation, new technologies, cultural and general non-material values.

A set of key-factors and recommendations are listed in Table 3 to support the development of island impact assessment good practices. Key factors include the improvement of EIA teams' assessment training and skills, tools and resources, including technological support systems and baseline data information systems for carrying out the EIA effectively and adequate governance from the regional authorities.

Since the legal framework does not relate to dimension and issues that are unique in small islands, it should be amended to reflect local realities. We suggest that decision-makers and EIA assessors must develop specific guidelines for assessments in small island context. Such guidelines should cover several important components, including the identification and characterisation of the key factors to implement in the impact assessment. Assessors must recognise the issues that are unique to the islands. They must respect and acknowledge local knowledge of the environment, traditional ways of working and local cultural and social values. Assessment guidelines should consider universal issues, including wider public participation and biodiversity conservation concerns. Policy-makers should not only set out to establish mandatory requirements but should also seek to provide advice and guidance on impact assessment to all parties involved in development activities in small islands, especially public authorities, consultants, developers and the local people. The development of island environmental sustainability assessment should then integrate several important key-factors aimed at influencing the methodological approaches.

Table 3 Key-factors and recommendations for islands environmental and sustainability assessments

<i>Key EIA factors</i>	<i>Summary of rationale</i>	<i>Recommendations</i>
Scale effects (detail and spatial extent)	Scale effects can have significant importance on environmental assessments. Changes in scale, in terms of detail and spatial extent, affect the results of EIA João (2000; 2002). Scale choice can therefore have important repercussions for the accuracy of an EIA study.	The adoption of the scale guidelines proposed should be a fundamental step for the assessments in these territories. The crucial stage to determine scale is the scoping study, and that scoping should be mandatory and involve key stakeholders. The use of spatial technologies (like GIS) and the definition of homogenous spatial units.
Intra-insular regional dimension	Small islands have different economic, sociocultural, institutional and ecological asymmetries when compare to mainland regions. Assessments should underline particularly the intra insular dimension, namely evaluating economic, social, cultural, institutional and ecological asymmetries.	Themes and sub themes chosen for EIA analysis should reflect the islands reality dimensions.
Impact significance evaluation approaches	How to determining the significance of impacts has, to date, only been addressed in a partial and preliminary way (Lawrence, 2007). There is poor baseline data, low skills, training and resources making small islands impact significance evaluation generally deficient. The significance of environmental impacts is dependent, among other things, on the spatial distribution of the effects and of the affected environment, as underlined by Antunes <i>et al.</i> (2001), which could be very important in insular regions.	Determine impact significance by evaluation methods that weight variables according to islands particular criteria and thresholds.
Technical and educational skills	Technical and scientific staff in many small islands states and territories is scarce. There is a lack of trained personnel in EIA and SEA assessments. Only with trained and educated human resources will it be possible to engage and commit small island authorities to improve assessment practices.	Design specific environmental and sustainability education and training initiatives for small islands. International, national and regional agencies should give priority to training. The design of environmental training and education courses should pay particular attention to the programme objectives, the target population, small island requirements and realities, the principal types of islands projects and specific islands tools for reports reviewing.

Table 3 Key-factors and recommendations for islands environmental and sustainability assessments (continued)

<i>Key EIA factors</i>	<i>Summary of rationale</i>	<i>Recommendations</i>
Socio economic factors	Small islands have a narrow economic base and high dependency on tourism. In order to support tourism, most EIAs approve tourism development projects. External dependence leads to development constraints and limitations.	Assessments processes should internalise the islands limitations but encourage the adoption of more sustainable development options. Integrated-assessment involving Cost Benefit Analysis (CBA), SIA and HIA should be employed to reflect the differentiated behaviours and attitudes of island peoples.
Physical, geographical and ecological characteristics and natural resources scarceness	The description of the environment likely to be affected by the project or by the plan or is often narrow in meaning and application, isolated, sequential in the analysis and unsustainable.	The environment likely to be affected by the project or by the plan should be defined appropriately to identify sensitive and fragile environments and ecosystems, natural resources, scarceness, land use conflicts, biodiversity high values and threats, natural hazards and risks prevalence. Design programmes using an integrated and holistic sustainability approach to reflect aspects that require different approaches for islands.
Governance and institutional framework	Lack of proper guidance on EIA process by central government and the legal frameworks are not island specific. The European Commission defines five principles of good governance: ‘Openness, Participation, Accountability, Effectiveness and Coherence’ which are of particularly significance in small islands realities. Due to several institutional, cultural and human development factors, territories these factors are not realised and require improvements in governance practices.	Develop good governance practices. Factors like the local languages, the cultural patterns and values, should be integrated in the participatory and interactive processes. Improve capacity building, public participation. Legal framework should reflect island uniqueness.
Relationships among small islands	Small islands are isolated. They have unique characteristics from mainland territories. Identification of the relationships with neighbour and more distant small islands territories and states is a fundamental issue to take into account in impact assessments. SIDS and island territories tend to establish connections with other similar regions, sharing their visions on strengths, weaknesses, opportunities and threats.	Encourage cooperation networks with other small islands and data and information exchange on technology, innovation, economic and cultural partnerships.

7 Conclusions

While environmental sustainability may yet be a long-term consideration for large, continental nations, it represents a pressing concern for small islands because of their fragile ecosystems (Deschenes and Chertow, 2004). The need to find solutions for sustainable development is immediate for small island states. Portugal has two important archipelagos located in the Atlantic Ocean, which have significant weightings on national targets due to their geo-strategic location and the importance of the tourism industry. This work traced the Portuguese islands profile on environmental and sustainability impact assessment practices and contributed to an understanding of the key factors related to assessment of projects, plans, programmes and policies in island-specific applications. Even though the national EIA laws framework could be the same, guidelines for conducting impact assessment in small islands territories should be developed.

The raw data analysed in this research paper has gaps and limitations. There was insufficient information available to stakeholders concerning EIA follow-up and public participation. These data limitations should be overcome to avoid the legitimacy of the EIA processes in the islands being questionable. In addition, the integration of SIA, HIA and Cost Benefit Analysis should be effectively included into the EIA process. Only in this way, we can mitigate and reverse the negative perceptions of assessments in small islands and the concerns of locals that the assessments are predetermined in favour of developments due to the pressures of high tourism demands.

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References

- Agência Portuguesa do Ambiente (APA) (2007) 'Base de dados dos processos de AIA', http://www.iambiente.pt/IPAMB_DPP (accessed September 2007).
- Ahmad, B. and Wood, C. (2002) 'A comparative evaluation of the EIA systems in Egypt, Turkey and Tunisia', *Environmental Impact Assessment Review*, Vol. 22, pp.213–234.
- Antunes, P., Lobo, G., Videira, N., Santos, R., Fernandes, T. and Ramos, T.B. (2007) *Avaliação Ambiental Estratégica das Intervenções Estruturais Co-Financiadas pelo Fundo Europeu de Desenvolvimento Regional e/ou pelo Fundo de Coesão. Quadro de Referência Estratégico Nacional 2007–2013*, Universidade Nova de Lisboa, Faculdade de Ciências e Tecnologia, Departamento de Ciências e Engenharia do Ambiente, Caparica.
- Antunes, P., Santos, R. and Jordão, L. (2001) 'The application of geographical information systems to determine environmental impact significance', *Environmental Impact Assessment Review*, Vol. 21, No. 6, pp.511–535.
- Arts, J., Caldwell, P. and Morrison-Saunders, A. (2001) 'Environmental impact assessment follow-up: good practice and future directions – findings from a workshop at the IAIA 2000 conference', *Impact Assessment and Project Appraisal*, Vol. 19, pp.175–185.

- Atkins, J.P., Mazzi, S. and Easter, C.D. (2000) *A Commonwealth Vulnerability Index for Developing Countries: The Position of Small States*, London: Commonwealth Secretariat.
- Barrow, C.J. (2000) *Social Impact Assessment: An Introduction*, London: Arnold Publishing Ltd.
- Bass, S.M.J. and Dalal-Clayton, D.B. (1995) 'Small island states and sustainable development: strategic issues and experience', *Environmental Planning Issues*, International Institute for Environment and Development, London, Vol. 8.
- Bisset, R. and Tomlinson, P. (1985) 'EIA training courses organized by the Centre for Environmental Management and Planning, University of Aberdeen: an analysis of experience', *Environmental Impact Assessment Review*, Vol. 5, No. 3, pp.279–281.
- Briffett, C., Obbard, J.P. and Mackee, J. (2003) 'Towards SEA for the developing nations of Asia', *Environmental Impact Assessment Review*, Vol. 23, pp.171–196.
- Briguglio, L. (1995) 'Small island developing states and their economic vulnerabilities', *World Development*, Vol. 23, pp.1615–1632.
- Canelas, L., Almansa, P., Merchan, M. and Cifuentes, P. (2005) 'Quality of environmental impact statements in Portugal and Spain', *Environmental Impact Assessment Review*, Vol. 25, pp.217–225.
- Deschenes, P.J. and Chertow, M. (2004) 'An island approach to industrial ecology: towards sustainability in the island context', *Journal of Environmental Planning and Management*, Vol. 47, pp.201–217.
- Douglas, C.H. (2003) 'Developing health impact assessment for sustainable futures in small island states and territories', *Journal of Environmental Assessment Policy and Management*, Vol. 5, pp.477–502.
- Douglas, C.H. (2004) 'Prospective health impact assessment for sustainable futures: the case of the City of Salford, Gtr Manchester', *Sustainable Development*, Vol. 12, pp.121–135.
- Douglas, C.H. (2006) 'Small island states and territories: sustainable development issues and strategies – challenges for changing island in a changing world', *Sustainable Development*, Vol. 14, pp.75–80.
- Du Pisani, J.A. and Sandham, L.A. (2006) 'Assessing the performance of SIA in the EIA context: a case study of South Africa', *Environmental Impact Assessment Review*, Vol. 26, No. 8, pp.707–724.
- European Commission (EC) (2003) *Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the Establishment of a Common Classification of Territorial Units for Statistics (NUTS)*, The European Parliament and the Council of the European Union.
- European Commission (EC) (2004a) *Fact Sheet: European Structural Funds in Portugal (2000–2006) – Açores (Azores)*, European Commission, Directorate-General for Regional Policy, Inforegio Service.
- European Commission (EC) (2004b) *Fact Sheet: European Structural Funds in Portugal (2000–2006) – Madeira*, European Commission, Directorate-General for Regional Policy, Inforegio Service.
- Fischer, T.B. and Gazzola, P. (2006) 'SEA effectiveness criteria – equally valid in all countries? The case of Italy', *Environmental Impact Assessment Review*, Vol. 26, No. 4, pp.396–409.
- Gilder, N.M. (1995) 'A social impact assessment approach using the reference group as the standard of impact analysis. The case of Hana: Hawaiians and the proposed golf course', *Social Impact Assessment*, Vol. 15, pp.179–193.
- Glasson, J., Therivel, R. and Chadwick, A. (1999) *Introduction to Environmental Impact Assessment*, 2nd ed., London: UCL Press.
- Governo Regional da Madeira (GRM) (2006) *Programa Operacional de Valorização do Potencial Económico e Coesão Territorial da Região Autónoma da Madeira – Proposta*, Região Autónoma da Madeira.

- Governo Regional dos Açores (GRA) (2007) *Programa Operacional dos Açores para a Convergência*, Direcção Regional de Estudos e Planeamento dos Açores, Região Autónoma dos Açores.
- Hart, D. (2004) 'Health impact assessment: where does the law come in?', *Environmental Impact Assessment Review*, Vol. 24, pp.161–168.
- Instituto Nacional de Estatística (INE) (2007) <http://www.ine.pt/> (accessed May 2007).
- Inter-American Development Bank (IADB) (2004) 'The environmental assessment process in Barbados', <http://www.iadb.org/sds/doc/MIREIA-Barbados.pdf> (accessed March 2005).
- João, E. (2000) 'The importance of scale issues in environmental impact assessment and the need for scale guidelines', Research Papers in Environmental and Spatial Analysis No. 62, Department of Geography and Environment, London School of Economics.
- João, E. (2002) 'How scale affects environmental impact assessment', *Environmental Impact Assessment Review*, Vol. 22, No. 4, pp.287–306.
- King, V. and Walmsley, B. (2003) 'Seychelles country report', *Environmental Impact Assessment in Southern Africa*, Southern African Institute for Environmental Assessment, Windhoek, ISBN: 99916-63-03-7.
- Lawrence, D.P. (2007) 'Impact significance determination – designing an approach', *Environmental Impact Assessment Review*, Vol. 2, No. 8, pp.730–754.
- Lohani, B., Evans, J.W., Ludwig, H., Everitt, R.R., Carpenter, R.A. and Tu, S.L. (1997) *Environmental Impact Assessment for Developing Countries in Asia*, Asian Development Bank, Vol. 1, ISBN: 971-561-110-9.
- Mcintyre, M. (2004) 'Pacific environmental outlook', United Nations Environmental Programme, http://www.unep.org/PDF/SIDS/Pacific_EO_final.pdf (accessed March 2005).
- Momtaz, S. (2002) 'Environmental impact assessment in Bangladesh: a critical review', *Environmental Impact Assessment Review*, Vol. 22, pp.163–179.
- Morrison-Saunders, A. (1996) 'EIA auditing to determine environmental management performance', *Eco-Management and Auditing*, Vol. 3, pp.21–25.
- Purnama, D. (2003) 'Reform of the EIA process in Indonesia: improving the role of public involvement', *Environmental Impact Assessment Review*, Vol. 23, pp.415–439.
- Ramjeawon, T. and Beedassy, R. (2004) 'Evaluation of the EIA system on the Island of Mauritius and development of an environmental monitoring plan framework', *Environmental Impact Assessment Review*, Vol. 24, pp.537–549.
- Ramos, T.B., Cecílio, T. and Melo, J.J. (2008) 'Environmental impact assessment in higher education and training in Portugal', *Journal of Cleaner Production*, Vol. 16, pp.639–645.
- Turnbull, J. (2003) 'Environmental impact assessment in the Fijian state sector', *Environmental Impact Assessment Review*, Vol. 23, pp.73–89.
- Walker, J.L., Mitchell, B. and Wismer, S. (2000) 'Impacts during project anticipation in Molos, Indonesia: implications for social impacts assessment', *Environmental Impact Assessment Review*, Vol. 20, pp.513–535.
- Walling, L.J., Douglas, C., Mason, M. and Chevannes-Creary, M. (2004) 'Caribbean environmental outlook', http://www.unep.org/PDF/SIDS/Caribbean_EO_final.pdf (accessed March 2005).