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## EIA policy and practice in Jamaica : a review

Orville P., Jr Grey  
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EIA POLICY AND PRACTICE IN JAMAICA: A REVIEW

A Thesis

Presented to

The Faculty of the Department of Environmental Study

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Orville P. Grey Jr.

May 2004

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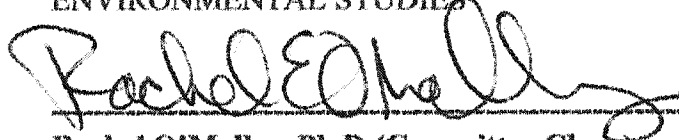
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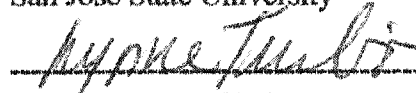
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## ABSTRACT

### EIA POLICY AND PRACTICE IN JAMAICA: A REVIEW

by Orville P. Grey Jr.

Environmental Impact Assessment (EIA) was first established in the US (1970), providing a systemic approach in evaluating the environmental cost of development actions. EIA is not without problems: weak legislative framework, failure in meeting minimum standards, minimal public participation, poor ecological assessments, and inadequate mitigation and monitoring. In 1991, Jamaica enacted binding EIA legislation to ensure environmental protection. This thesis evaluated the Jamaican EIA process with respect to the legislative, administrative and procedural framework, public participation, quality of approved documents, and professional opinion.

The review provided evidence identifying scope for improvements in the following areas: legislative amendments, thoroughness in assessment and compiling reports, and public involvement. Legislative amendments are needed to provide greater control of procedural breaches. Public participation in the Jamaican EIA process is discretionary. However, document quality is improved with actual public participation. Recommended measures to increase the effectiveness in the EIA process in Jamaica are also identified.

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To my grandmothers, this one's for you.

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## LIST OF ACRONYMS

DAFOR	Dominant, Abundant, Frequent, Occasional, Rare
EA	Environment Assessment
EC	Environment Council
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statements
EIR	Environmental Impact Reports
EMP	Environmental Management Plan
FONSI	Finding of No Significant Impact
HAR	Hawaii Administrative Rules
HRS	Hawaii Revised Statutes
IUCN	International Union for Conservation of Nature and Natural Resources
NCC	Negril Chamber of Commerce
NCRPS	Negril Coral Reef Preservation Society
NEPA	National Environmental Planning Agency
NEPT	Negril Environmental Protection Trust
NGIALPA	Negril and Green Island Area Local Planning Authority
NGO	Non-Governmental Organization
NRCA	Natural Resources Conservation Authority
OEQC	Office of Environmental Quality Control

## LIST OF ACRONYMS (Continued)

PIF	Project Information Form
PP	Public Participation
ToR	Terms of Reference
UNEP	United Nations Environment Program
US NEPA	United States National Environmental Protection Act
WHO	World Health Authority

## INTRODUCTION

Principle 11 of the Rio Declaration on Environment and Development proclaims that “States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply.” Jamaica has passed such legislation in the form of laws that require an Environmental Impact Assessment (EIA). This thesis evaluates the effectiveness of the Jamaican EIA process through an assessment of the legislative, administrative and procedural framework; public participation; and document quality done in the tourism sector. EIA has been defined as the need “to identify and predict the impact on the environment and on man’s health and well being of legislative proposals, policies, programmes, projects and operational procedures and to communicate information about impacts” (Munn 1979). Wathern (1992) defined it as “a process for identifying the likely consequences for the biogeophysical environment and for man’s health and welfare from implementation of particular activities and for conveying information.”

In 1970, the United States was the first government to enact environmental impact assessment legislation. The US law, *National Environmental Policy Act* (NEPA), prompted the introduction of similar legislation worldwide; it requires the deliberation of environmental impacts in the planning and decision-making process leading to projects. US NEPA’s goal was to create a national policy to “encourage productive and enjoyable harmony between man and his environment.” NEPA has been emulated by more than 25

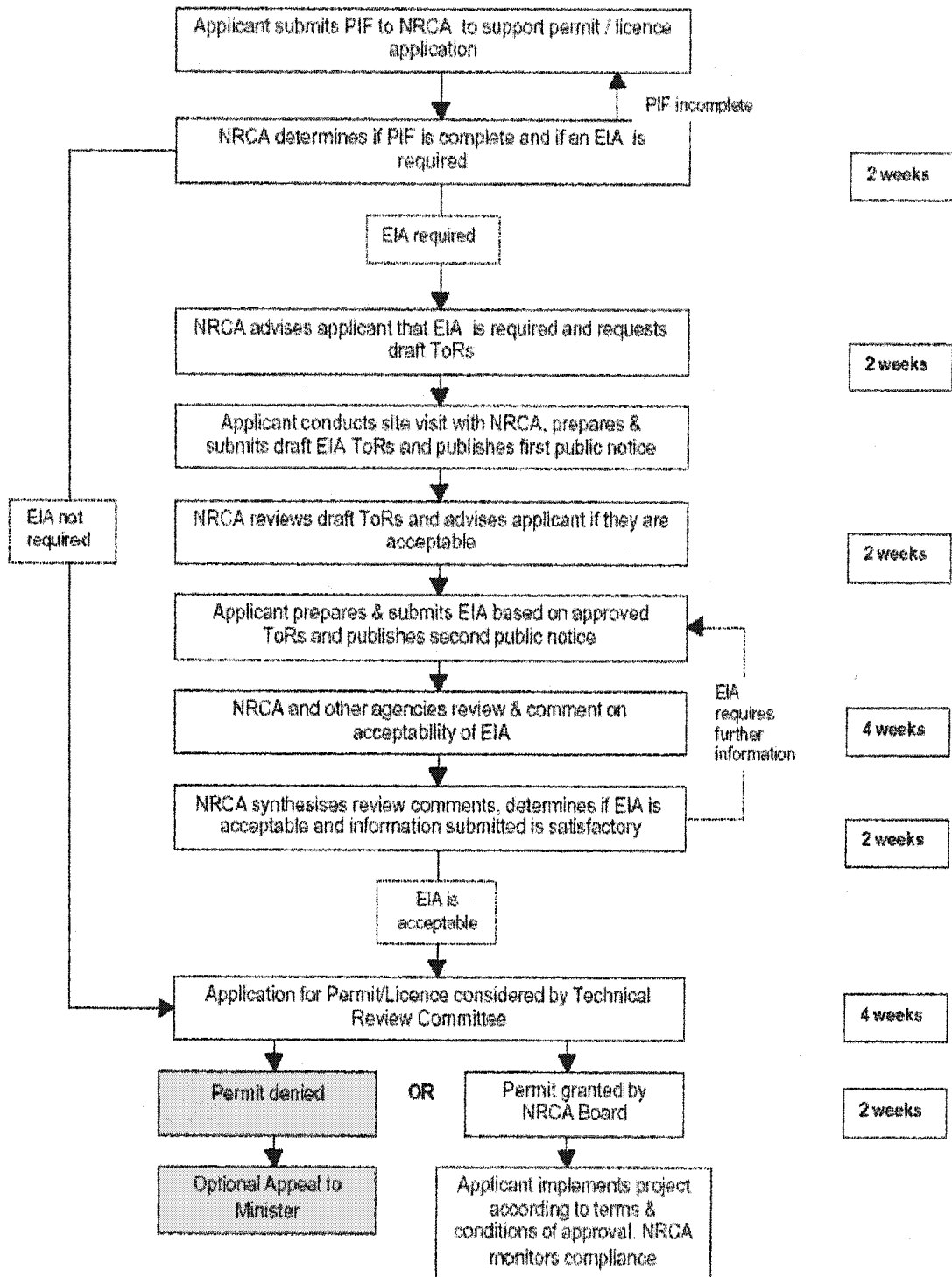
US states and over 80 countries around the world, and serves as a model for environmental impact assessments for such global institutions as the World Bank (Council on Environmental Quality 1997). According to information collected by UNEP, EIA provisions now exist in the framework environmental legislation of 55 developing countries. In addition, at least 22 developing countries currently have specific laws, decrees, or regulations that contain criteria or procedures applicable to EIA.

Bisset (1996) defined EIA as a structured approach for obtaining and evaluating environmental information prior to its use in decision-making in the development process. Impact assessment consists of predictions for how an area is expected to change given certain human activities; these predictions are typically used to reduce potential impacts and manage this changed environment (Bisset 1996). This instrument aids in the decision-making process relating to the location and the implementation of a planned project or measure (e.g., a hotel development, an energy plant) while optimizing the ecological sustainability of the project. EIAs follow clear legal and administrative procedures with regulations governing how participating stakeholders (the public, developers, government agencies, etc.) evaluate and address impacts to the environment, as well as how they involve the public in the planning process. The analysis of environmental impacts is the core task of an EIA. Generally, the analysis includes an assessment of existing environmental conditions, an analysis of the likely effects of a specific project on those conditions, and measures for reducing or eliminating those impacts. If required, different scenarios can be generated such as alternative sites, measures, and techniques.



The Government of Jamaica has embarked on a number of initiatives over the last decade or more geared towards the protection of the natural resources within the context of sustainable development. In 1991, the Natural Resources Conservation Authority Act was enacted in Jamaica and the Natural Resources Conservation Authority (NRCA) was put in place as the *authority* to carry out the mandate to provide for the management, conservation and protection of the Island's natural resources. This system was instrumental in addressing how the country's natural resources should be managed for the betterment of the Jamaican people. Jamaica's environmental law requires an environmental impact assessment for developments that may significantly impact the environment. The regulations/guidelines for conducting EIAs were subsequently provided in 1996 (NRCA 1997).

Section 9 of the Act allows the NRCA to declare parts of or the entire island a "prescribed area," in which specified activities require a permit. Under Section 9 of the same Act, the NRCA has the power to request that an EIA be conducted (Davis-Mattis 2002). On April 1, 2001, a new Authority came into being, the National Environmental Planning Agency (NEPA), representing a merger of three agencies (the NRCA, the Town Planning Department, and the Land Development and Utilisation Commission). The aim of the merger is to integrate environmental, planning, and sustainable development policies and programs through one agency and to offer improved customer service. The Jamaican EIA process is similar in structure to many other systems around the world (Fig. 1 below).



Source: Review and Analysis of the EIA Process in Jamaica (Reeson 2000)

Figure 1: The Jamaican EIA Process

## THE PROBLEM

EIA has been described as one of the most dominant and valuable tools in ecosystem management and protection for the past 30 years (Bisset 1988; Lee 1990). However, evaluations of EIA systems show a number of problems with respect to legal and administrative framework provided, quality of documents approved, scientific quality of ecological assessments, and the usefulness of site-specific evaluations. These problems underlie controversies associated with using the procedure. Jamaica's environmental law requires environmental impact assessments for developments that may potentially have significant impacts on the environment. Although EIA has its drawbacks, the policy has been viewed as largely successful in its ability to integrate decision makers, grassroots communities and industry (Lee 1991, 1992). However, effectiveness in environmental protection is not as clear.

An effective EIA system is needed in Jamaica to address development pressures. For example, over the five year period from 1996 to 2001, there were significant increases in the tourist accommodation capacity in the resort towns of Negril, Montego Bay and Ocho Rios (Statistical Institute of Jamaica 2001). Development for tourists can have major impacts, such as impacts to sensitive habitats such as coral reefs. This growth is expected to continue. A critical evaluation of approved projects is needed to determine the rigor and accuracy of the EIA process and its documents. A thorough evaluation

should include a review of the legislative, administrative and procedural framework as well as approved documents.

A review of the adequacy of the legislative framework will help reveal the extent to which environmental impact assessments are undertaken. Project EIAs may be mandatory only for a limited set of major projects. This raises the issue of which projects should have assessments. The trade-off between the adverse biophysical impacts of a project and the socio-economic benefits represents an important dilemma for decision-makers. The successful implementation of any EIA requires more than procedural compliance. The developments must be critically analyzed, viable mitigations proposed, and monitoring must occur. These measures according to Ahmad and Wood (2002), if in effect, should deliver quality assurance in the practice and administration of the EIA process as described by Fuller (1999).

EIAs are often limited by site specificity and regulatory time constraints in the approval/rejection of projects. The review process for environmental impact statements (EIS), the report produced from the EIA process, has provided evidence that more needs to be done to improve the quality of the process worldwide (Buckley 1987; Treweek 1993). Many EIS documents fail to meet minimum standards. For example, a survey by Jones et al. (1991) of EISs published under UK environmental impact assessment regulations highlighted numerous shortcomings. One-quarter of the EISs were judged not to have data needed to assess likely environmental impacts and, in a great majority of cases, the more complex, interactive impacts were neglected.

Public participation is also a vital part of functioning EIA systems. Legislators at times seek to limit the coverage; however, best practice may lead to a widening of the scope of assessment by employing key public participation guidelines, EIA content guidelines and EIA procedural guidelines (Glasson et al. 2001). Properly designed public involvement has considerable beneficial implications. Aspects of the public participation process that require improvement are: the identification of environmentally friendly alternatives, quality control of the prediction and evaluation of the environmental impacts, and streamlining of political discussion on the social benefits of proposed developments (Glasson et al. 2001). In addressing the issue of public participation, the World Bank (1995) suggested that each level of public involvement should require proponents to be committed to openness in dealing with the public because the people will recognize and respond adversely to token consultation. This point is further reiterated in the literature (Pardo 1997; Palerm 1999).

An important problem is the lack of cumulative impacts analysis in EIA documents. Impacts cited are usually evaluated over significantly shortened time-spans ignoring migration and seasonal changes (Treweek 1993, 1996; Buckley 1987). Cumulative assessments from actions of adjacent developments are typically unaccounted for, thereby misrepresenting either spatial or temporal problems (Warnken and Buckley 1995). Another major problem lies in developers producing statements that are biased towards their development. If unchecked, this bias may end up producing environmental statements that are only “public relations documents” (Lee and Colley 1991).

In an attempt to address these problems, researchers have developed review criteria. Lee and Colley (1990) proposed a hierarchical review framework. At the top of the hierarchy is a comprehensive mark (A = well-performed and complete, through F = very unsatisfactory and N/A = not applicable) for the entire project (Table 1). This mark is based on marks given to four broad subheadings: description of the environment, local environment and baseline conditions; identification and evaluation of the key impacts; alternatives and mitigation of impacts; communication of results. Each of these in turn is based on two further layers of increasingly specific topics or questions. This is the most commonly used review method in the UK. In the US Habitat Conservation Plan (HCP) Checklists provide excellent criteria for EIA review.

Using a modified Lee and Colley Review Package and a modified checklist partially based on the HCP used in the US, this master's research evaluated aspects of the Jamaican EIA process with respect to tourism-related projects in Negril from 1991 to the present. The focus areas for this research include an in-depth analysis of: 1) the legislative, administrative, and procedural framework, 2) the extent to which development projects were subjected to public participation from 1991 to the present, 3) the quality of approved tourism-related EISs, and 4) the opinion of Jamaican EIA professionals regarding the problems in Jamaica's EIA process. Recommendations on how parts of the process can be strengthened, legislatively, administratively, and procedurally, will be derived from the findings.

Data were collected by analyzing documents using qualitative (descriptive) and simple quantitative assessments, especially through the use of checklists. The results

used specific measures to evaluate compliance with the legislative, administrative, and procedural framework to document overall quality, to assess public participation, and to assess the scientific quality of approved documents.

This work is expected to be an important resource for the Jamaican government, especially the National Environmental and Planning Agency (formerly Natural Resources Conservation Authority), as well as academia, especially the University of the West Indies, and consultants in the field. It will provide a baseline review that can be used for other sectors, or as a tool used by consultants to improve the quality of EIAs that they submit for approval. This research has direct value in the wider Caribbean region, as Jamaica has significant expertise in the area of environmental management. This research may also provide a model for EIA analysis in other developing nations in the Caribbean.

Table 1: Review criteria ratings

Rating	Explanation
A	generally well performed, no important tasks left incomplete
B	generally satisfactory and complete, only minor omissions and inadequacies
C	just satisfactory despite omissions and/or inadequacies
D	parts well attempted but must, on the whole be considered just unsatisfactory because of omissions and/or inadequacies
E	unsatisfactory, significant omissions or inadequacies
F	very unsatisfactory, important task(s) poorly done or not attempted
N/A	not applicable, the review topic is not applicable in the context of the project

## RELATED RESEARCH

While EIA has the potential to promote environmental protection, it has come under sharp criticism from ecologists around the world for its lack of scientific rigor (Beanlands and Duinker 1984). The quality of EIAs has long been an issue. There have been a number of attempts to improve the quality resulting in a number of formats being developed for analysis in EIA (Bisset 1988). However, these methods proved the extent to which judgment decisions on the part of the assessors can show up existing problems. Treweek (1996) states that ecological assessment in many EIAs and associated documents are seriously flawed because the ecological effects cannot be predicted or evaluated effectively if EIA is confined to single development actions and constrained by artificial boundaries. As such the issues remain largely unresolved. Treweek (1996) found omissions in the EU Directives and underscored the importance of ecological assessment. Treweek went on to examine the need for a more strategic approach to ecological impact assessment, especially the use of improved data on species distribution and habitats. Treweek also noted the inadequacies of evaluating ecological effects on the basis of a single development or action. There needs to be a more strategic approach to ecological assessment to projects where project-level EIA has failed to effectively quantify the overall impact of new developments on biodiversity (Treweek 1998).

The overall success of EIA is dependent on the qualities of the reports/documents. The EIA process has one principal element, the requirement to prepare and publish an environmental impact statement (EIS or, in the United Kingdom, ES). For the purpose of



this paper these terms will be referred to simply as “statements” throughout to alleviate confusion. Reviews of statements have labeled a significant proportion of them as unsatisfactory worldwide, in both developed and developing countries (Lee and Colley 1991; Warnken and Buckley 1998).

Two relatively recent workshops underlined the deficiencies existing in the EIA process, the European Union workshop on Environmental Impact Assessment Methodology and Research, held in Delphi in October 1994 (Cassios 1995) and the International Study of the Effectiveness of Environmental Assessment which commenced in 1993 and was completed in 1996 (CEAA/LAIA 1995). The EU workshop found three main types of deficiencies at the EIA level:

- General deficiencies due to incomplete understanding of ecological and other relationships, data deficiencies, lack of harmonization of assessment methods across countries, etc.;
- Deficiencies associated with specific types of assessment methods including those associated with well established methods such as checklists, matrices, and network analysis; and
- Deficiencies specific to particular stages in the EIA process such as scoping and screening.

However, some of the deficiencies were not due to incomplete knowledge, but to inadequate understanding and dissemination of data and methods already in existence (Cassios 1995).

General deficiencies due to incomplete understanding of ecological and other relationships, data deficiencies, lack of harmonization of assessment methods across countries, etc.

Bojorquez-Tapia and Garcia (1998) found few statements presenting quantitative analysis of any specific impacts such as air pollution in 33 EISs of highway projects. Approximately half of the statements mentioned conducting any field surveys, half had conclusions not related to impacts evaluated and literature citations in at least six (6) of the 33 cases were incomplete. A review of 37 statements for proposed new roads in the UK revealed the area of land to be taken was quantified in only one case, and none gave detailed breakdown of the areas of wildlife habitat which would be lost (Treweek et al. 1993; Treweek 1996). In the UK, a review of 14 statements for water management projects proved to contain the similar general deficiencies (Hickie 1998). To take account of cumulative ecological effects which cannot be effectively estimated at the project level requires some form of strategic ecological assessment (Treweek et al. 1998).

A review of 50 UK statements prepared for a variety of projects between 1989 and 2000 revealed cumulative impact were far from thoroughly addressed (Cooper and Sheate 2002). Only about 40% (24) of the statements mentioned the term *cumulative effect/impact* and only about 18% (9) provided a discussion. The findings of Cooper and Sheate were adequately supported from previous studies in the US, where there is a legislative guideline unlike in the UK. A review of 89 statements by McCold and Holman (1995) in the US indicated that only 35 statements mentioned the term (Cooper and Sheate 2002).

Deficiencies associated with specific types of assessment methods including those associated with well established methods such as checklists, matrices, and network analysis.

These deficiencies are pervasive. Qualitative or descriptive prose has been blamed as the major failing of this type of deficiency (Buckley 1991; Treweek 1996; Warnken and Buckley 1998). Treweek (1996) revealed only 37% (9) of 37 statements included results of field surveys, of that 35% only 31%, (11% of the entire sample of 37 statements), had been carried out at inappropriate times of the year. Also found were no repeated surveying to show temporal trends. About 62.5% referred to direct habitat loss, with only 3% mentioning habitat fragmentation (Treweek 1996).

Warnken and Buckley (1998) carried out a study to evaluate the design and execution of baseline studies and predictive modeling as a basis for prediction in EIA for the tourism sector in Australia. The accuracy of impacts has long been the sole scientific criteria for best evaluating quality test in an EIA, and as such offers limited application when applied to single developmental impacts on an area. These researchers presented data on assessment and monitoring of tourism development projects in Australia from 1979 to 1993. They discovered that the quality of the scientific data provided in the EIAs was far lower than expected. Only about 65% of the 170 statements reviewed had sampling dates for flora, 14% specified sampling sites, and 6% sampled for more than one season. Regarding terrestrial fauna, the proportions were 78, 16, and 14% respectively, and for marine biota 78, 57, and 13% respectively.

This deficiency can also be seen in water management projects in the UK, further reiterating the fact that the problem is not development (private developers or local governments) or country specific. From a group of 14 flood and coastal defense projects only half used existing matrix techniques or tables to provide the reader with a summary of the effects (Hickie 1998). Review of a further 13 statements in the UK provided conclusive proof that there was a countrywide problem.

Deficiencies specific to particular stages in the EIA process such as scoping and screening

In a review of highway projects in Mexico, about two-thirds of the statements reviewed (33 in all) failed to adhere to prevailing regulation at the time of submission (Bojorquez-Tapia and Garcia 1998). Most EIAs have few testable predictions and even fewer are actually tested during the monitoring stage (Buckley 1991; Warnken and Buckley 1995). Impact predictions and monitoring were found to be mostly qualitative, again a sign to the lack of quantification in statements. In a study carried out in Australia between 1974 and 1982 only 3% of the statements had adequate monitoring data to test predictions (Buckley 1991). The average accuracy of quantified, critical, testable predictions in Australia up to 1991 was 44%±5%. Predictions where actual impacts proved more severe than expected were on average significantly ( $p < 0.05$ ) less accurate (33%±9%) than those where they proved as less or less severe, 55%±6% (Buckley 1991).

One of the major problems seems to be the site-specific nature of statements done for development projects. Spellerberg and Minshull (1992) considered this to be an over-

reliance on consultation to obtain site-specific information. This is seen in statements where birds are sampled more often than invertebrates and the micro-flora and fauna are almost never surveyed (Spellerberg and Minshull 1992; Treweek et al. 1993). Too few studies have been done that monitors the long-term consequences of development actions (Treweek 1995).

### The Role of Public Participation

The importance of EIA as a public information tool is also widely accepted but not always properly integrated (Buckley 1997). Buckley (1997) pointed to the importance the public plays in forming a screening level for projects occurring anywhere. Public participation has grown over the past few years, mainly in tune with a greater public awareness of threats to the quality of life. In most countries, however, institutional and legal participation is restricted to a few areas, such as EIA procedures, where public hearings are part of a formal process. As pointed out by Soneryd and Weldon (2003), there are many incentives to improve public participation in EIAs not least the role it plays in conflict resolution. Although decision-makers have tried to address concerns by increasing public participation, this area still stands out as being a failure (Dresner and Gilbert 1999).

In a review of case studies of public participation in EIA process in Italy was found to be the minimum expected and required by the European Union Directive 87/337/EEC (Del Furia and Wallace-Jones 2000). Similar studies in Hungary, UK, Sweden and Spain also highlighted that, in most cases, public participation was at the

minimum of the Directive with few variations due to the nature of projects and project principals (Soneryd and Weldon 2003; Palerm 1999; Pardo 1997). Del Furia and Wallace-Jones (2000) documented *no power* (information) attributed to the public and *low power* (consultation) by the state provisions in Italy. In cases where the public was involved, their involvement was *post-EIA*. Palerm (1999) in Hungary found there were inadequate opportunities for early participation offered by a governing decree 86/1993; however, in this case the possibility of improvement was made through a 1995 Environment Act requiring public review of statements. In Spain public participation is only garnered in the last phases of an EIS (Pardo 1997).

Another problem was the disregard of public comments to projects undertaken. Pardo (1997) was able to find cases where public involvement led to solutions to problems which had not been formulated in the screening and scoping phases or in the EIS. The same was true for some road projects, the public indicated alternatives to some sections, but the EIS did not include them. There needs to be facilitation during the EIA process to ensure that no single interest is dominant, and that the public is given the opportunity to voice their concerns as pointed out in the review of public participation in the Czech Republic (Richardson, Dusik and Jindrova 1998). In reviewing statements in Jamaica, this research will add to the existing literature by revealing the strengths and weaknesses existing in the Jamaican system and providing recommendations on how best to improve the quality of documents presented for approval.

## OBJECTIVES

This research evaluates Jamaica's EIA process since 1991. It uses the following approaches to evaluate the EIA process:

- A comparative assessment of the legislative, administrative, and procedural background of the EIA system in Jamaica and Hawaii. Hawaii is a developed island state with similar environmental and tourism issues as Jamaica.
- A review of the effect of the 1997 Jamaican EIA guidelines on public participation in the EIA process, using tourism-related projects in Negril, Jamaica since 1991.
- A review of effect of public participation and EIA quality in EISs of tourism-related projects in Negril, Jamaica since 1991.
- An analysis of the critical problems in the Jamaican EIA process through structured interviews of Jamaican EIA professionals.

The following specific research questions and/or hypotheses pertain to each of the above objectives:

*Research area 1: Legislative, administrative, and procedural measures in EIA in Jamaica and Hawaii*

Hypotheses:

- H1. Jamaican EIA laws will be legislatively similar to the Hawaiian state EIA laws,

H2: Jamaican administrative, procedural and foundation measures will be weaker than those in Hawaii.

*Research area 2: Public participation*

Hypothesis:

H1. Jamaica's 1997 public participation guidelines improved actual participation in EIA practice.

*Research area 3: Does public participation affect document quality?*

Hypothesis:

H1. Document quality prior to Jamaica's 1997 EIA guidelines is lower than document quality post 1997 EIA guidelines.

H2. EIA quality is higher in documents with more public participation.

*Research area 4: Professional opinion*

Research question:

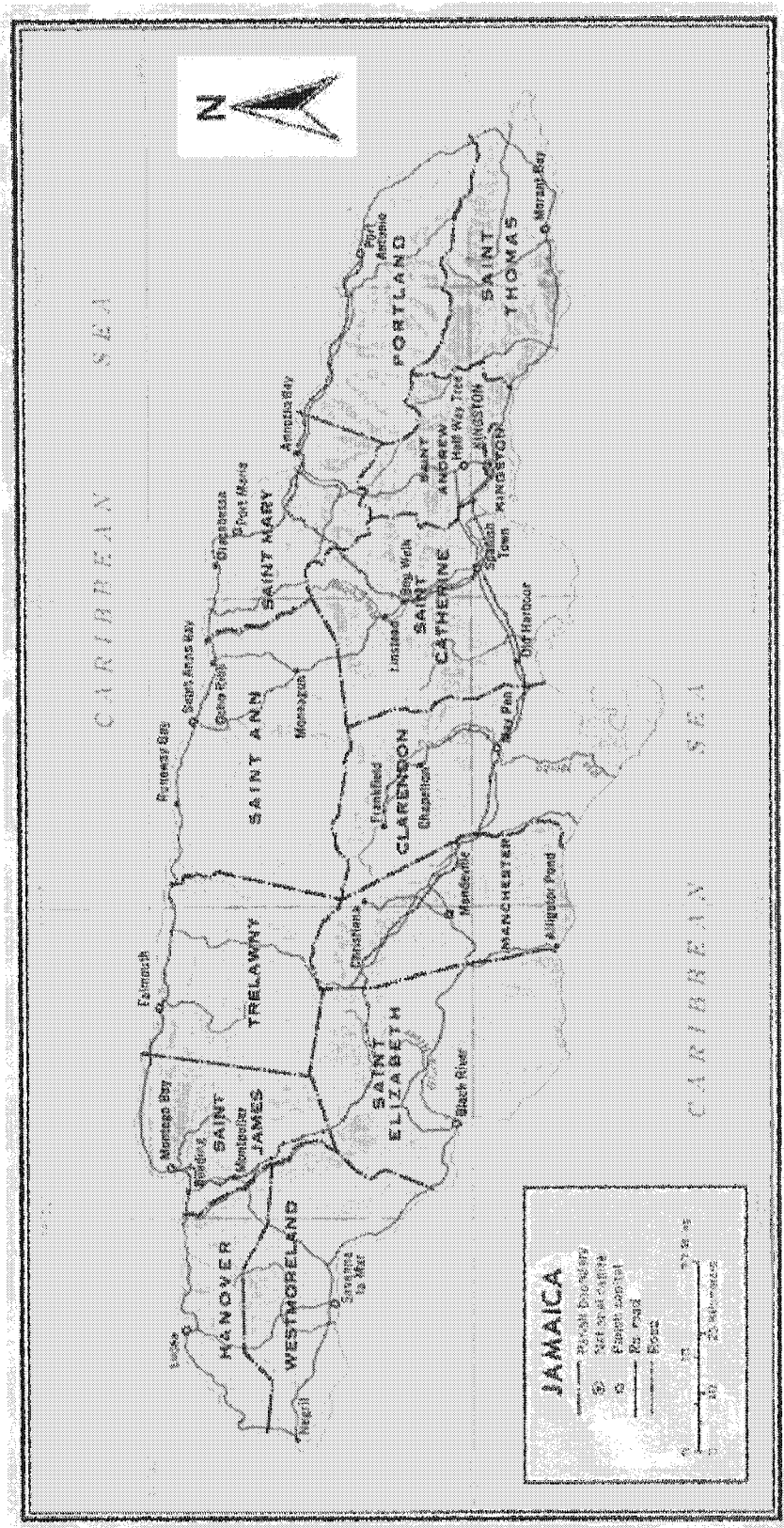
What problems do Jamaican professionals perceive with the Jamaican EIA system as it relates to the following areas?

- i. Legislation
- ii. Implementation
- iii. Effectiveness in identifying impacts
- iv. Effectiveness in reducing impacts



## STUDY AREA

The independent Island of Jamaica is about the size of the US state of Connecticut. Geographically, it can be found at 18 15 N, 77 30 W (Figure 2). Almost at the centre of the Caribbean Sea, Jamaica lies 150 kilometers (90 miles) south of Cuba and 160 kilometers (100 miles) west of Haiti, the two nearest countries. The country is on the direct sea routes between the United States, Europe, and the Panama Canal. Jamaica is the largest of the English speaking West Indian Islands. Roughly ovoid in shape, Jamaica is about 11,424 square kilometers (4,411 square miles). The country measures 243 kilometers (146 miles) from east to west, and its greatest width is 80 kilometers (51 miles). Jamaica has a tropical maritime climate which assures that dramatic fluctuations in temperature are virtually non-existent. Mountain breezes keep the temperature year round at an average of about 27° C.



[Source: [www.travel-images.com/maps-america.html](http://www.travel-images.com/maps-america.html)]

Figure 2: Map of Jamaica

Jamaica has two seasons, rainy and dry. Weather patterns can change quickly, especially between May to December. Officially, hurricane season lasts from June to November. Rainfall is much heavier on the north coast of Jamaica where the average annual rainfall is 198cm (78in.). The prevailing winds in the West Indies are from the northeast. The island is rimmed by a narrow coastal plain pitted with bays everywhere but in the south where broad flatlands cover extensive areas. Most of the resorts huddle along the north coast, where the vegetation is lush and the beaches are white and sandy. The island is 235 km long and 82 km wide at its widest point (Downer and Sutton 1990). It has a total land area of 10,982 km<sup>2</sup> and a population of just over 2.6 million people according to the 2001 census data. Negril is located in the parish of Westmoreland in western Jamaica, and is a popular tourist destination with an estimated population of 9,000.

### Sample Area Background

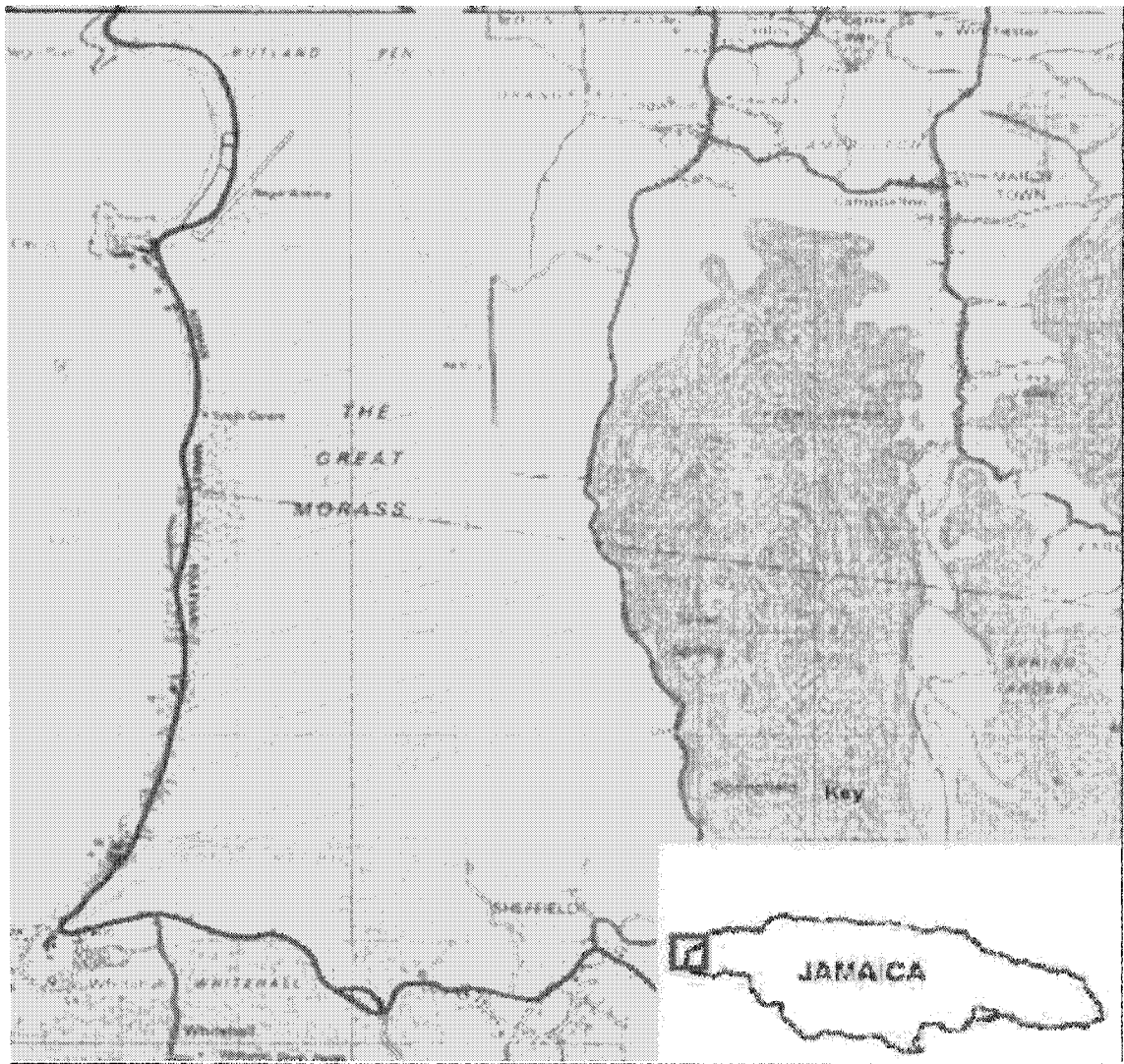
The study site comprises all hotel developments that are located along the Bloody Bay and Long Bay areas of Negril (figure 3). The World Travel and Tourism Council state that travel and tourism industry is the leading global industry. Travel and tourism are responsible for \$4,495 billion in global activity, approximately 11% of GDP worldwide, and employs 8.2% of total world employment (207 million jobs worldwide) in 2001 (WTTC 2001). The Jamaican tourist industry saw 13.78% more stopovers in 2000 than in 1996 welcoming 1,322,690 visitors as against 1,162,449 growing at an average of 3.29% (Ministry of Tourism and Sports 2000). Negril accounted for a

significant portion of stopovers for that period. However, the mean number of visitors dropped significantly due to the terrorist attacks of September 11, 2001. The 1998 accommodation figures show that 51 hotels, 100 guesthouses, and 151 resort villas could provide nearly 5000 rooms. Based on records of attendance and services provided by the local clinic, the Health Department estimated a total population of approximately 9000, including commuters and visitors, for the Negril village and its surroundings (Ministry of Tourism and Sports 2000). The land use of the area around Negril includes undeveloped uplands, rural residential areas, small farms, canefields, large estates, and an increasing urban centre.

As an island, Jamaica has a high level of unique endemic plant species. Approximately 784 of Jamaica's 3000 plants are found in Negril. The terrestrial environment supports endemic flora such as the endemic Royal Palm (*Roystonea princeps*). The endemic orchid *Broughtonia negrilensis* is named after the area. The Negril Morass is Jamaica's second largest wetland (2300 ha) and contains mangroves, shallow estuaries, lagoons, salinas, herbaceous, and swamp forests. It also supports a high diversity of vegetation and associated wildlife, especially reptiles, amphibians, and birds. The bird population of Jamaica is composed of more than 200 species with over 50 vagrants or rare winter visitors, 25 endemic species, 21 endemic subspecies, and 74 winter visitors (Downer and Sutton 1990).

The livelihoods of the local community are at risk from the reduction in environmental quality and fish stocks due to pollution from the tourist development. The coral reef environment supports many species of fin fish, shellfish (shrimp, lobster,

conch), and reptiles (sea turtles). Historically, the coral reefs of Negril were considered to be some of the best-developed reefs in Jamaica and the Caribbean (Goreau et al. 1997). All around the island of Jamaica, coral reefs have undergone a series of shifts in their flora and fauna following two major hurricanes (Hurricane Allen in 1980 and Hurricane Gilbert in 1988), and the die-off of the spiny sea urchin (Hughes 1995). The Negril area, which is a dynamic environment, suffers from the cumulative impacts of natural disasters and human impacts.



[Source: RIU Bloody Bay EIR, CL Environment Co. Ltd. 2003]

Figure 3: Map of Negril, Jamaica

## RESEARCH METHODS

### Overview

This study is based on the qualitative and quantitative analysis of legislative, administrative, and procedural structures, approved EIA documents, and semi-structured interviews of EIA professionals in Jamaica. Quantification of data is limited to the basic level (nominal and ordinal).

### Study Design and Data Collection

#### *Research area 1: Legislative, administrative, and procedural measures in EIA in Jamaica and Hawaii*

Legislative, administrative, and procedural documents of Jamaica's EIA system were evaluated at the NEPA document center, and through library and agency databases in Jamaica. Legislative, administrative, and procedural documents of Hawaii's EIA system were gathered through university and/or agency support in the USA, as well as using internet databases such as Hawaii's government websites. Data on the scope of the legal regulation, administrative requirements, and procedural aspects of environmental policies to projects were contrasted qualitatively between the two systems.

#### *Research areas 2 and 3: Public participation and document quality*

Data sources included all approved tourism-related EIA statistics for the period 1991-2003 along an 11km strip of land bordering the Caribbean Sea in Negril, Jamaica.

The environmental impact statements comprise hotel developments and commercial ventures.

Methods. Eight (8) EISs were reviewed at the NEPA document center during June and July of 2004. They were all tourism related projects conducted in Negril, Jamaica. There were six (6) hotel projects and two (2) commercial projects: Real Negril Hotel, Proposed Vendors Arcade, Couples Negril Hotel, Commercial Complex, Negril, Sea Splash Plantation Resort, Negril Harbor Hotel, RIU Tropical Bay Resort Hotel, and RIU Bloody Bay Resort Hotel

NEPA keeps a record of EIAs done in Jamaica. Private consultants included in the EIA process of selected “projects” were contacted for their materials where there were discrepancies or missing documents. The Lee-Colley Review Package checklist was used to evaluate the quality of EISs. Public participation for each project was documented in terms of quantity and quality of comment letters and public hearing reports documented for each project. An ecological assessment was also conducted using a modified checklist partially based on the habitat conservation plan used in the US (Hoekstra et al. 2002). The standards used to evaluate the ecological qualities of each project EIA are given in Appendix C.

Parameters used to evaluate documents were:

1. Descriptive statistics about the projects including geographical extent and qualifications of consultants.
2. Descriptive statistics about the state of rare, threatened, endangered, and endemic species.



3. Descriptive and/or quantified statistics regarding the environmental impacts.
4. Questions regarding description of methods used in ecological assessments, and
5. Descriptive statistics of the likely significant effects of the project.

#### *Research area 4: Professional opinion*

Structured interviews were conducted with fifteen (15) Jamaican EIA professionals working for governmental agencies (such as NEPA) and non-governmental organizations (such as academia, private consultants and NGOs). The interviews were conducted individually after work hours, using an open-ended questionnaire, in a comfortable setting of their choice. Interview questions evaluated the Jamaican EIA system regarding the following evaluation parameters: decision-making, public participation, and application of science.

#### Analytical Methods

##### *Research area 1: Legislative, administrative, and procedural measures in EIA in Jamaica and Hawaii*

Research area was assessed using a simple qualitative (descriptive) review of the respective framework associated with each country. The documents were read thoroughly and reviewed using the following evaluation guidelines on work by Leu et al. (1996) and Ahmad and Wood (2002), which evaluates performance through systemic and

foundation measure criteria (Table 2). The evaluation model assesses the completeness and effectiveness of EIA systems, by identifying similarities and differences in the performance of the Jamaican and Hawaiian EIA systems and attempts undertaken by each to strengthen their respective systems.

Table 2: Systemic and foundation measure criteria

<p><b>A: Systemic Measure Criteria</b></p>
<p>1. Scope of legal regulation</p> <ul style="list-style-type: none"> <li>• Legal provisions for EIA</li> <li>• level of government</li> <li>• Provisions for appeal by the developer or the public against decisions</li> <li>• Legal or procedural specification of time limits</li> <li>• Formal provisions for strategic environmental assessment [SEA]</li> </ul>
<p>2. Administrative aspects</p> <ul style="list-style-type: none"> <li>• Authorized agencies and their respective powers and functions (Competent authority for EIA and determination of environmental acceptability)</li> <li>• Provisions for EIA Guidelines</li> <li>• Provisions for technical guidance for various types of development</li> <li>• Review body for EIA</li> <li>• Provisions for independent EIA review authorities</li> <li>• Level of coordination mechanisms for EIA implementation with other agencies</li> </ul>
<p>3. Procedural aspects of legislation, standards and regulations</p> <ul style="list-style-type: none"> <li>• Communication procedures and time tabling</li> <li>• Specified screening categories</li> <li>• Systemic screening approach</li> <li>• Systemic scoping approach</li> <li>• Requirement to consider alternatives</li> <li>• Specified EIA report content</li> <li>• Systemic EIA report review approach</li> <li>• Public participation in EIA process</li> <li>• Systemic decision making approach</li> <li>• Requirement for environmental management plans</li> <li>• Requirement for mitigation of impact</li> <li>• Requirement for impact monitoring</li> <li>• Appeals process</li> </ul>
<p><b>B: Foundation Measure Criteria</b></p>
<p>4. Foundation Measures</p> <ul style="list-style-type: none"> <li>• Existence of general and/or specific guidelines</li> <li>• EIA system implementation monitoring</li> <li>• Expertise in conducting EIA</li> <li>• Training and capacity-building</li> </ul>

*Research area 2: Public participation*

Research area 2 addressed the effect of the 1997 guidelines on public participation. Public participation was evaluated on the basis of the type, quality, and quantity of comments generated in the approved documents; the nature and strengths of the relationship between the public and the EIA procedure and the goals and factors in the Jamaican system that contributes to achieving effective public participation. This data was also supported with information garnered through the structured interview instrument.

*Research area 3: The effect of public participation on document quality*

Research area 3 addressed the effect of public participation on document quality. The EISs were reviewed using the Lee-Colley Review checklist to provide information on the quality of EISs through systematic review. The checklists used a hierarchical structure and symbolic letter grade symbols. The hierarchy consists of four broad areas each with specific evaluation areas: description of the environment, local environment and baseline conditions; identification and evaluation of the key impacts; alternatives and mitigation of impacts; communication of results. Each EIS was reviewed starting at the lowest level of each of the four broad areas. A letter grade was recorded for each criterion within each subgroup on a collation sheet. The review continued upward with letter grades being assigned until an overall assessment was given, hence the hierarchical structure (see Appendix B and H). These grades can be used to test an EIS compliance with the relevant regulations, with the pass/fail mark lying between grades C and D. This

data is then compared to data on public participation incorporated in the eight EISs, and other documents acquired from NEPA.

The ecological assessment for each project was evaluated on the basis of the scientific and technical basis of assessments done. The data was analyzed using a qualitative (descriptive) and simple quantitative assessment through document review. The qualitative assessment was based on a "read and review" format using a checklist partially based on the habitat conservation plan used in the US. Each document was reviewed to determine whether each criterion was adequately addressed and what information was absent (Appendix C). Simple quantitative statistics (nominal and ordinal), will be recorded such as ranking of quality of statements, yes or no answers or a set of ordered factors reflecting relative ranking or magnitude.

#### *Research area 4: Professional opinion*

Research question 4 addressed the opinions of professionals familiar with the Jamaican EIA system and practices. Twelve individuals were interviewed that collectively represented the following groups: academia, private consultants, government and non-governmental organizations. The professionals were asked questions relating to decision-making in EIA, application of science and public participation. Each individual was presented with a confidentiality document signed by the interviewer and interviewee prior to the asking of any question. Information was elicited from responses to the questionnaire with the individual being able to skip questions they were not comfortable answering. Responses were recorded in note form only without any identification of the

individual being made. Individuals were assigned a number corresponding to the appropriate professional category. These codes were destroyed after six months.

Recommendations for improving the effectiveness of the legislative and administrative framework, public participation and ecological assessments of the Jamaican EIA system are provided. These recommendations are based on the findings of research questions 1 through 4.

### Limitations

The document review represents only a small sample of existing documents within the tourism sector. The study addresses the documentation only up to the point of project approval. Mitigation and monitoring measures after the fact will not be addressed. However, the value of the work will not be compromised as the results will provide a baseline review of the EIA process as well as useful recommendations that can be applied locally and regionally to improve the tool.

## RESULTS

### Research area 1: Legislative, administrative, and procedural measures in EIA in Jamaica and Hawaii

Overview: This section of the paper evaluates the performance of both Jamaica's EIA system and Hawaii's, against two sets of evaluation criteria. The first set uses systemic measure criteria (legislative, administrative, and procedural provisions), and the second uses foundation measure criteria (Ahmad and Wood 2002 and Leu et al. 1996). The similarities and differences and strengths and weaknesses of both EIA systems are outlined in this section (see table 3). Both Jamaican and Hawaiian authorities have legislative provisions pertaining to EIA: a framework enabling law and a more detailed specific law respectively.

H1. Jamaican EIA laws will be legislatively similar to the Hawaiian state EIA laws,

#### *EIA Legislative provisions*

The EIA legislative provisions addressed the legal provisions for EIA, the level of government and provisions for appeal, and legal and/or procedural specification of time limits by law.

Hawaii's Environmental Impact Statement (EIS) law, which was enacted in 1974, is patterned after the US federal National Environmental Policy Act of 1969. The

Environmental Review Law (Chapter 343, §11-200-5) states that any state agency or county agency that plans to initiate an "action" (a program or project) on certain lands must prepare a document called an environmental assessment (EA). This requirement for an environmental assessment also applies to a private person who is officially requesting approval for a proposed action. There are two main agencies mandated to administer the EIS law in Hawaii, the Office of Environmental Quality Control (OEQC) and the Environmental Council.

The OEQC and the Environmental Council, both attached to the Department of Health for administrative purposes. The Environmental Council created in 1970, is a fifteen-member citizen board appointed by the governor that is responsible for making the rules that govern the Environmental Impact Statement (EIS) process for the state of Hawaii. The Council is approves exemption lists for minor activities that can be implemented without first preparing an Environmental Assessment (EA). The OEQC which was also established in 1970 implements the Environmental Impact Statement law, as outlined in the Hawaii Revised Statutes Chapter 343 (HRS §343). Legal and procedural time limits are established within the law. For example, the OEQC must inform the public of the availability to review and comment on a draft environmental assessment for which a finding of no significant impact is anticipated and also in cases where they are anticipated, for a period of thirty days for the former and forty-five days for the latter (see Table 3). The opportunity to request dispute resolution services instead of taking the matter to court is also presently a part of the law.



Jamaica's EIA legislation was enacted in 1991 as part of a comprehensive environmental legislation, the NRCA Act of 1991 (Act 9 of 1991). Section 10 of the Act enables the Natural Resources Conservation Authority (NRCA) to require an EIA in respect of development in a prescribed area. There is only one agency responsible for administering the rules as they relate to section 10, the NRCA. This authority was merged with two other state agencies to form the National Environmental Protection Agency (NEPA) in 2001. Whereas Hawaii's legislation was state-level, Jamaica's is national. The aggrieved party (public or proponent) has twenty-eight days from the date of a decision to file an appeal in writing to the Minister with responsibility for the environment. There are procedural time limits but they are only in the form of guidelines, as such, they are not binding by law. There are no provisions in the law to request dispute resolution services.

Hawaii has full compliance with each of the four criteria for EIA legislation. Jamaica has partial compliance in two criteria and full compliance in two. Although Jamaica only partially meets the criteria for legal provisions, and legal and procedural time limits, there is evidence of improvement. Jamaican EIA laws are not legislatively similar to the Hawaiian state EIS law. Although, Jamaican EIA rules are apart of a comprehensive environmental legislation, there are still too many aspects of the process that are not legally binding.

**Table 3: Performance of EIA systems against systemic measure evaluation criteria**

No. Evaluation Criteria: Systemic Measures	Jamaica	Meets criterion ●○○	Hawaii (US)	Meets criterion ●○○
<b>1.0 EIA legislative Provisions</b>				
1.1 Legal provisions for EIA	NRCA Act 1991; EIA in section 9 of framework legislation, no specific EIA law	○	Enabling legislation: Law No. HRS § 343, 1974; specific EIA legislation	●
1.2 Level of government	National	●	State	●
1.3 Provisions for appeal by the developer or the public against decisions	Appeal to Minister within 28 days of date of decision	●	60-day period during which an aggrieved party may challenge the determination in court	●
1.4 Legal or procedural specification of time limits	Procedural time limits in EIA procedural guidelines, appeal time limits for public and/or developer specified in legislation	○	Time limits for decision on EIA and appeal by public and/or developer specified in legislation	●

Table 3: Performance of EIA systems against systemic measure evaluation criteria (continued)

No. Evaluation Criteria: Systemic Measures	Jamaica	Meets criterion ●○○	Hawaii (US)	Meets criterion ●○○
<b>2.0 Administrative Provisions</b>				
2.1 Authorized agencies and their respective powers and functions (Competent authority for EIA and determination of environmental acceptability).	Lead agency: NRCA (1991-2001), NEPA (2001-present)	●	Office of Environmental Quality Control and the Environmental Council	●
2.2 Provisions for EIA Guidelines	Provided for in NEPA regulations	●	Provided for in HRS regulations	●
2.3 Provisions for technical guidance for various types of development	Initial screening and scoping used to determine if project requires an EIA	●	Initial screening and scoping used to determine if project requires an EIA	●
2.4 Review body for EIA	NEPA: uses staff and independent reviewers, other governmental agencies	●	Accepting authority determines the acceptability of a final EIS.	●
2.5 Level of coordination mechanisms for EIA implementation with other agencies.	Occasional meetings and informal liaison with other agencies conducted on an ad hoc basis.	⊕	Occasional meetings and informal liaison with other agencies on a regular basis	●

**Table 3: Performance of EIA systems against systemic measure evaluation criteria (continued)**

No.	Evaluation Criteria: Systemic Measures	Jamaica	Meets criterion ●○○	Hawaii (US)	Meets criterion ●○○
<b>3.0 EIA Procedural Provisions</b>					
3.1	Specified screening categories	Prescribed categories of projects requiring an EIA (24 different types listed)	●	Notice of determination on the need for an EIS. 8 types of trigger actions	●
3.2	Systemic screening approach	Screening lists	○	List with thresholds and lead agency screening	●
3.3	Systemic scoping approach	Guidance in scoping by NEPA, standard terms of reference (TOR)	○	Lead agency defines scope with developer	●
3.4	Requirement to consider alternatives	Required in EIA guidelines	●	Required in EIA guidelines	●
3.5	Specified EIA report content	Generic and general guidelines specifying coverage of EIA. Additional requirements specified for individual TOR	●	Generic and general guidelines specifying coverage of EIA	●

Table 3: Performance of EIA systems against systemic measure evaluation criteria (continued)

No. Evaluation Criteria: Systemic Measures	Jamaica	Meets criterion ●○○	Hawaii (US)	Meets criterion ●○○
<b>3.0 EIA Procedural Provisions cont.</b>				
3.6 Systemic EIA report review approach	Review by independent reviewers and NEPA. NEPA has final say	●	Must be approved by the government agency with permitting power over the project. For agency action environmental assessments, proposing and approving agency are one and the same. OEQC may advise government agencies on the acceptability of environmental review documents but does not have the final say	●
3.7 Public participation (PP) in EIA process	Guidelines for PP consultation during EIA study. NEPA recommends PP at end of study depending on level of controversy or sensitivity. Two main public participation periods. The first is the consultation period prior to the development of a draft EIS (the EIS preparation notice stage), and the second is the review period after the submittal of the draft EIS.	○	Three public participation periods. The first is the consultation period prior to the development of a draft EIS (the EIS preparation notice stage). The second is the public comment period on draft environmental assessments, and the third is the review period after the submittal of the draft EIS.	●

Table 3: Performance of EIA systems against systemic measure evaluation criteria (continued)

No.	Evaluation Criteria: Systemic Measures	Jamaica	Hawaii (US)	Meets criterion	Meets criterion
<b>3.0 EIA Procedural Provisions cont.</b>					
3.8	Systemic decision making approach	NEPA gives project approval	Final EA must be approved by the government agency with permitting power over the project.	●	●
3.9	Requirement for environmental management plans	General requirements in EIA guidelines	General requirements in EIA regulations	⊙	●
3.10	Requirement for mitigation of impact	General requirements in EIA guidelines	General requirements in EIA law	●	●
3.11	Requirement for impact monitoring	Procedural requirement	Monitoring Plan required by law. Different government agencies and/or developers required to undertake monitoring.	⊙	●

[Level of adoption/implementation of evaluation criteria: ●, fully; ⊙, partially; ○, non-existent]

H2: Jamaican administrative, procedural, and foundation measures will be weaker than those in Hawaii.

### *Administrative Provisions*

The administrative provisions of both systems are defined in existing regulations and procedures. Each country has specific agencies responsible for administering the EIA process (see table 3).

In Hawaii, there are two authorized agencies responsible for the development and management of the State's EIA system. The Environmental Council advises the State on environmental concerns. The Council is mandated by law to monitor the progress of state, county, and federal agencies in achieving and formulating environmental goals and policies. The Environmental Council publishes a report each year per the law advising state policy makers on important issues affecting Hawaii's environment, and it also adopts the administrative rules governing the EIS process. The other state agency, the OEQC, stimulates, expand and coordinate efforts to maintain the optimum quality of the State's environment. EIA guidelines are provided in EIS law, and Hawaii Administrative Rules (Chapter 11-201 HAR). There are also provisions for technical assistance for various types of developments through screening and scoping with the OEQC and project proponents.

The accepting authority for a project in Hawaii varies. Actions proposed by the State are accepted by the Governor, those proposed by a county are accepted by the mayor of that county, and those proposed by private individuals or persons are accepted

by the state or county agency receiving the request for approval to implement the proposed action. Review authorities are independent from the project proponents or authorized authorities. Office planners of accepting authorities are responsible for reviewing and commenting on environmental disclosure documents each year. A bulletin, the Environmental Notice, is published semi-monthly informing the public of all the projects being proposed in the State that are subject to public review and comment.

In Jamaica, the NRCA is responsible for implementing the institutional provisions of EIA legislation. This Authority is an executive agency with wide environmental responsibility. The NRCA is responsible for the protection of the physical and biological environment to ensure conservation, protection and the proper use of the island's resources. An executive agency, NEPA, was created in 2001 through a merger of three state agencies. Provisions for EIA guidelines exist in Jamaica but only as guidelines. They are not legally binding. There are also provisions for technical assistance for various types of developments through screening and scoping with NEPA and project proponents.

The accepting authority for a project in Jamaica is NEPA. The guidelines for reviewing EIA in Jamaica are administered by NEPA. NEPA staff and a technical committee review EIA documents. Where projects are controversial independent reviewers and other governmental agencies are incorporated in the review process. A Permit & Licence (P&L) Secretariat was created in 1999 to provide an effective means of contact with the permit applicant. EIA guidelines created by the state agency include: the Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise,



Construction and Development) Order, 1996 and the Permits & Licensing Regulations which are legally binding, and Guidelines for Conducting an EIA, Project Proponents, and Public Presentations in 1997. Coordination mechanism for EIA implementation with other agencies exists on an ad hoc basis only.

### *EIA Procedural Provisions*

Table 3 provides a comprehensive summary of the EIA procedural provisions in EIA systems in Hawaii and Jamaica. This section addresses the screening, scoping, review, public participation, decision-making, environmental management plans (EMPs), and mitigation and monitoring protocols.

The Hawaiian system has eight types of actions that may “trigger” the environmental review law. These include:

1. projects that propose the use of state or county lands or funds;
2. land in the conservation district;
3. land in the shoreline setback area;
4. any historic site or district; or
5. land in Waikiki must be subject to an environmental review prior to its implementation.
6. Also, any proposed reclassification of conservation land may trigger an environmental review,
7. amendment to a county general plan, and
8. any new or expanded helicopter facility.

Even though a project may trigger one of the above actions, the preparation of an environmental review document is not necessarily required. There are 10 classes of proposed activities considered routine and minor in scope such as minor alterations in the conditions of land, water, or vegetation, and basic data collection, research and experimental management. Screening and scoping of projects is done using a list of thresholds by the lead agency and project proponent in consultation with other relevant agencies. Requirement to consider alternatives and the content of an EIA are provided by the EIS law. The OEQC's publishes an environmental assessment checklist that itemizes the important areas that a statement should follow in the *Environmental Guidebook*. The EIS must be approved by the government agency with permitting power over the project. A notice of determination is issued by an agency and accompanies a final environmental assessment. The determination states that the action will either have no significant impact (a FONSI, Finding of No Significant Impact) or may have a significant impact. Where the document is an agency action, the environmental assessment, proposing and approving agencies are one and the same. The OEQC may advise government agencies on the acceptability of environmental review documents but does not have final say on any report.

There are three public participation periods in the Hawaiian EIA system. The first is the public comment period on draft environmental assessments. The second is the consultation period before a draft EIS (the EIS preparation notice stage) is prepared. The third is the review period after the submittal of the draft EIS. The draft EIS is circulated to public libraries and other parties, and a 45-day public comment period is provided.

OEQC is the legal repository of all environmental review documents (draft and final EAs, draft and final EISs). These reports can be obtained from the OEQC or libraries for public review. The final environmental assessment must be approved by the government agency with permitting power over the project. Requirement for EMPs, mitigation of impacts, and impact monitoring are provided by the EIS law.

In Jamaica, lists of prescribed categories are found in Annex A of the NRCA Act that defines which activities require an EIA. The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order of 1996 outlines the full breakdown of Annex A, and was formally in 1997. The screening of projects starts with the Project Information Form (PIF), which a proponent must attach to any permit/license application. The PIF is the basis for the determination and approval of the Terms of Reference (ToR) that outlines the contents of the environmental assessment. Internally, NEPA staff uses a form called the "Environmental Screening of Projects" to help make determinations (Somers 1999). This decision takes approximately ten days. Standardized ToRs are used for projects of a given type, and are submitted for review and approval prior to the start of any EIA study. An environmental consultant firm is usually used by applicants to carry out an EIA study.

The draft environmental assessment is submitted to NEPA where it's first reviewed by the relevant technical unit such as the Coastal Zone Management Unit. It is then sent out to relevant government agencies and local area NGOs by NEPA. The document is then circulated to public libraries and other parties, usually within or near the affected area at the discretion of NEPA. Notices are published in the press. There

are two recognized public participation periods in the Jamaican EIA process. The first is the consultation period prior to the development of a draft EIS, and the second is the review period after submission of the draft EIS. NEPA is the only state agency mandated to approve an EIS. NEPA attempts a 90-day EIA review and decision-making process. There are general requirements for consideration of alternatives, EMPs, mitigation of impacts, and impact monitoring are covered by general guidelines. These guidelines are not legally binding.

#### *Foundation measure*

The foundation measure criteria considered in this study speak to the existence of EIA guidelines, EIA system monitoring, expertise in conducting EIAs, EIA training and capacity development.

Hawaii has developed EIA general and sectoral guidelines. EIA general guidelines are described in the EIS law and in guidance documents and protocols published by the OEQC (see table 4). The OEQC prepares these guidelines in the form of draft EA checklists, and only exist as a policy; it is neither law nor rule. Preparers of EISs are recommended to adopt these standards. The Environmental Council approves an agency's exemption list of minor activities that can be implemented without first preparing an Environmental Assessment (EA). The OEQC is mandated to implement the provisions of Chapter 343 of the Hawaii Revised Statutes and as such they undergo routine evaluation of the EIA system. EIS system monitoring is achieved through periodic updating of documents and addition of new documents where necessary. The

Environmental Council also advises state policy makers on important issues affecting Hawaii's environment and as such are instrumental in monitoring the EIA system of Hawaii. There are EIA expertise in universities, research and training institutions and consultancy firms. The University of Hawaii is outlined in the HAR as an affected agency and/or advisory committee. There are highly qualified technical experts in Hawaii. There are also adequate capacity for development of EIA in Hawaii through the University of Hawaii and other institutes.

Jamaica has developed general and sectoral EIA guidelines. The EIA general guidelines are not described in the NRCA Act (see table 4). Instead the EIA guideline documents are published as administrative documents that only exist as policy; they are neither law nor rule. Preparers of EISs are recommended to adopt these standards. There is no existing EIS system monitoring provision by law in Jamaica. EIS system monitoring is achieved through ad hoc updating of documents and addition of new documents where necessary. NEPA is the only agency in Jamaica that monitors the EIA system of Jamaica. EIA expertise is available at local universities primarily the University of the West Indies, and consultancy firms. There are highly qualified technical experts in Jamaica, primarily as consultants. However, it should be noted that foreign consultants are also incorporated. Capacity development and training are inadequate in Jamaica. This can be attributed to the lack of finances on the part of Government agencies for regular training capabilities. Jamaica relies a lot on funding programs provided through international agencies, such as United Nations Environmental Program (UNEP) and Canadian International Development Agency (CIDA).

Table 4: Performance of EIA systems against foundation measure criteria

No. Evaluation Criteria: Foundation Measures	Jamaica	Meets criterion ●○○○	Hawaii (US)	Meets criterion ●○○○
1.0 Existence of general and/or specific guidelines	Guidelines issued by NEPA such as those for conducting an EIA and public participation	●	Guidelines for an EIA issued by OEQC	●
1.1 EIA system implementation monitoring	Informal practice	⊙	Formal practice	●
1.2 Expertise in conducting EIA (national universities, institutes, consultancies with EIA technical expertise)	No constraint – Small number of consultancy firms, local universities (e.g. University of the West Indies)	⊙	No constraint -- lead agency responsible, University of Hawaii, training institutions	●
1.3 Training and capacity-building	Limited training programs. Mainly funded through international agencies e.g. UNEP	●	Training programs funded by agencies (both government and non-governmental)	●

### Summary of trends

Jamaican administrative, procedural and foundation measures are not entirely weaker than those in Hawaii. Administratively and procedurally EIA process in Jamaica is not totally mandated by law. Most guidelines published are neither rule nor law, simply guidelines that project proponents are recommended to follow. Foundation measures are weak mainly due to financial constraints of the government agency; NEPA. Jamaica's administrative, procedural, and foundation measures are weaker than Hawaii's. The weaknesses in the Jamaican system largely stem from the inadequacies in the legislative structure and the financial constraints of the lead agency, NEPA.

Coordination between agencies in Jamaica is not as strong. This weakness, as well as to improve efficiency, was possibly the driving force behind the merger of three state agencies to create one executive body. Procedurally, systemic screening and scoping measures are weaker, so also public participation in the EIA process. The requirements for environmental management plans and monitoring have been implemented only as an administrative requirement. This undermines the effectiveness of the process in Jamaica compared with Hawaii, where these are all legislatively administered.

## Research area 2: Public participation

H1. Jamaica's 1997 public participation guidelines improved actual participation in EIA practice.

Overview: In terms of quantity of comment letters/public inquiry very little was documented. Of the 8 reports none detailed the number of comments or comment letters received. Where comments were recorded, only local area NGOs and planning agencies were involved throughout the process; direct resident involvement was rare only documented in cases where the project was considered controversial (see table 5). However, the quality of comments made could be evaluated.



<b>Table 5: Summary of public participation in 8 EIA reports</b>						
Reports/Year	Public participation (Some/None)	Area of participation allowed/documented				Public meeting or hearing
		Terms of reference	During the assessment process	After submission of draft EIA		
<b>Pre-Guidelines Period (1991-1996)</b>						
Real Negril Hotel (1992)	Some	No	Yes	Yes	Yes	Yes
Proposed Vendors Arcade (1993)	No information found	Not in EIS	No information found	No information found	No information found	No information found
Couples Negril Hotel (1996)	Some	Yes	Yes	Yes	insufficient information found	
Commercial Complex, Negril (1996)	None information found	Not in EIS	Yes	No information found	No information found	
Sea Splash Plantation Resort (1996)	No information found	Not in EIS	No information found	No information found	No information found	
Negril Harbor Hotel (1996)	No information found	Not in EIS	No information found	No information found	No information found	
<b>Post-Guidelines Period (1997-Present)</b>						
RIU Tropical Bay Hotel (1999)	Some	Yes	Yes	Yes	Yes	Yes
RIU Bloody Bay Hotel (1999)	Some	Yes	Yes	Yes	Yes	Yes

*Pre-guideline period (1991-1996)*

Of the two reports submitted in this period, both in the Long Bay area, one showed some record of public involvement in the process, the Real Negril Hotel (1992) (see table 5). A socio-economic survey was carried out for the Real Negril Hotel which provided information on the proposed development. The report itself contained an appendix with copies of newspaper clippings highlighting the public's stance towards the project, which was mixed (both for and against).

A public hearing was held for the Real Negril project in June 1992 at the discretion of NRCA. At this meeting a proposal was put forward for the International Union for Conservation of Nature and Natural Resources (IUCN) to review the EIA, but the proposal was turned down by the NRCA. The project log at the NRCA provided the only documentation of this meeting. No verbatim report of the meeting was found, nor was the numbers of comments/letters, if any, received following this meeting. Major pressure against the project was mounted in 1995 when ground apparently was broken for the development, as evidenced by the numerous comments made in the press that were catalogued in the final EIA. This outcry was largely in reference to the continued water supply problems being experienced by residents and business in the area. In September 1996, a local government agency, the Negril and Green Island Area Local Planning Authority (NGIALPA) requested a copy of the EIA and the analysis done by the lead agency, NRCA, but no further correspondence was placed into the record.

In the period after the ban on developments was lifted, four EIA reports were submitted for review. At this time the guidelines or ideas behind the guidelines were

known by most EIA practitioners in the Island (NRCA 1997; Smith 1999), however they had not been formally adopted. Of the four projects only one, Couples Negril Hotel, showed any documentation referring to public involvement during the process in the transcripts and letters held at NEPA. Inquiries were made regarding housing, water supply and other issues by other hotel interests in the area and residents to a lesser extent as witnessed by the few comments made at public hearings. After submission of the report, comments were solicited from the local area NGOs, but none were received.

Two planning agencies became involved during the latter period of the project: the Urban Development Commission (UDC) the agency that has control of government lands in the area, and NGIALPA. No records were found documenting a public hearing or other public involvement for the Couples Negril Hotel project. Of the other three projects, two hotels and a commercial complex, no documentation of public involvement in the process before or after submission of the report was found. Two of the hotel projects are located in the Bloody Bay, area including the Couples Negril Hotel, while the third Negril Harbour Hotel is located in the Long Bay area. The commercial complex is located at the town center.

#### *Post-Guidelines Period (1997-Present)*

Two tourism-related reports have been submitted for the Negril Area after the public participation guidelines were formally adopted in 1997. The RIU Tropical Bay Hotel was approved in 1999, and the RIU Bloody Bay Hotel was approved in 2001. These two developments had more public involvement both during and after the EIA

process than did any of their predecessors. Both these hotel projects represented larger scale developments than previous hotels, with 100 rooms more than the Real Negril Hotel with 300 rooms proposed in 1992. The RIU Tropical Bay Hotel proposed 396 rooms and the RIU Bloody Bay Hotel 420 rooms.

The RIU Tropical Bay Hotel EIA report included participation from the ToR stage by at least one local area NGO, the Negril Environmental Protection Trust (NEPT) commenting. This was chronicled in the project files housed at NEPA. The initial comments raised several areas of concern such as erosion hazard and sediment control along the marine boundary, socioeconomic concerns (housing, sewage, solid waste etc.). These comments were addressed during the document process and reflected in the EIA report submitted. After submission, NEPT reviewed the EIA report and pointed out areas where corrections were necessary and made recommendations. They also highlighted the loss of flora and fauna as being significant and irreversible considering all land in the Long Bay area held by government was destined for development. A public hearing was carried out and was documented, in accordance with the guidelines. At least twenty five (25) persons were in attendance. Those in attendance represented government interests, hoteliers and businessmen, local area community groups, and residents of the area. The major issue was the lack of availability of the EIA for public scrutiny prior to the meeting. The lead agency and consultants acknowledged this error, blaming miscommunication between the two entities as the source. However, this is the only record of this error being addressed.

The RIU Bloody Bay report garnered significantly more public input than all previous reports. This proposed development was to be carried out in an environmentally sensitive area, and it aroused significant controversy similar to the RIU Tropical Bay project. The ToR addressed the need for public participation at an early stage, with local area agencies addressing the historical heritage perspective. Two NGOs and one agency commented on the Bloody Bay project at the ToR stage as opposed to just one for the Tropical Bay Hotel. NGOs commenting were NCRPS, NEPT, and NGIALPA as the lone governmental agency commenting. NCRPS and NEPT stressed the need to ensure public meetings are held with the Negril community and continued collaboration with local area NGOs. They were also not in agreement with more development along the Bloody Bay shoreline, and urged the use of improved methods for assessing the flora and fauna of the area.

During the EIA scoping and drafting process, NEPT put forward strong views against the project, considering the significant impacts to the fish nursery and the last stand of red mangroves in that area. The design layout of the property had suggested its footprint falling within these protected areas. The NRCA responded to these comments pointing out that the modification of any sea grass beds and wetlands are regulated under the NRCA Act of 1991 and as such would be illegal if approved by the NRCA. NGO and lead agency collaboration with developers (through their consultants) continued throughout the documenting of the report. The report was submitted in November of 2001. In reviewing the EIA, the same organizations were once again involved. The EIA was reviewed by NGOs and the local area planning agency. The areas that were still of

concern were: impact on sea grass beds/fish nursery, the need for a comprehensive tree preservation plan, dust and debris pollution, enforcement of guidelines, the preservation of the last stand of red mangroves and adjacent sea grass beds (which was omitted in report), potential zoning conflicts within the Negril Marine Park, and the need for a more intensive terrestrial study. Based on these comments the lead agency made several revision comments in its response to the consultants on their draft EIA in January of 2002.

A public hearing was conducted in February 2002. The number of participants was not apparently recorded, but those in attendance represented a wide range of interests. Questions and comments posed addressed the following areas: lack of community involvement, the destruction of plants and sensitive habitat at the first resort, tree order rules not followed, suggestion of developers doing self policing of NO<sub>3</sub> many mitigations unacceptable, issue of impacts to fish sanctuary and zonation, current carrying capacity versus cumulative impact from future development, green globe certification, sedimentation and coral reefs, lead agencies capability to provide enforcement through development process, issues of social impacts on use of beach frontage, and who would providing monitoring for coastal water quality, beach profile, and waste water treatment. A follow up to the public hearing was done by the Negril Chamber of Commerce, suggesting the lead agency address the following issues: Negril Marine Park as a protected area, beach erosion and absorption pits accommodating water run-off.

### Summary of trends

Of the eight projects reviewed records of public participation were only kept for four of them. Public participation which was minimal during the period 1991-1996 has increased in project EIAs in the Negril area following the adoption of the 1997 guidelines. There has been more and continued participation from members of the public, whether they are local area NGOs or the residents of the affected community. Not all projects were subjected to a public hearing after a project EIA was submitted due to the discretionary power of the lead agency.

Jamaica's 1997 public participation guidelines improved actual participation in EIA practice. Although actual public participation was improved, there were not enough documents reviewed after the 1997 guidelines to make this a significant finding. Also, it may be due to the fact that both reports were considered controversial by NEPA.

Research area 3: The effect of public participation on document quality

H1. Document quality prior to Jamaica's 1997 EIA guidelines is lower than document quality post 1997 EIA guidelines.

*EIA Document Quality (pre and post 1997 guidelines)*

A summary of the review of the results gained from the application of the Lee-Colley review checklist to the EISs revealed no report scored a B (generally satisfactory and complete) or above, both overall or in each review area. The checklist is divided into 4 sections and within each section there are several individual review criteria. In all, the checklist assesses the quality of EISs against 53 criteria, some of which were not necessarily relevant to all projects. Each criterion is letter graded on the basis of the quality of the material provided and each section is then awarded an overall grade as previously stated in table 1. From the letter grades given to each section an overall grade for the EIS was arrived at.

Review area 4, communication of results, was the most satisfactorily performed, followed by review area 1, description of the development, the local environment and the baseline conditions. Review area 3, alternatives and mitigation, was the least satisfactorily performed area. Reports submitted prior to the National Water Commissions' development freeze (pre-moratorium) were well attempted for the most part, but could be considered unsatisfactory because of omissions and/or inadequacies. The post-moratorium period saw four reports being submitted in one year. These reports were on slightly better prepared but were still fraught with omissions and inadequacies. The most current reports were better prepared. One advantage of the current reports is



the more inclusive aspect of public participation. These reports performed just satisfactory or better in all review areas. Overall, the reports that performed just satisfactory were rated C or higher (see table 6).

Table 6: Summary of the quality of the EIA reports reviewed as self contained documents

No	EIA Report	Date of EIA Report	Overall Quality	Overall Quality of Review Areas			
				1	2	3	4
<b>Pre 1997 Guidelines</b>							
1	Real Negril Hotel	October 1992	C	B	C	D	C
2	Proposed Vendors Arcade	March 1993	D	D	D	E	D
3	Couples Negril Hotel	January 1996	C	B	B	E	B
4	Commercial Complex, Negril	April 1996	D	D	D	D	C
5	Sea Splash Plantation Resort	September 1996	D	C	D	E	B
6	Negril Harbor Hotel	December 1996	D	D	E	E	C
<b>Post 1997 Guidelines</b>							
7	RIU Tropical Bay Hotel	June 1999	C	B	C	C	C
8	RIU Bloody Bay Hotel	November 2001	C	B	C	C	B

*Review area 1: Description of the development, local environment, and baseline conditions*

The majority of the projects scored a C, just satisfactory, and above in describing the physical characteristics, scale, and design of the project. The purpose and objective of each development were adequately explained, with all statements receiving a B (generally satisfactory and complete) and higher. All reports received a C (just satisfactory) with regards to the effective use of diagrams, charts and/ or maps. The design, size or scale of the developments, along with the duration of construction and operation activities was all effectively outlined, with only a few minor omissions. Four reports outlined the building footprints. At least 3 of 8 reports were just satisfactory or worse in describing the environmental planning that went into the project to minimize negative environmental effects. Only two reports captured potential positive benefits. Design features for environmental planning and socio-economic management were only adequately highlighted in three reports as being better than satisfactory.

The physical presence or appearance of the completed development within the receiving environment was well attempted by most, however most had omissions or inadequacies. More than half the reports, 5 of 8, were inadequate in describing the nature of and quantifying the materials needed during construction and operational phases, and as such were unsatisfactory. The numbers of workers involved with the project during both construction and operation were estimated in at least half the reports. The location of the area taken up by the developments and location were generally satisfactorily performed by 6 reports. The different land uses are highlighted satisfactorily in 6 reports

through landscape design maps. However all reports performed poorly on alternate design plans or sites, seven scoring an F (very unsatisfactory or not attempted).

Only 3 reports recorded better than a C in documenting the types and quantities of residual and/or waste matter that will be generated by the developments. Uncertainties were not documented in most reports. At least five reports indicated the proposed routes for treatment of waste. Appropriate boundaries to the study area were more than satisfactorily done. Suitable scaled maps were used in seven reports, and the affected environment broadly discussed at a satisfactory level to allow for potential effects such as traffic pollution. However, all projects performed just satisfactory or worse in the time horizon attributed to accounting for delayed effects.

The baseline conditions were adequately performed in at least 6 reports. The important aspects of the affected environment were identified and the methods and investigation appropriate to the size/scale of the projects. None of the reports identified uncertainties. Existing data sources were used in all cases, including local land use and development plans. All but two reports failed to adequately identify the probable future state of the environment in the absence of the project, taking into consideration natural fluctuations and human activities.

#### *Review Area 2: Identification, Analysis, and Assessment of Impacts*

The identification of impacts was more than satisfactorily done with at least four reports averaging a B. All important issues in the terms of reference (ToR) were accounted for in the reports at a just satisfactory level for six reports. At least seven

reports used a project specific checklist or matrices in identifying impacts. Expert judgments were relied on in all projects. Sensitive areas such as endemic plant species, turtle nesting sites, and fish nurseries were identified just satisfactorily in five reports. The others fail due to significant omissions or inadequacies. Cumulative impacts were considered in only two reports. Potential impacts from accidents such as oil spills were well documented in all the post moratorium reports. No report considered decommissioning as all projects were assumed to last into perpetuity. Key impacts such as habitat loss, sea turtle nesting site protection, and provisions for endemic species were selected for intense investigation. Scoping methods used were not adequately identified in any of the reports.

Analyses of impact severity were just satisfactory in most cases. Impacts as a result of the developments were proposed but hardly any of the reports outlined environmental conditions were the project not to go ahead. Data used to estimate severity of impact was largely insufficient with 5 reports scoring a grade of C or lower. Only three reports used aspects weighting and standardizing in their estimates or referred to some threshold. At least five reports explained the methods they used adequately, but all did a poor job of outlining assumptions and limitations of the methods expressed. No report considered reversibility of impacts adequately. Estimates of impacts recorded lacked proper ranges and/or confidence limits, in some cases qualitative descriptions were not adequately defined. As such, no report scored better than a C with at least one report not attempting it.

The significance of impacts remaining after mitigation measures were put in place were addressed in most cases as well as the use of some acceptable quality standard, whether it be national or international. At least five reports made no mention of economic values attributed to environmental cost and benefits. None used a cost-benefit analysis of the environment in their assessment. The affected social structure was outlined in all reports whether it is residents, government agencies or commercial groups.

### *Review Area 3: Alternatives and Mitigation*

Project alternatives were identified in at least five reports as changes to locations of some structures. However none considered different sites even though there are other sites in the area that are zoned for resort/commercial development. No alternative construction strategies were considered in any projects. Only four projects showed any adequate consultation of concerned stakeholder, particularly the most current reports. No report scored higher than a C for residual or unmitigated impacts. At least five reports scored an F, poorly done or making no attempt. No training needs were identified; neither costs of the programs estimated. Developer and government responsibilities were distinguished in most reports but lacking in adequately explained reporting and review procedures. Two reports proposed commitments to mitigation scoring a C (just satisfactory). Five reports scored an E or lower for significant omissions or inadequacies in commitment and capability in carrying out mitigation measures.

#### *Review Area 4: Communication*

Public involvement was poorly recorded in seven reports. Only one report mentioned the use of methods such as questionnaires to provide an input from the wider public in the area. The layout of the report was very well done by all reports. All reports describe the projects well, along with the aims of the assessment. Information was logically arranged following the outline suggested by the lead agency, NEPA/NRCA, with most scoring a B or higher. Only five reports identified the study teams and their qualifications (see table 7).

**Table 7: Quality of study teams in each report.**

Title of EIA Report/Year	No. in Team	Quality of Study Team			PhDs
		BA/BSc	Masters		
			M.Phil	M.Sc./MA	
Real Negril Hotel (1992)	0		<i>None documented</i>		
Proposed Vendors Arcade (1993)	2	Zoology			Wildlife Management expert and Ornithologist
Couples Negril Hotel (1996)	5	Botanist	Environmental Geologist, Environmental Chemist, Zoologist	Marine Geologist	
Commercial Complex, Negril (1996)	6	Civil Engineer	Ecologist	Geographer, Ecologist, Geologist, Physical Planner	
Sea Splash Plantation Resort (1996)	0		<i>None documented</i>		
Negril Harbor Hotel (1996)	0		<i>None documented</i>		
RIU Tropical Bay Hotel (1999)	5		Marine Biologist	Civil Engineer, Geologist, Environmental Scientist/Biologist	Terrestrial Ecologist
RIU Bloody Bay Hotel (2001)	6		Environmental Scientist, Botanist & Wetland Specialist	Hydro-geologist, Coastal Engineer, Marine Biologist	Terrestrial Ecologist

A full reference was provided in seven reports. Original source of data was also acknowledged within the reports of those seven. Information is understandable to most non-specialists but not necessarily the lay public. Tables, graphs, and graphics were well represented. Seven reports had glossary explaining technical terms and acronyms. The reports were balanced in most scoring a grade of C or better. Only five statements were better than satisfactory (a grade of B or higher) in terms of degree of bias. Two reports lobbied for the developers view, scoring a grade of E or lower. Five reports received a score of C or higher for an adequate non-technical summary of the analysis and main findings. Appendix H summarizes the performance of all projects against the review package for all areas.

#### Ecological Assessments in EISs: Pre-Guideline Period (1991-1996)

Appendix C outlines the checklist criteria used to evaluate the adequacy of the environmental assessment provided in each EIS for all eight projects. The checklist is divided into 5 sections and within each section are a number of individual review criteria. In all, the checklist assesses the environmental assessment of EISs against 55 criteria.

#### *Descriptive statistics in projects*

The Real Negril Hotel adequately addressed the general descriptive statistics on the project. The Real Negril Hotel was a high impact project, a 300 room hotel resort on 8.2 hectares. The geographical extent of the project, acreage of entire site and building



footprint were indicated (see table 8). The settings surrounding the site at the time of the project were also outlined, including the existing land use. The protected areas in the vicinity of the site were also outlined: the Negril Marine Park and the Negril Morass. The Real Negril Hotel EIS however, did not mention the qualifications of or the number of individuals in the study team.

The Proposed Vendors Arcade was inadequate in addressing the general descriptive statistics on the project. The Proposed Vendors Arcade was a project of 54 vendor stalls on approximately 0.004ha in size (see table 8). The geographic extent of the Proposed Vendors Arcade was poorly identified. The map used had an arrow pointing to no exact location. The building footprint was not identified in the report even though mention was made of a design structure and map. In both cases the site was disturbed coastal woodland surrounded by marine influences and a protected wetland. The Proposed Vendors Arcade was cleared of vegetation prior to any ecological assessment, and crushed limestone (marl) used to cover the site. This was a direct violation of existing planning regulations.

The three hotel reports submitted in 1996 provided satisfactory descriptive statistics. They ranged in size from 5 to 7.6 hectares and 200 to 252 rooms (table 8). The geographical extent of the Couples Negril Hotel site adequately outlined on land use maps of the area. The total acreage of the site and the building footprint were also documented in the report as well as the existing setting and surrounding land uses. The qualifications of the five members in the study team were also documented (table 6). The Sea Splash Plantation Resort and the Negril Harbour Hotel had few omissions in this

category. Both EISs had no information on building footprint within the project site. The geographical extent of the Sea Splash Plantation Resort was inadequate in that the consultants used of hand drawn maps. The study team and their qualifications in the Sea Splash Plantation Resort and Real Negril Hotel reports were not included in either report. The lots of all three hotels showed signs of illegal sand mining and tree felling. All three project site are surrounded by hotels, the marine park, a major roadway, and a protected wetland. The Commercial Complex project had minor omissions as well. The geographical extent of the site was indicated on maps that had no scale, and surrounding land use was vaguely described, despite being in the center of the town of Negril. The study team and their qualifications were adequately represented.

Table 8: Summary of the descriptive statistics of the project sites

Reports	Size		Comment
	Total area (in hectares)	Total building footprint (in m <sup>2</sup> )	
<i>Pre-Guideline Period (1991-1996)</i>			
Real Negril Hotel	8.2	Not reported	300 rooms
Proposed Vendors Arcade	0.004	Not reported	54 stalls
Couples Negril Hotel	6.6	22,566	252 rooms
Commercial Complex, Negril	1.215	15,434	--
Sea Splash Plantation Resort	7.585	Not reported	237 rooms
Negril Harbor Hotel	5	Not reported	200 rooms
<i>Post-Guidelines Period (1997-present)</i>			
RIU Tropical Bay Hotel	8.729	80,363	372 rooms
RIU Bloody Bay Hotel	9	89,012	420 rooms

*The state of rare, threatened, endangered, and endemic species.*

There were 51 flowering plant species (195 trees and 120 palms) excluding orchids and bromeliads on the Real Negril Hotel site (see table 9). The list included 6 endemic plant species, one restricted to western parishes, *Roystonea princeps*. Three vegetation zones were also identified: backshore, central and hurricane damaged. All plant species were identified using a tree survey, transects and relative abundance/DAFOR rating scale. The Proposed Vendors Arcade had 26 plant species on site, all weedy species. All brush and trees were removed and the site was covered with crushed limestone (marl) prior to the EIA being conducted.

There were 10 bird species recorded for the Real Negril site of which 5 were endemic species. Birds were identified by sight and call along with the use of references; all were found to be common in the area. All other terrestrial fauna were identified through ad hoc basic observations; 4 butterfly species were significant species on site. Neither report attempted to identify and estimate the presence of threatened, rare, endangered keystone/indicator, and exotic/alien species. Site visits were minimally conducted, only 2 or 3 per site, all within a month. The marine component covered animal and plant species found in three zones; foreshore, inshore and seagrass area. Two coral species, two seagrass species, two sea urchins, two sea stars, one burrowing shrimp, one mollusk species, and seven fish species. No methodology or sampling times for the marine component were detailed in the report.

Of the three hotel projects evaluated for 1996 only two attempted to quantify the number of animal and plant species. The Sea Splash Plantation Resort site was cleared

and marled prior to the EIA being conducted; however the report documented 8 species of plants; no bird species record was found in the report. The Couples Negril Hotel report documented 36 species of plants on site, of which 5 were endemic and 1 rare, while the Negril Harbour Hotel site report found 24 plant species of which 6 were endemic and 1 protected/endangered. One bromeliad species was recorded for the Couples site. Vegetation was surveyed by a walk-through tree survey; no transects were taken. Trees were recorded using diameter at breast height (dbh). There were 36 bird species recorded on site, of which one was nationally rare and 8 ranked rare on-site. Point-counts of birds were taken in the early morning only and identification done by sight or call. There were 9 species of butterflies (2 rare) found by random sampling, and other incidental fauna on the Couples site.

A snorkel survey was done for the marine aspect of the Couples site using 5m<sup>2</sup> quadrats to record substrate type and percentage cover and also a photo-inventory. The Sea Splash Resort site used a combination of literature review, dives and snorkel survey methods along with a photo-inventory. There were 7 species of fish and 2 seagrass species recorded. No marine component was observed for the Negril Harbour Hotel project. The Commercial Complex site recorded 32 plant species of which 2 were endemic, using a species list and ranking of data compiled from 3m by 3m quadrats near footpaths. There were also 13 bird species found on site of which 5 were endemic species (see table 9).

**Table 9: State of rare, threatened, endangered and endemic species**

Reports	Number of plant species	Number of animal species	Status of species (rare, threatened, endemic or endemic)
<i>Pre-Guideline Period (1991-1996)</i>			
Real Negril Hotel	51 flowering plants (23 tree species)	10 bird species, 4 butterfly species, 2 corals	6 endemic plants 5 endemic birds
Proposed Vendors Arcade	26	<i>Not reported</i>	<i>Not reported</i>
Couples Negril Hotel	45	36 Bird spp., 9 butterfly spp.	5 endemic, 1 rare plants 9 birds rare (1 nationally, 8 rare at site) 2 rare butterfly species
Commercial Complex, Negril	32	13 birds,	2 endemic plants 5 endemic birds
Sea Splash Plantation Resort	8	7 fish species, 6 shrimp species, 3 amphibians species	<i>Not reported</i>
Negril Harbor Hotel	<i>Not reported</i>	24 Birds (20 identified)	1 endangered, 6 endemic birds
<i>Post-Guidelines Period (1997-present)</i>			
RIU Tropical Bay Hotel	69	74 Bird, 37 fish, 23 corals (13 stony, 10 sponges), 5 amphibians, 6 reptiles, 2 crabs, 3 butterflies	6 endemic, 4 rare plants 13 endemic, 1 rare birds 1 endangered stony coral 4 endemic amphibians 4 endemic reptiles
RIU Bloody Bay Hotel	64	18 Birds (74 individuals), 3 crabs, 2 amphibians, 24 fish, 10 corals (5 stony)	3 endemic, 2 rare plants 7 endemic birds

*Descriptive and/or quantified statistics regarding environmental impacts*

The marine component was superficially documented for all reports. No attempt was made to comprehensively quantify the state of commercial fishing, reef systems and the natural vegetation of the area in the projects in this category. No report recorded species diversity using a species diversity index to describe the habitat and communities of the terrestrial and marine areas (see table 10).

The Real Negril Hotel report had information on species and populations. There were recorded data for corals on reef systems but none for fisheries. No food web or species diversity indices were used to quantify or describe the habitats and communities in either terrestrial or marine environment. In the area of environmental pollution data was recorded only for land and water pollution. In the case of potential water pollution, vague mention was made of biological oxygen demand (BOD), nitrates, phosphates, and fecal coli form. The number of water sampling sites was not indicated. Soil erosion potential was considered minimal for the site and solid waste management issues were discussed. The aesthetic parameters discussed only referred to the variety of and within the terrestrial environment to be retained on site as well as accompanying animal species, particularly birds.

The Proposed Vendors Arcade report recorded no information on reef systems and animal species. No food web or species diversity indices were used to describe habitats and communities because the site was cleared prior to any ecological assessment. Only one water pollution parameter was attempted, total suspended solids (TSS), which were evaluated quantitatively. Land and air pollution parameters evaluated were

particulate matter, solid waste and soil erosion, none quantitatively. The aesthetic parameters evaluated included: road width and alignment, ambient odor and visual characteristics.

The Couples Negril Hotel report had information on species and populations. There was little information recorded about reef systems and fisheries. No food web or species diversity indices were used to quantify or describe the habitats and communities in either terrestrial or marine environment. In the area of environmental pollution data was recorded for air, land and water pollution. The same was true for the Sea Splash Plantation Resort and Negril Harbour Hotel reports. These three reports were somewhat better than the previous two reports in describing or quantifying the environmental impacts in most areas. In the case of potential water pollution, the Negril Harbour Hotel had only 2 sample sites covering the following parameters: pH, alkalinity, BOD, TSS, salinity, nitrates, phosphates ( $PO_4$ ), total coliform, and fecal coliform.

The Couples Negril Hotel report documented dissolved oxygen (DO), fecal coliform, inorganic C & N,  $PO_4$ , and pH. The Sea Splash Plantation Resort had similar parameters as the Couples report with turbidity and temperature instead of DO. The number of water sampling sites for the Couples report was four and none mentioned for the Sea Splash Plantation Resort. Land and air pollution parameters evaluated were particulate matter, solid waste and soil erosion, none quantitatively at the three sites. Soil erosion potential and noise were considered minimal for all three sites, and solid waste management issues were discussed in all three. The aesthetic parameters discussed referred to the variety of and within the terrestrial environment to be retained on site as



well as accompanying animal species, particularly birds. The appearance of surface water, land-water interface, odor and floating material was not addressed in any of the reports.

The Commercial Complex report recorded no information on reef systems and fisheries because of its location in the town center away from the beach. No food web or species diversity indices were used to describe the terrestrial habitats and communities. Due to the location of the project site no water pollution parameter was attempted, despite the drainage channels along the road verges. Land and air pollution parameters evaluated were particulate matter mainly from vehicular emissions, solid waste and soil erosion, none quantitatively. The aesthetic parameter evaluated was the biotic characteristics.

**Table 10:** Descriptive and/or quantified statistics regarding environmental impacts of Pre-Guideline Period reports (1991-1996)

Reports	Ecology (terrestrial, marine/aquatic)	Environmental pollution parameters evaluated (water, air, land and noise)	Aesthetics parameters (land, air, water and biota)
Real Negril Hotel	Terrestrial and marine species quantified, no distinction between systems, no species diversity index	Water: BOD, NO <sub>3</sub> , PO <sub>4</sub> , fecal coliform Land: soil erosion potential	Land, air, water: none recorded Biota: animals, variety within vegetation types
Proposed Vendors Arcade	Terrestrial species quantified, no distinction between systems, no species diversity index	Water: TSS Land & noise: land use	Land: width of road Air: visual
Couples Negril Hotel	Terrestrial and marine species quantified, no diversity indices recorded	Water: DO, fecal coliform, inorganic C & N, PO <sub>4</sub> , pH Air: particulate matter Land & noise: land use, noise	Land: native vegetation Biota: animals, variety and diversity within vegetation types
Commercial Complex, Negril	Terrestrial species quantified, no diversity indices recorded	Air: particulate matter Land & noise: slope and erosion potential	Biota: variety and diversity within vegetation types
Sea Splash Plantation Resort	Terrestrial and aquatic species quantified, no diversity indices recorded	Water: fecal coliform, inorganic C & N, PO <sub>4</sub> , turbidity, temp Air: NOx, SOx, dust Land & noise: land use & erosion potential	Land, air, water: width of road, geology, sounds Biota: variety within vegetation types
Negril Harbor Hotel	Terrestrial species quantified (birds only), no diversity indices recorded	Water: fecal coliform, BOD, NO <sub>3</sub> PO <sub>4</sub> , turbidity, temp, pH, hydrocarbons Air: NOx, SOx, dust Land & noise: land use, noise	Land, air, water: none recorded Biota: animals, variety within vegetation types

*Questions regarding description of methods used in ecological assessments*

The Real Negril Hotel report documented survey methods for the terrestrial and marine environment. Transects and relative abundance/DAFOR ranking were used for the terrestrial environment, and underwater photography used for the marine environment. The number of transects done and the sampling times were not recorded. No record was found for survey seasons. No comparison of the relative importance of impacts through weighting, standardizing or aggregating was recorded. Impact prediction forecasting methods were not described; neither were worst case predictions made. Impact predictions were not quantitatively recorded. Environmentally sensitive areas were outlined on maps including the Negril Morass, and sources of information used in the report such as field guides identified.

The Proposed Vendors Arcade report had no description of the methods used to evaluate the terrestrial environment aside from site photography, because the area was cleared prior to any ecological assessment. No marine assessment was undertaken. Similar to the Real Negril Hotel report, no comparison of the relative importance of impacts through weighting, standardizing or aggregating was recorded. Impact prediction forecasting methods were not described; neither were worst case predictions made. Impact predictions were not quantitatively recorded. However, environmentally sensitive areas were outlined on maps.

The Couples Negril Hotel report documented survey methods for the both the terrestrial and marine environment. Transects ( $4m^2$ ), dbh of trees, and relative abundance/DAFOR ranking were used for the plant community, point counts from

sight/call for avifauna, ad hoc sightings of other fauna, and a snorkel survey using 5m<sup>2</sup> quadrats and photo-inventory for the marine environment for substrate type and percent cover. Surveys were not recorded for both rainy and dry seasons. No comparison of the relative importance of impacts through weighting, standardizing or aggregating was recorded. Impact prediction forecasting methods were not described; neither were worst case predictions made. Impact predictions were quantitatively recorded for water needed and holding capacity, sewage and solid waste. Environmentally sensitive areas were outlined on maps including the Negril Morass, and sources of information used in the report such as field guides identified.

The Sea Splash Plantation Resort report used a combination of literature review, dives and snorkel survey methods along with a photo-inventory to evaluate the terrestrial environment aside from site photography. Similarly, no comparisons of the relative importance of impacts through weighting, standardizing or aggregating were recorded in the reports for the Real Negril Hotel and the Commercial Complex. Neither was there a description of impact prediction forecasting methods nor worst case predictions made. Impact predictions were not quantitatively recorded. However, environmentally sensitive areas were outlined on maps. The Negril Harbour Hotel report documented a walk-through tree survey; no transects were taken. Trees were recorded using diameter at breast height (dbh). No reference page was found in the Negril Harbour Hotel report. There was no physical marine assessment, only information gathered from reference material. The Commercial Complex report used a species list and ranking methods from

data compiled from 3m<sup>2</sup> quadrats near footpaths. All reports outlined sensitive areas within proximity of sites.

*Descriptive statistics of the likely significant effects of the project*

The Real Negril Hotel report used appropriate methods where surveys were undertaken, even though they were inadequately explained. The report showed no potential hazardous construction impacts. Areas of potential point and non-point pollution were identified but not the extent of possible pollution. Emphasis was given to the most adverse effects of the project. The report failed to quantify the primary and secondary effects on aspects of the environment such as flora and fauna, hydrology, air quality, and water quality. Only water needed, solid waste and sewage were quantified. There were no suspected contaminants of concern recorded at the Real Negril Hotel site. The same could be said of the other five reports during this period. Cumulative effects were recorded for water, coral reefs, waste management, housing and transportation in one case, the Real Negril Hotel. Cumulative impacts were not identified or quantified from existing developments surrounding the site of all the other respective reports documented. Habitat dynamics was recorded in the Real Negril Hotel and the Couples Negril Hotel reports. Movement of soil was considered at four of the six sites but was considered to be minimal due to the relative flat nature of the area.

## Ecological Assessments in EISs: Post-Guidelines Period (1997-present)

### *Descriptive statistics in projects*

The two reports conducted during this period, RIU Tropical and Bloody Bay Resorts, were at least 100 rooms larger than previous hotels in the area with significantly larger building footprints where documented. Maps detailing the geographic extent of both sites were well represented. The size of the site and building footprints were adequately documented in each case. The setting of the project sites were also adequately documented including the existing and future land uses of adjacent lots. Both project sites were coastal shrub forest, and both had signs of illegal sand mining, coal burning and tree felling recorded. The size of the study teams as well as their respective qualifications was also documented (table 7).

### *The state of rare, threatened, endangered, and endemic species.*

The two reports for this period were more comprehensive in describing and quantifying the state of species on site than those of previous periods (table 9). There were 69 plants species documented for the RIU Tropical Bay Resort Hotel site of which 4 were rare and 6 endemic, while 64 plants species were identified for RIU Bloody Bay of which 3 were endemic and 2 rare. Plants were sampled using 10m<sup>2</sup> quadrats larger than used in previous reports, DAFOR ranking, and dbh of 18cm or greater for largest trees and belt transects. These two reports were the only two to specify the dbh used. Beach trails and access routes through the Tropical Bay Resort site were used to lay transects; 22 sample points were documented. Five ecological zones were also documented: beach,

coastal woodland, wetland, road verges, and swamp forest. The rare specimens on the Tropical Bay site were: an orchid, bromeliad, vine and a small tree, those on the Bloody Bay sites were an orchid and a small tree. Unlike the other six previous reports, keystone species were identified in both RIU reports for their nesting, food and breeding ground capabilities. The terrestrial fauna of the Tropical Bay site included 74 bird species of which 21 are endemic with no rarities while the Bloody Bay Resort site had a total of 18 bird species with about 7 endemics. Four pest species and 2 alien species were identified at the Tropical Bay site.

The marine environment was better documented than the reports completed prior to 1997. There were 23 corals (13 stony corals), 3 algae, 37 fish, and 10 sponge species found for the Tropical Bay Resort site. There were 10 corals (5 stony corals) and 24 fish species found for the Bloody Bay Resort site. This site also documented other marine species found: echinoderms such as sea urchins (2 species), calcareous algae, among other marine fauna. Both sites found no evidence of sea turtle nesting on the beach, but they both made note of the fact that there had been sightings in the past near each site. The extent of seagrass communities were also documented for both projects. Seagrass species such as manatee grass, *Syringodium filiform*, and *Halodule wrightii* interspersed between coral heads were documented in both report.

#### *Descriptive and/or quantified statistics regarding environmental impacts*

The RIU Tropical Bay report documented information on species and populations (see table 11). There were recorded data for terrestrial communities, corals on reef

systems and for fisheries. However, no food web or species diversity indices were used to quantify or describe the habitats and communities in either terrestrial or marine environment. In the area of environmental pollution, data was recorded for more parameters than in any of the previous six reports. In the case of potential water pollution, the following parameters were recorded: BOD, dissolved oxygen, fecal coliform, nitrates, phosphates, pH, salinity, temperature, and total dissolved solids. There were 23 sampling stations identified and 9 sampling points with respective sampling dates. No assessment of air pollution was recorded. The report attributed this to the lack of air quality monitoring data for the area and the fact that no significant industry is located near the town of Negril. Air quality in the area was documented as being below WHO and NRCA health and ambient levels, which were not stated. Land pollution was evaluated on the basis of solid waste management through available dump sites and their capacity. Soil erosion potential was considered low. The aesthetic parameters discussed referred to the geology of the site and area, visual and odor characteristics, surface water run-off, and the variety of and diversity within the terrestrial environment retained on site.

The RIU Bloody Bay report documented information on species and populations. There were recorded data for terrestrial communities, corals on reef systems and for fisheries. However, no food web or species diversity indices were used to quantify or describe the habitats and communities in either terrestrial or marine environment. Potential water pollution was described and quantified for 12 water quality parameters: BOD, dissolved oxygen, fecal and total coliform, nitrates, phosphates, pH, total dissolved



solids, salinity, temperature, photosynthetically active radiation (PAR), and chlorophyll a. There were 7 sampling stations identified with respective sampling dates. Nutrient levels recorded were found to be higher than ambient marine water quality standards, with nitrates elevated at all stations except one and phosphates at elevated at three. No assessment of air pollution was recorded. Land pollution described and quantified for noise, sewage and solid waste (available dump sites and their capacity). Soil erosion potential was considered low. The aesthetic parameters discussed referred to the geology of the site and area, visual and odor characteristics, surface water run-off, and the variety of and diversity within the terrestrial environment retained on site.

Table 11: Descriptive and/or quantified statistics regarding environmental impacts in post-guidelines reports

<b>Reports</b>	<b>Ecology (terrestrial, marine/aquatic)</b>	<b>Environmental pollution parameters evaluated (water, air, land, and noise)</b>	<b>Aesthetics parameters (land, air, water, and biota)</b>
RIU Tropical Bay Hotel (1999)	Terrestrial and marine/aquatic species identified and quantified, no diversity indices recorded	Water: BOD, DO, fecal coliform, inorganic C & NO <sub>3</sub> , PO <sub>4</sub> , turbidity, temp, pH, salinity, TDS Air: NO <sub>x</sub> , SO <sub>x</sub> , dust Land & noise: land use & erosion potential	Land, air, water: width of road, geology, sounds Biota: diversity of and variety within vegetation types
RIU Bloody Bay Hotel (2001)	Terrestrial and marine/aquatic species identified and quantified, no diversity indices recorded, pest species identified	Water: fecal and total coliform, BOD, NO <sub>3</sub> , PO <sub>4</sub> , turbidity, temp, salinity, pH, TDS, PAR, Chl. a Air: NO <sub>x</sub> , SO <sub>x</sub> , dust Land & noise: land use, noise	Land, air, water: width of road, geology, sounds Biota: diversity of and variety within vegetation types

*Questions regarding description of methods used in ecological assessments*

The RIU Tropical Bay Resort report documented survey methods for both terrestrial and marine environment. Beach trails and paths were documented as transect and access routes. Stratified sample of the area was conducted at 100 paces apart using 22 sample points covering 5 ecological zones. 10m<sup>2</sup> quadrats, DAFOR ranking scale, dbh of largest tree (18cm and over) and tree height were recorded for the plant communities. Birds were recorded using point count by sight and sound within a fixed radius of 30m, maximized by 5min periods during the early morning and late evening hours for 3 hours. Reptiles, amphibians and other fauna were recorded as they were seen. 8 transects were used to assess the marine environment along with 2 towed snorkel divers. Additionally, glass bottom boat surveys as well as spot checks with scuba dives were used to record percent cover of coral substrate and relative abundance. Photo-inventory and literature review was recorded for both terrestrial and marine environment. No record was found for survey seasons. Weighting and aggregating of impact methods were used for comparison of the relative importance of impacts. Impact prediction forecasting methods were not adequately described; neither were worst case predictions made. Impact predictions were not quantitatively recorded. Environmentally sensitive areas were outlined on maps including the Negril Morass, and sources of information used in the report such as field guides identified.

The RIU Bloody Bay Resort report documented survey methods for both terrestrial and marine environment. Permeability of sand, and groundwater table were analyzed at the site through the taking of bore-holes. The methods used for the terrestrial

flora were: preliminary walk-through survey, 30m belt transect along footpaths with the aid of 4m<sup>2</sup> quadrats, 60x10m belt transect, the flagging of dbh of largest tree (18cm and over) and tree height from the beach towards the road. The avifauna was evaluated through bird counts taken on four consecutive days, for 3 hours in the early morning and 1 hour late evening. A 100m radius was used that included habitats representing all major terrestrial areas on site. Reptiles, amphibians and other fauna were recorded as they were seen. Beach surveys were also conducted in the early morning for signs of sea turtle tracks. The marine environment was surveyed using exploratory scuba dives, snorkeling, roving diver transects and boat patrolling. The seagrass beds were snorkeled and photographed over a two-day period. Existing literature and aerial photography was also used to verify boat patrol data and used to conduct oceanographic/storm surge modeling bathymetry survey. No record was found for survey seasons. Weighting and aggregating of impact methods were used for comparison of the relative importance of impacts. Impact prediction forecasting methods were not adequately described; neither were worst case predictions made. Impact predictions were not adequately quantified. Environmentally sensitive areas were outlined on maps including the Negril Morass, and sources of information used in the report such as field guides identified.

*Descriptive statistics of the likely significant effects of the project*

Both the RIU Tropical Bay and Bloody Bay Resort reports used appropriate methods where surveys were undertaken. The report showed no potential hazardous construction impacts. Areas of potential point and non-point pollution were identified

and the extent of possible pollution. Emphasis was given to the most adverse effects of each project. The reports failed to adequately quantify the primary and secondary effects on aspects of the environment such as flora and fauna, hydrology, air quality, and water quality. It should be noted here that these were the only two reports that attempted this quantification exercise. Water needs, solid waste and sewage were adequately quantified. There were no suspected contaminants of concern recorded in either report. Cumulative effects were recorded for water, coral reefs, waste management (sewage and solid waste), housing, and transportation in both reports. Habitat dynamics was recorded in both reports. The movement of soil was not considered a major impact in either report due to the relative flat nature of the area.

#### Summary of trends

Document quality prior to Jamaica's 1997 guidelines is lower than the quality post 1997 guidelines. Four documents received an overall score of C while four scored D. However, in reports conducted post 1997 guidelines, the quality across the four review areas were better than for documents pre 1997 guidelines. This may be due to experience on the part of both NEPA and consultants. There is more time spent in the field with post 1997 reports regarding ecological assessments. Reports during this period involved new technologies and methods. Also, repetition of exercises was evident with sampling done over a longer period than pre 1997 reports. Despite this, the reports were weak with regards to quantification of impacts, weighting, and importance of impacts forecasted. Overall, document quality improved over time.

## Public participation and document quality

H2. EIA quality is higher in documents with more public participation.

Four documents received an overall grade of C and the other four D. Public participation appears to have affected document quality (see table 12). In reports where public participation was documented the overall grade was a C. Reports lacking information on public participation had an overall grade of D. Interestingly, all C graded reports were considered controversial in nature. Public meetings were held for these projects to present the results of the environmental assessment conducted. The Real Negril Hotel report documented public comments published in the printed press. These comments were about the availability of water in the area. There were also issues regarding the Negril Sewage System which was not yet completed at the time of the study. The Couples Negril Hotel had some public participation, however, very little was documented.

RIU Tropical Bay Resort had significantly more public participation than other reports with the exception of RIU Bloody Bay which had more. The major issues of concern were beach access for Jamaican citizens, the Negril Marine Park, solid waste management and sewage treatment. Public hearing on the findings of the EIA was held and documented. There were at least 25 people in attendance, with representative from NGOs, government agencies, residents of the community, and business interests. Most in attendance highlighted the lack of access to the EIR prior to the meeting. The RIU Bloody Bay Resort had the most public participation information documented. The

major issues of concern were beach access for Jamaican citizens, the Negril Marine Park, mangrove and seagrass communities, solid waste management and sewage treatment. There was more NGO participation recorded for this report during the entire environmental assessment. A public meeting was held on the findings of the EIA and documented. The number of persons in attendance was not documented, but those in attendance represented NGOs, government agencies, residents of the community and business interests. The meeting highlighted other areas of concern with the report such as; minimal community involvement, and the location and size of the fish sanctuary (seagrass and mangrove communities).

The four reports with overall grades of D had little or no documentation of public participation. They were not considered controversial and as such were not subjected to a public meeting of the study findings.

#### Summary of trends

EIA quality is higher in documents with more public participation. This is due in part to the discretionary status given to projects by NEPA. There is no mandatory public hearing of the findings of an environmental assessment. As a result, the public do not feel inclined to comment, perceiving the project as being approved. Of the eight projects, only four were deemed controversial. The same four had public meetings of the findings. Also, they all scored a C. The four projects that were not considered controversial had no public meeting, and all received a score of D.

**Table 12: Public participation and document quality**

Public Participation/ (Some/None)	Overall Quality	Review Areas				Project
		1	2	3	4	
No info	<b>D</b>	D	D	E	D	Proposed Vendors Arcade
No info	<b>D</b>	D	D	D	C	Commercial Complex, Negril
No info	<b>D</b>	C	D	E	B	Sea Splash Plantation Resort
No info	<b>D</b>	D	E	E	C	Negril Harbor Hotel
Some	<b>C</b>	B	C	D	C	Real Negril Hotel
Some	<b>C</b>	B	B	E	B	Couples Negril Hotel
Some	<b>C</b>	B	C	C	C	RIU Tropical Bay Hotel
Some	<b>C</b>	B	C	C	B	RIU Bloody Bay Hotel

#### *Research area 4: Professional opinion*

Twelve (12) EIA professionals in Jamaica were interviewed regarding their opinion of the critical problems in Jamaica's EIA system. They represented government agencies, NGOs, academia, and private consultants. An open-ended questionnaire was used to allow interviewees to be comfortable in answering and providing additional comments (see Appendix I for raw data generated). Four areas were addressed:

- i. Legislation
- ii. Implementation
- iii. Effectiveness in identifying impacts
- iv. Effectiveness in reducing impacts

#### **EIA Legislation**

The problem associated with the Jamaican EIA process that was not adequately addressed through legislation was largely centered on a belief the law was inadequate. The participants identified the following aspects as being inadequate legislatively; the content of an EIA, penalties such as fines, the EIA review body, and public participation. Eight (8) respondents suggested penalties were inappropriate, and the EIA process was not adequately tied to the existing legislation. Legislation doesn't adequately enforce or penalize breaches and EIA content is not stipulated by law but rather is a recommended guideline. Six respondents suggested public participation was inadequately tied to legislation. The other areas mentioned were poor implementation of the EIA process and



system monitoring. One person recommended laws be reviewed periodically to allow for strengthening of weakness especially as it applies to the judiciary and appeals process, and further strengthening through legislative amendments. At least one respondent reported there was no problem with the existing legislative framework.

### EIA System Implementation

Logistics and infrastructure were considered inadequate to support EIA management by 10 respondents. Qualified personnel, scientific equipment, baseline data, regulatory compliance, and education were considered as the factors at fault. Seven respondents considered personnel to be minimal to conduct regulatory compliance of all on-going projects. The same number respondents considered regulatory compliance in effect to be weak. The baseline data for the island is considered to be poor in most areas of the country because research (past and present) are continuously being done in the same areas of the country. Hence, the documents submitted are weak in data. Four reports considered the education levels of personnel conducting EIA to be weak in professional training.

The main problem reducing public participation in EIA is considered to be education. All respondents suggested education was the limiting factor. Three individuals added available financial resources as the underlying factor limiting educational programs. The general public was considered by 6 respondents to be ignorant to the facts surrounding most projects, and are only informed of their role when it is too late – usually after a draft document has been submitted and a public

hearing/meeting arranged. Eight respondents described the public as being largely ignorant of the EIA process and their role in the process. It should be noted that most projects are never subjected to public inquiry.

Local capacity for training in EIA in Jamaica can be increased through certification and training programs in EIA, and increased consultations with other countries and agencies interested in the EIA process. Eleven respondents suggested some education programs were needed. Seven suggested certification courses through local universities, while four suggested educational degree programs. One respondent suggested local capacity for government agencies was sufficient. The reason given was government agencies do send personnel to obtain higher degrees or training in the respective discipline. However, the same respondent suggested these agencies conduct short programs to inform or certify environmental NGOs and other community groups.

#### Effectiveness in identifying impacts

Ten respondents identified loss of biodiversity as the major problem of approved projects. They cited the poor identification of habitat communities and species population as well as lack of baseline data available in most cases. The removal of vegetation is considered as having long-term negative impacts. Solid waste and sewage management was considered by nine respondents as being ineffectively identified. Three respondents highlighted that trade effluent standards were not being followed. Two respondents suggested increased regulatory compliance through monitoring of the EIA process needs would improve effectiveness. Three respondents urged greater attention to

water run-off issues and site erosion potential. At least one respondent was not certain any problems existed.

In addressing effectiveness in identifying impacts in ecological assessments, five areas were addressed; impact prediction, survey methodology, cumulative impact assessments, quantitative methodology, and mitigation measures. Five respondents suggested the use of qualified multidisciplinary team to conduct assessment. Eight respondents suggested more data was needed. Hence, more time should be spent in the field to acquire data to ensure completeness. At least one of that eight identified the need to conduct research during both rainy and dry seasons. Six respondents recommended the use of impact forecasting methods that incorporates weighting of impacts and the use of new techniques such as geographic information systems (GIS).

In addressing the survey methods, nine respondents recommended the use of up-to-date methods. Three of the nine respondents recommended using only qualified specialist to survey various aspects of the assessment. Five respondents suggested consultants doing assessment acquire modern equipments. Two respondents were not sure how to address this area. Cumulative impact assessment was not considered by seven of the respondents. Of the other five that responded to this issue, four considered cumulative impact assessment to be non-existent in reports to date, and one suggested uncertainty in impact forecasting be improved or implemented.

Quantitative methods were not considered by five respondents as being a problem. Three respondents recommended the use of appropriate methods that will

quantify impacts. Two recommended the using only feasible methods per site. Four respondents identified the need to spend more time and money in the field.

Recommendations for mitigation measures included the identification of feasible measures and the responsible party for monitoring the implementation of these measures. Nine respondents suggested the identification of feasible mitigation measures as the most appropriate way to improve effectiveness. Four of the nine identified the identification of the responsible monitoring party and to whom they report as being critical to its effectiveness. Three respondents suggested mitigation measures currently being used were adequate in Jamaica.

#### Effectiveness in reducing impacts

In reducing impacts to the environment two areas were addressed; ensuring mitigation measures, and improving monitoring and enforcement. All twelve respondents identified the need to increase the personnel available for carrying out compliance monitoring. Seven respondents suggested the implementation of stiffer penalties for breaches of agreed on mitigation measures. Two of which suggested NEPA finally institute the polluter pays principle. Four respondents recommended mitigation, monitoring and enforcement measures be legally binding, and enforceable in a court of law. Two respondents recommended NEPA use only qualified personnel to conduct monitoring protocols to avoid poor monitoring effort, and guard against unnecessary repetition. One respondent urged NEPA to develop a research facility separate from the

University of the West Indies, to which most data are sent for evaluation. Financial resources were considered by four respondents to be hurting monitoring efforts.

## DISCUSSION

### The Jamaican EIA System

This study concludes that the Jamaican EIA system is comparable with the Hawaiian system in most areas evaluated according to the systemic and foundation measure evaluation criteria. The legal framework of the Jamaican system only partially meets the criteria because, compared to Hawaii, there is no distinct EIA law. The legal or procedural specification of time limits in Jamaica is partially met. Whereas all time limits are specified in the existing legislation in Hawaii; in Jamaica these are only facilitated at the administrative level. Both Hawaii and Jamaica have provisions for appeal after a decision has been given on a submitted EIS. However, in Jamaica development projects are considered approved before the project is even evaluated. The EISs reviewed that were rejected initially were later approved by the Minister for Environment. There is currently no alternative to appeal in a court of law.

Administratively, Jamaica compared very well with Hawaii. The only area seen as being significantly weaker is the level of coordination mechanisms for EIA implementation with other agencies. NEPA conducts occasional meetings and informal liaison with other agencies in Jamaica on an ad hoc basis. There are two state agencies in Hawaii to regulate the EIA process; in Jamaica there is only one. This is in itself not a problem bearing in mind the size and financial constraints of the country. Since 1999 project proponents have used a Project Information Form (PIF) to screen projects in Jamaica, to determine the necessity of an EIA. While this is a big improvement from

what was being done prior to the published guidelines and regulations of 1997, there are still many weaknesses in the Jamaican EIA process. The most serious problems involve adequate biotic assessment, identification of alternatives and mitigation measures, and involvement of the public in the EIA process. NEPA uses a 10 day turn around period; however, in some cases it takes much longer as observed by Somers (1999).

Procedurally, Jamaica partially meets 5 of the 11 procedural criteria when compared with Hawaii. More reform of EIAs in Jamaica is needed to bring Jamaica in line with internationally accepted standards for screening, which will minimize the sharp distinction of which projects require an EIA and which do not. This should be legally binding as is the case in Hawaii. A matrix for scoping relevant issues in the EIA is yet to be seen as fully incorporated in the EIA document process, as suggested by Somers (1999). In this case, Jamaica could benefit from creating a list of threshold standards similar to those used in Hawaii.

The public should be fully incorporated during the process of drafting the EIS in Jamaica. The two areas where they are currently allowed are not enough. The review and decision-making process within the Jamaican EIA system needs to be more transparent. While mitigation measures were being introduced only in a theoretical manner prior to the 1997 regulations and guidelines, there is now a requirement for mitigation and environmental management plans (EMPs) in project EIAs. However like most amendments to the EIA process it is not yet legally-binding. Mitigations and EMPs should ideally itemize logistical and institutional arrangements for the implementation of mitigation measures, another measure called for by Somers report. However, in

documents reviewed where something similar to an EMP was included, there was no mention of who does the monitoring, the budget needed to undertake such monitoring and what training will be required and by whom, where there is need for such training. As such, there is not much weight on compliance with measures. Authorities have found it hard to implement EMPs because of lack of funding and motivation. However the implementation of EMPs as guidelines for local authorities may help to reduce the discouraging trend (Glasson et al. 1999). NEPA has the legal responsibility to do follow up on monitoring efforts but is constrained by time, personnel and resources.

#### Public Participation in the Jamaican EIA process

Provisions for public participation in Jamaica have been described by many as being weak and occurring only after the conclusion of the EIA process (McDonald 1997; Smith 1999). This has been seen in the reviewed projects, in most cases public participation occurred after the EIA has been submitted and is being reviewed. Although guidelines have been developed for conducting EIAs and for public presentation, there is still no legal requirement in place ensuring public participation during the EIA process. Legally-binding regulations are needed to provide some strength to the EIA process and the requirements for public presentation, as recommended by professionals interviewed. This is supported in the literature in other countries (UNEP 1992; Dresner and Gilbert 1999).

Although there is a weak provision for public participation in Jamaican EIA system, there is a move on the part of the Government to allow the public right to



information to be recognized. This was brought about in 2002 with the passing of the Access to Information Act (Act 21/2002). The objective of this Act is to provide governmental accountability, transparency and public participation in national decision-making process. Despite the fact that public participation is an integral role in the EIA system little evidence was seen in the reports reviewed. The right of the public is still being perceived to be decided by a small intellectual group without actual consultation with the laymen.

It has been recommended that an amendment be made to the Jamaican EIA process requiring two mandatory public notices for projects subjected to an EIA (Somers 1999). This in an effort to allow the public an opportunity to express their concerns about proposed projects. The first recommended notice should take effect after the terms of references have been drafted and the second notice coinciding with the review period for the draft EIA.

#### Public participation and EIA document quality in Jamaica

There have been less than 400 EISs approved in Jamaica since 1991. McDonald (1997) reviewed 30 Jamaican EIA reports and found only 7 received an average grade of C using a similar rating scale to that used in this study. Reeson (2000) reviewed 13 documents of which two were reviewed in this study and gave 12 a rating of bad and one a rating of fair on a bad-fair-good rating scale, with an overall rating similar to a D as used in this report. The main areas within documents that were poorly done includes: alternatives to projects, identifying all sources of data, data analysis, identifying the

significance of impacts remaining after mitigation measures, commitment to mitigation measures and a brief, accountable non-technical summary of data within an EIA. Most projects reviewed in this study can be considered inadequate largely because of omissions.

Overall, four of eight projects reviewed could be considered to be *just satisfactory*. The other four reports had major omissions or inadequacies. There is argument for the need to have high quality EISs from the onset of a study. This will allow developers and lead agencies to reduce costly interactions. Others suggest the entirety of the report is more crucial, and that statutory bodies, comments from the general public and the expertise of lead agency and preparers can significantly offset the limitations of a poor EIS (Glasson et al. 1999)). In Jamaica, entirety of information needs to be improved through greater participation of the general public as well as the appeals process. Reduction in costly interactions between developers, consultants and lead agency can only further improve the quality of participation and EIA quality. The findings regarding EIA quality are not unique to Jamaica. Other researchers have documented poor or just satisfactory reports in both developed and developing countries with a better history of EIA over the past decade (Lee and Colley 1991; Treweek et al. 1993; Warnken and Buckley 1998; Bojorquez-Tapia and Garcia 1998; Cooper and Sheate 2002).

NEPA needs to ensure that agreed upon screening and scoping measures outlined prior to the EIA writing process are adequately adhered. There were too many instances where agreed terms of reference were not followed or revised terms of reference were not

included, as should be the case, in the draft document. This makes it hard for the public reviewing the EIA to know what terms were agreed upon or what revisions were asked for, to test the completeness of the document. Changes made to reports as a result of public comment, whether it be layman, NGOs or otherwise, should be emphasized in final documents with inclusion of the representative comment letters.

The loss of flora and fauna is currently not adequately addressed or monitored by the current Jamaican EIA process. There is no system in place to identify critical habitats on project sites which would allow for the modification of development plans of the area. This is seen in EISs reviewed; they fail to identify the habitats and communities existing and how the loss of those communities will affect the biodiversity of the Negril area. There are two areas in the Jamaican EIA process that are considered to be eroding, EIA reports opining what impacts will be by engineers and two, the review process in place for EIA reports (JIEP 2001). Ecological zonation and hazard maps are not being used to inform EIAs (JIEP 2001).

#### Professional opinion regarding Jamaica's EIA process

What are the problems with the Jamaican EIA system as it relates to the following areas?

- i. Legislation
- ii. Implementation
- iii. Effectiveness in identifying impacts
- iv. Effectiveness in reducing impacts

Professional opinions of the major problems associated with the Jamaican EIA system are: inadequate legislation and educational programs, lack of financial resources and qualified personnel to oversee the EIA process and monitor proposed mitigation measures. Existing laws need to be amended or new laws created to make all aspects of the process legally binding. The appeals process should be revamped to make the courts the last resort and not the Minister of Environment as is currently the case. The Jamaican government needs to remove the shroud of bureaucratic red tape associated with the process by improving transparency and public participation. Penalties for breaches should be applied through a strict legal statute and dealt with immediately through legal channels to deter future breaches. These fines should fit the offence.

Long-term economic and social impacts should be associated with long-term environmental impacts. The use of weighting, standardizing and aggregating of impacts should be incorporated in assessment methods along with new technology and equipment. Funding should be sourced by NEPA to fund education programs for staff and the public, and also for capacity development of the agency.

## CONCLUSIONS

### Jamaican EIA System

Jamaican EIA laws are not legislatively similar to the Hawaiian state EIS law. Although, Jamaican EIA rules are apart of a comprehensive environmental legislation, there are still too many aspects of the process that are not legally binding. Jamaican administrative, procedural, and foundation measures are not entirely weaker than those in Hawaii. Administrative and procedural requirements in the Jamaican EIA process are not totally mandated by law. Most guidelines published are neither rule nor law, simply stated, project proponents are only recommended to follow these guidelines. Reason (2000) also specified the fact that there are no regulations specifying the structure and content of an EIA in Jamaica. Foundation measures are weak mainly due to financial constraints of the government agency, NEPA.

There is evidence of continued refinement of the process through the implementation of technical and general guidelines. Interestingly, the Jamaican government has initiated strategic environmental impact assessment (SEA), which is still in the infancy stage. The merger of three state agencies functions to form NEPA can be viewed as a step in reducing redundancy in state actions thereby improving efficiency.

A target of a 90-day turn-a-round period for review and decision-making of development applications suggested by the Minister of Environment in 1999 is considered to be very ambitious (Somers 1999). This is because it is months shorter than many other international systems such as Hawaii. Although an appeals process is a part

of the EIA process, it would be a more transparent process should the government remove final appeals from the seat of the Minister and place it in the hands of an independent judiciary body. This poses the problem of taking decision-making partially out of the government hands; relatively few countries that have adopted EIA have been willing to take this step (Leu et al. 1996).

Jamaican administrative, procedural, and foundation measures are not entirely weaker than those in Hawaii. Administratively and procedurally EIA process in Jamaica is not totally mandated by law. Most guidelines published are neither rule nor law, simply guidelines that project proponents are recommended to follow. Foundation measures are weak mainly due to financial constraints of the government agency, NEPA

#### Public participation in Jamaican EIA system

Jamaica's 1997 public participation guidelines improved actual participation in EIA practice. Although actual public participation was improved, there were not enough documents reviewed after the 1997 guidelines to make this a significant finding. Also, it may be due to the fact that both reports were considered controversial by NEPA. The weaknesses of public participation in Jamaican EIA process documented in this study were also found in the Somers report (1999).

#### EIA document quality and public participation

EIA quality is not satisfactory, but it is improved by public participation. Of the eight approved projects reviewed, half had some public participation documented. These

reports received grades of C, whereas the other four reports had little or no public participation data recorded. The four reports that were considered just satisfactory overall (grade C) were all considered controversial by NEPA. As such, public meetings were held in all four cases. The other four documents reviewed apparently had no public meeting to air the findings of the reports. There is clear evidence that EIAs are mostly unsatisfactory and should be a cause for concern, but Jamaica is not alone, this has been identified in reviews done in many developed countries (Lee and George 2000).

As an academic study, this paper promotes the continued review of EIA policy and reports conducted in Jamaica through both aggregated and disaggregated methods for the continued improvement of the system. Even though the methods used in this paper differ from those of other researchers, the results are pretty much the same. Therefore, it can be viewed as an effective tool in the quality control during any EIA process. It allows high standards to be set that dictate the content and format of EIA reports as well as providing a measure by which these standards can and should be compared over time.

## RECOMMENDATIONS

In Jamaica, the EIA process has undergone changes in structure, and in the integration of public environmental concerns into its planning structure. The following legislative, administrative, procedural, and foundation measures are recommended as possible improvements to the Jamaican EIA system. Recommendations are made as they relate to the state agency, NEPA, and EIS preparers. These recommendations build on recommendations made in other reports (Somers 1999; Reeson 2000).

### Recommendations for NEPA

**Recommendation #1:** NEPA needs to re-examine EIA criteria determination and legislation.

Mini-EIAs could be used in areas where projects had already undergone a full project EIA, unless the project is in itself a new venture with potentially significant impacts. There are projects that should be subjected to an EIA process that have sidestepped it such as hotel developments by building room limits under the threshold and adding to developments in future periods.

**Recommendation #2:** Improve objectivity in the EIA process.

This can probably be worked out through think-tank workshops utilizing the knowledge of EIA professionals in the Jamaica. Improving transparency in the review and approval stage by providing financial backing, such as charging a flat fee for each



EIA, will go a far way towards improving the review process. These changes may be in the form of institutional changes such as the formation of interagency review boards to provide independent review regardless of the proposing agency, Ministry or developer. While it is accepted that consultants are usually hired to prepare EIAs, it might be prudent to consider changing the law to expressly forbid developers or proposing agencies from preparing their own EIAs, or using firms that represent a direct conflict of interest. Or based on the small size of the professionals NEPA could become the immediate client for the consulting firm which prepares the EIA. Also initiate public education programs specifically for EIA, similarly recommended in the Reeson (2000) report. Also, keep better documentation of public comments associated with projects. This can be achieved by incorporating comments in final draft documents where the comments led to changes in the draft document.

**Recommendation #3:** Broaden participation/improve with all stakeholders.

Given the geographic location and size, there is tremendous trade-offs/conflict between the environment and economics which might be better served through more extensive discourse. This may include non-judicial alternatives such as mediation or other methods of dispute resolution. Broadening the participation in EIA ensures that popular knowledge and experience is tapped in the EIA process. The needs of communities can therefore be met, and builds support for project alternatives. There should be at least three mandatory public consultation periods. The public should be afforded greater opportunity to express their views and concerns about a proposed

project, as such there should be more opportunities such as before, during and after the drafting of an EIS. Regardless of the level of controversy, a public meeting should be conducted. This will add transparency to the process and allow the public to feel as if they are a part of the process. NEPA also needs to ensure there are available copies of the documents placed strategically in the project site location. At least a weeks notice prior to a public hearing should be given.

**Recommendation #4:** Invest in and request the use of modern methods and technology such as impact forecasting using weights and geographic information systems (GIS).

The EIAs granted approval and archived since 1991 provide a valuable database on impacts and mitigation strategies. These can be used to inform preparers of possible existing acceptable standards to reduce time and material.

**Recommendation #5:** Acquire more personnel (qualified) to speed up the process of reviewing documents and monitoring approved mitigation measures.

This will require extensive training of EIA professionals through avenues such as workshops. Training programs should be built around existing baseline data. It should address the needs of the country from the perspective of the most pressing environmental issues, especially as they relate to the EIA process. Short-term programs should be geared at addressing the immediate needs of professionals and environmental stewards. Long-term programs can take the form of certificate programs such as degrees to address knowledge and skill base for individuals without such qualifications.

## Recommendations for EIS preparers

### **Recommendation #1: Spend more time in the field**

EIS preparers should spend more time in the field to acquire data. Data from the reports reviewed suggested that not enough data is being acquired in the field. Terrestrial assessments are lacking in amount of sampling undertaken, parameters considered for sampling, and the ad hoc nature of surveying terrestrial fauna that are not avifauna or considered threatened. Marine assessments usually only assess chemical parameters and are usually not comprehensive. Since Jamaica has two seasons, data should be collected across both seasons. This will eliminate the cutting of corners in reports and provide an approach that will promote transparency in the process.

### **Recommendation #2: Improve objectivity in EIS during the assessment process.**

Increase dialogue with the public during the drafting on the document. This will remove the anti-development stance of the public. It will reduce the public perception that projects are “rubber stamped” by the government before they even begin.

Community information may also help in the problem solving process, regarding impacts not readily seen or not documented in a project locale.

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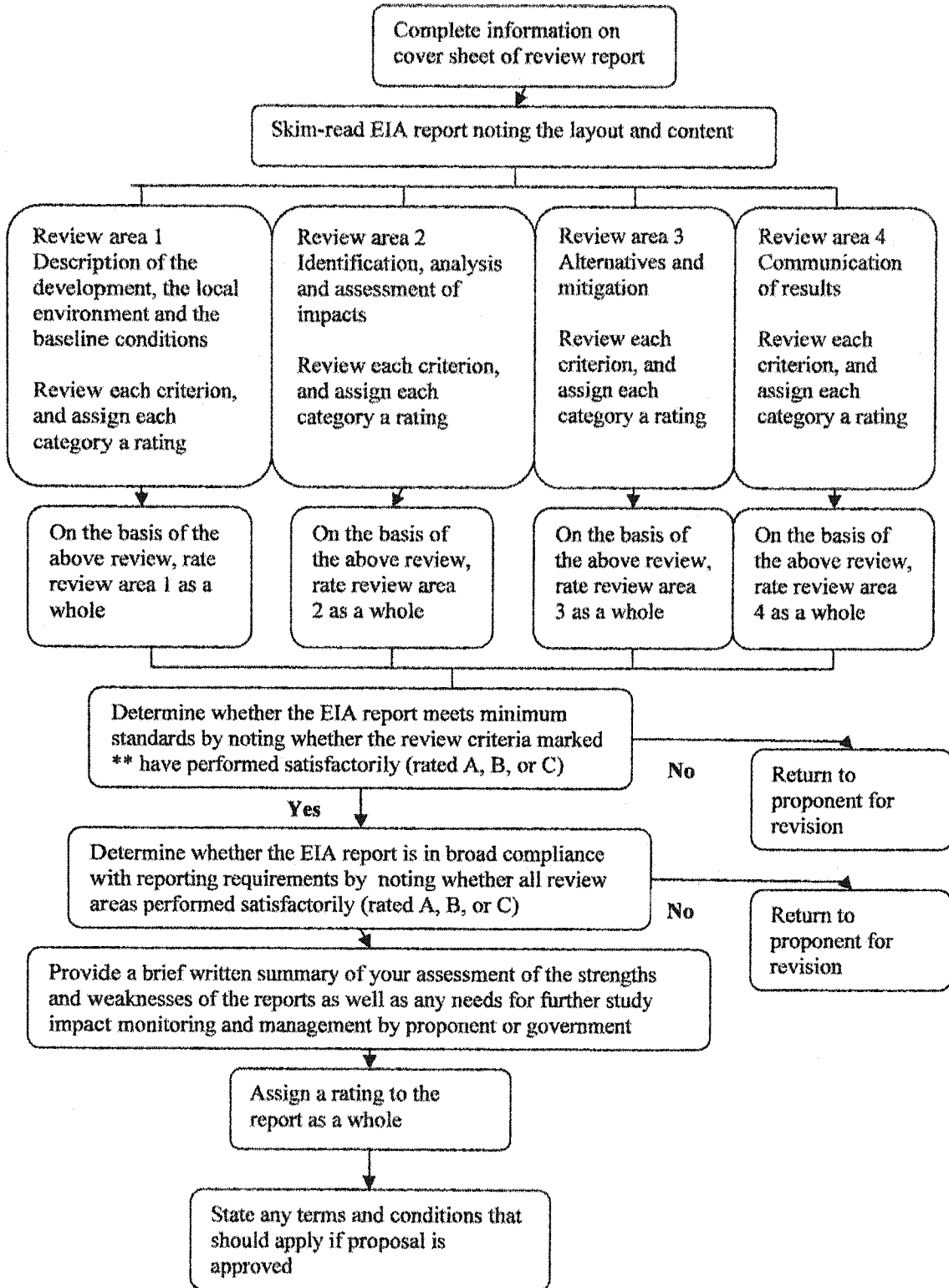
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## APPENDIX A: LEE-COLLEY REVIEW HIERARCHY



## APPENDIX B: REVIEW CRITERIA CHECKLIST

### Review Area 1

#### Description of the development, the local environment and the baseline conditions

1.1	Description of the development: the purpose(s) of the development is adequately described as well as its physical characteristics, scale and design. Quantities of material needed during construction and operation are included and, where appropriate, a description is given of the production processes.	
1.1.1	The purposes and objectives of the development are adequately explained.	rating**
1.1.2	The design, size or scale of the development, and the nature and duration of construction and operation activities, are adequately described. Diagrams, plans, charts and/or maps are used effectively for this purpose	rating**
1.1.3	The report adequately describes the environmental planning that went into the design of the project to minimise negative environmental effects and capture potential benefits.	rating**
1.1.4	Important design features, especially those for environmental planning and socio-economic management (e.g. pollution control, waste management, erosion control, handling of toxic or hazardous materials, worker services) are highlighted.	rating
1.1.5	There is an adequate indication of the physical presence or appearance of the completed development within the receiving environment.	rating
1.1.6	The nature and quantities of material need during both the construction and operational phases are described as well as, where appropriate, the nature of the production processes.	rating
1.1.7	The numbers of workers involved with the project during both construction and operation are estimated.	rating**
<b>Overall grade for category 1.1</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
1.2.	Site description: the on-site land requirements of the development are described, as well as the duration of each land use.	
1.2.1.	The land area taken up by the development site is well defined and its location clearly shown on a map.	rating**
1.2.2.	The uses to which this land will be put are described and the different land use areas demarcated.	rating
1.2.3	Where alternate plans, designs or sites are being considered each is adequately discussed according to Criteria 1.2.1 and 1.2.2	rating
<b>Overall grade for category 1.2</b>		<b>A B C D E F</b>

<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>1.3.</b>	<b>Residuals: the types and quantities of residual and/or waste matter and energy created are adequately estimated, the expected rate of production given, and the propose disposal routes to the environment identified.</b>	
1.3.1.	The types and quantities of waste matter, energy and residual materials and the rate at which these will be produced, are adequately estimated. Uncertainties are acknowledged and ranges or confidence limits given where possible.	rating**
1.3.2.	The ways in which it is proposed to handle and/or treat these wastes and residuals is indicated, together with the routes by which they will eventually be disposed of to the environment.	rating**
<b>Overall grade for category 1.3</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>1.4</b>	<b>Bounding the study: appropriate boundaries to the study area and time horizon are identified.</b>	
1.4.1	The environment expected to be affected by the development is delimited with the aid of suitable scale map(s).	rating**
1.4.2	The affected environment is defined broadly enough to include any potentially significant effects occurring away from the immediate project site(s). These may be caused by, for example, the dispersion of pollutants, off-site infrastructure requirements, traffic, etc.	rating**
1.4.3	The time horizon of the study is long enough to account for delayed effects.	rating
<b>Overall grade for category 1.4</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>1.5</b>	<b>Baseline condition: an adequate description of the affected environment as it is currently, and as it could be expected to develop if the project were not to proceed, is presented.</b>	
1.5.1	The important components of the affected environments are adequately identified and described. The methods and investigation undertaken for this purpose are disclosed and are appropriate to the size and complexity of the assessment task. An appropriate amount of fieldwork was done. Uncertainties are indicated.	rating**
1.5.2	Existing data sources were searched and, where relevant, used. These include local authority records and studies carried out by, or on behalf of, government and private sector organisations.	rating
1.5.3	Local land use and development plans were consulted and other data collected as necessary to assist in the determination of the probable future state of the environment, in	rating

	the absence of the project, taking into account natural fluctuations and human activities.	
<b>Overall grade for category 1.5</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>Overall evaluation of Review Area 1</b>		<b>A B C D E F</b>
<b>Comments</b>		

## Review Area 2

### Identification, Analysis and Assessment of Impacts

<b>2.1</b>	<b>Identification of impacts: all potentially significant impacts are identified. Key impact are also identified and the main investigation centred on these</b>	
2.1.1	All important issues identified in the EIA terms of reference are included in the report. Deviations and exclusions are adequately accounted for.	<b>rating**</b>
2.1.2	Direct and indirect impacts are identified using a systematic methodology (e.g. project-specific checklists, matrices, impact networks, expert judgement, extensive consultations). A brief description of the impact identification methods is given along with the rationale for using them.	<b>rating**</b>
2.1.3	Due attention is paid to environmentally sensitive areas, to off-site, time delayed or recurring (e.g. seasonal) impacts and to cumulative or synergistic effects with existing and anticipated developments.	<b>rating</b>
2.1.4	Consideration is not limited to effects which will occur under design operating conditions. Where appropriate, impacts which might arise from non-standard operating conditions, or due to accidents, are also included.	<b>rating</b>
2.1.5	All phases of the project are considered e.g. pre-construction, construction, operation and decommissioning.	<b>rating**</b>
2.1.6	Key impacts were identified and selected for more intense investigation. The scoping methods are described and their use justified.	<b>rating**</b>
<b>Overall grade for category 2.1</b>		<b>A B C D E F</b>
<i>Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>2.2</b>	<b>Analysis of impact severity: the likely impacts of the development on the environment are analysed and described in as precise terms as possible.</b>	
2.2.1	Impacts are analysed as the deviation from baseline conditions, i.e. the difference between	<b>rating**</b>

	environmental conditions expected if the development were not to proceed and those expected as a consequence of it.	
2.2.2	The data used to estimate the severity of impacts is sufficient for the task and clearly described. Any gaps in the required data are indicated and accounted for.	rating**
2.2.3	The methods used to predict impact severity are described and are appropriate to the size and importance of the projected disturbance. The assumptions and limitations of the methods are explicitly discussed.	rating**
2.2.4	Descriptions of impact severity encompass the appropriate characteristics of impact (e.g. magnitude, areal extent, duration, frequency, reversibility, likelihood of occurrence).	rating
2.2.5	Where possible, estimates of impacts are recorded in measurable quantities with ranges and/or confidence limits as appropriate. Qualitative descriptions, where necessary, are as fully defined as possible (e.g. 'minor' means not perceptible from more than 100m distance).	rating
<b>Overall grade for category 2.2</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>2.3</b>	<b>Assessment of impact significance: the expected significance that the projected impacts will have for society are adequately assessed. The sources of quality standards plus the rationale, assumptions and value judgements used in assessing significance are fully described.</b>	
2.3.1	The significance of all impacts which will remain after mitigation are described and clearly distinguished from impact severity.	rating**
2.3.2	The significance of impacts is assessed using appropriate national and international quality standards where available. Explicit account is taken of the values placed on affected environmental features locally, nationally and (where appropriate) internationally.	rating**
2.3.3	The choice of standards, assumptions and value systems used to assess significance are justified and the existence of opposing or contrary opinions acknowledged.	rating**
2.3.4	Wherever possible, economic values are attributed to environmental costs and benefits.	rating**
2.3.5	Individuals, groups, communities and government agencies affected by the project are clearly identified.	rating**
<b>Overall grade for category 2.3</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>Overall evaluation of Review Area 2</b>		<b>A B C D E F</b>
<b>Comments</b>		

**Review Area 3  
Alternatives and Mitigation**

3.1.	<b>Alternatives: project alternatives are considered. These are outlined, the environmental implications of each presented and the reasons for their adoption or rejection briefly discussed.</b>	
3.1.1	Alternative sites, processes, designs and operating conditions are considered where these are practicable and available to the developer. The main environmental advantages and disadvantages of these are discussed and the reasons for the final choice given.	rating**
3.1.2	Where possible, alternative construction strategies (e.g. timing, local versus imported labour) are considered and assessed for their environmental and socio-economic implications.	rating
3.1.3	For public sector proposals, alternative means of achieving project goals are considered (e.g. energy efficiency investments versus dams for energy supply). If not, the report discusses why this was not done.	rating
<b>Overall grade for category 3.1.</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
3.2.	<b>Scope and effectiveness of mitigation measures: all significant adverse impacts are considered for mitigation. Evidence is presented to show that proposed impact management measures will be appropriate and effective.</b>	
3.2.1	Concerned stakeholders (e.g. individuals, groups, communities, government agencies) have been adequately consulted and their views accounted for in the development of mitigation measures.	rating**
3.2.2	The mitigation of all significant adverse impacts is considered. Wherever possible, specific mitigation measures are defined in practical terms (e.g. costs, manpower, equipment and technology needs, timing).	rating**
3.2.3	Any residual or unmitigated impacts are discussed and justification offered as to why these impacts should not or cannot be mitigated.	rating
3.2.4	It is clear to what extent the mitigation methods will be effective. Where effectiveness is uncertain or depends on assumptions about operating procedures, climatic conditions, etc. data is introduced to justify the acceptance of these assumptions.	rating
3.2.5	An effective environmental monitoring and management plan is presented to deal with expected; possible but uncertain; and unforeseen impacts caused by the project. Training needs are identified. The costs of the programme are estimated. Developer and government responsibilities are distinguished, reporting and review procedures are specified.	rating**
<b>Overall grade for category 3.2.</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		

<b>Comments</b>	
<b>3.3</b>	<b>Commitment to mitigation: the project proponent clearly expresses a commitment to, and capability of, carrying out the mitigation measures.</b>
<b>Overall grade for category 3.3.</b> <span style="float: right;"><b>A B C D E F</b></span>	
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>	
<b>Comments</b>	
<b>Overall evaluation of Review Area 3</b> <span style="float: right;"><b>A B C D E F</b></span>	
<b>Comments</b>	

#### Review Area 4 Communication

<b>4.1</b>	<b>Public involvement: there were genuine and adequate consultations with concerned project stakeholders to inform them of the project and its implications and to obtain their views on key issues to be investigated and managed. The scope and results of the public involvement program are adequately documented in the report.</b>	
<b>Overall grade for category 4.1.</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>4.2</b>	<b>Layout: the layout of the report enables the reader to find and assimilate information easily and quickly. External data sources are acknowledged.</b>	
<b>4.2.1</b>	There is an introduction briefly describing the project, the aims of the environmental assessment and how those aims are to be achieved.	<b>rating</b>
<b>4.2.2</b>	Information is logically arranged in sections or chapters and the whereabouts of important data is indicated in a table of contents or index. Terms of reference and data used in the assessment are included in appendices. The study team members are identified.	<b>rating**</b>
<b>4.2.3</b>	When data, conclusions or quality standards from external source are introduced, the original source is acknowledged at that point in the text. A full reference is included in a footnote or in a list of references.	<b>rating</b>
<b>Overall grade for category 4.2.</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>4.3.</b>	<b>Presentation: care is taken in the presentation of information to make sure that it is accessible to</b>	



	<b>the non-specialist.</b>	
4.3.1	Information is comprehensible to the non-specialist. Tables, graphs and other graphics are used as appropriate. Unnecessarily technical or obscure language is avoided. Technical terms, acronyms and initials are defined, either when first introduced in the text or in a glossary.	<b>rating**</b>
4.3.2	The report is presented as an integrated whole. Data presented in appendices is fully discussed in the main body of the text.	<b>rating</b>
<b>Overall grade for category 4.3.</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>4.4.</b>	<b>Emphasis: information is presented without bias and receives the emphasis appropriate to its importance in the context of the project.</b>	
4.4.1	Prominence and emphasis is given to all potentially significant impacts, both adverse and beneficial, in a balanced manner.	<b>rating**</b>
4.4.2	The statement is unbiased and does not lobby for any particular point of view.	<b>rating</b>
<b>Overall grade for category 4.4.</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>4.5</b>	<b>Non-technical summary: there is an adequate non-technical summary outlining the main conclusions and how they were reached.</b>	
4.5.1	There is an adequate non-technical summary of the analysis and main findings of the study. Technical terms, lists of data and detailed explanations of scientific reasoning are avoided.	<b>rating**</b>
4.5.2	The summary is comprehensive, containing at least a brief description of the project and the environment, an account of the main impacts and mitigation measures to be undertaken by the developer, and a description of any remaining or residual impacts. A brief explanation of the methods by which information and data were obtained, and an indication of the confidence that can be placed in them, is also included.	<b>rating</b>
<b>Overall grade for category 4.5.</b>		<b>A B C D E F</b>
<i>(Note criteria marked ** must be rated A, B or C for the category to be satisfactory, if not, return report to proponent for revision)</i>		
<b>Comments</b>		
<b>Overall evaluation of Review Area 4</b>		<b>A B C D E F</b>
<b>Comments</b>		

**APPENDIX C: DRAFT ECOLOGICAL ASSESSMENT CHECKLIST**

Plan No. \_\_\_\_\_

Date approved: \_\_\_\_\_

No.	Review Criteria	Criteria adequately addressed [Y/N where applicable]	Key Information absent	Comments
<b>1.0</b>	<b>Descriptive statistics about the projects</b>			
1.1	Is this a low impact or high impact project?			
1.2	Is the geographical extent of project outlined?			
1.3	Total area (in ha.) of project site indicated?			
1.4	Total area (in ha.) of building footprint indicated?			
1.5	Present land use of the site included [Type of facility present where applicable]			
1.6	Surrounding land use stated (including any protected areas)			
1.7	Qualification of individual doing ecological assessments			
<b>2.0</b>	<b>Descriptive statistics about the state of rare, threatened, endangered and endemic species</b>			
2.1	Are any rare, threatened and/or endangered species (plant or animal) known to inhabit the area of the site? [If yes, what methods were used to identify them? - Comment]			
2.2	What is the total number of plant species on site? [If yes, what methods were used to identify them - Comment]			
2.3	Total number of animal species on site			
2.4	Total number of indicator/keystone species			

No.	Review Criteria	Criteria adequately addressed [Y/N where applicable]	Key Information absent	Comments
2.5	Total number of endemic species			
2.6	Total number of endangered species			
2.7	Total number of rare species			
2.8	Total number of threatened species			
2.9	Total number of exotic/alien species proposed for site			
2.10	Number of site visit			
2.11	Factors contributing to endangered/threatened status mentioned			
2.12	Potential factors contributing to endangered/threatened status mentioned			
<b>3.0</b>	<b>Descriptive and/or quantified statistics regarding environmental impacts<sup>1</sup></b>			
3.1.	<b>ECOLOGY - Species and populations</b> <i>Terrestrial</i> a. crops b. natural vegetation c. pest species <i>Marine/Aquatic</i> a. commercial fisheries b. natural vegetation c. reef systems			
3.2.	<b>ECOLOGY - Habitat and Communities</b> <i>Terrestrial</i> a. Food web index b. Land use c. Species diversity <i>Marine/Aquatic</i> a. Food web index b. Land use c. Species diversity			
3.3.	<b>ECOLOGY - Description of</b>			

No.	Review Criteria	Criteria adequately addressed [Y/N where applicable]	Key Information absent	Comments
	ecosystem			
3.4.	<b>ENVIRONMENTAL POLLUTION</b> <i>Water pollution</i> <ul style="list-style-type: none"> <li>a. BOD</li> <li>b. Dissolved oxygen</li> <li>c. Fecal coliforms</li> <li>d. Inorganic carbon, nitrogen and phosphorous</li> <li>e. Pesticides</li> <li>f. pH</li> <li>g. total dissolved solids</li> <li>h. toxic substances</li> <li>i. turbidity</li> <li>j. temperature</li> <li>k. salinity</li> </ul>			
3.5.	<b>ENVIRONMENTAL POLLUTION</b> <i>Air pollution</i> <ul style="list-style-type: none"> <li>a. CO</li> <li>b. Hydrocarbons</li> <li>c. NOx</li> <li>d. Particulate matter</li> <li>e. SOx</li> </ul>			
3.6.	<b>ENVIRONMENTAL POLLUTION</b> <i>Land Pollution</i> <ul style="list-style-type: none"> <li>a. land use</li> <li>b. soil erosion</li> </ul>			
3.7	Noise pollution			
3.8	<b>AESTHETICS</b> <i>Land</i> <ul style="list-style-type: none"> <li>a. geological surface material</li> <li>b. width and alignment</li> </ul>			
3.9.	<b>AESTHETICS</b> <i>Air</i> <ul style="list-style-type: none"> <li>a. odor and visual</li> </ul>			

No.	Review Criteria	Criteria adequately addressed [Y/N where applicable]	Key Information absent	Comments
	b. sounds			
3.10.	<b>AESTHETICS</b> <i>Water</i> a. appearance b. land and water interface c. odor and floating material d. wooded and geological shoreline			
3.11.	<b>AESTHETICS</b> <i>Biota</i> a. animals (domestic and wild) b. diversity of vegetation types c. variety within vegetation types			
4.	<b>Questions regarding description of methods used in ecological assessment cont.</b>			
4.1	Types of survey methods stated [Determine if qualitative or quantitative]			
4.2	Were survey done in the rainy and dry seasons?			
4.3	Do quantitative methods attempt to compare the relative importance of all impacts to produce a composite index by: a. weighting b. standardizing c. Aggregating?			
4.4	Are ecological impact predictions quantitatively measured?			
4.5	Are methods used to predict effects described and reasons for their choice discussed.			

No.	Review Criteria	Criteria adequately addressed [Y/N where applicable]	Key Information absent	Comments
4.6	Where there is uncertainty are worst case predictions described?			
4.7	Are difficulties acknowledged and their implications discussed where there are difficulties in compiling data?			
4.8	Do any potential sensitive environmental areas exist adjacent to or in proximity to the site			
4.9	General location of these sensitive areas identified [Maps etc.]			
4.10	Source(s) of information used to identify these sensitive areas [Field manual etc.]			
4.11	Was a field guide used to aid any of the identifications of biological specimens?			
4.12	Was a reference provided for the field guide?			
4.13	Were aerial or other site photographs included in the assessment?			
<b>5.</b>	<b>Descriptive statistics of the likely significant effects of the project. If applicable:</b>			
5.1	Where surveys have been undertaken, were the methods used appropriate?			
5.2	Potential hazardous construction impacts mentioned?			
5.3	Possible pollution factors (point and non point sources) identified ?			
5.4	Is appropriate emphasis given to the most severe, adverse			

No.	Review Criteria	Criteria adequately addressed [Y/N where applicable]	Key Information absent	Comments
	effects of the project?			
5.5	Any movement of soil (at the site)?			
5.6	Are direct, primary effects on the biological land use described appropriately quantified? [i.e. effects on fauna and flora and habitats]			
5.7	Are direct, primary effects on the physical land used described appropriately quantified? [i.e. effects on hydrology, water quality, air quality etc.]			
5.8	Are direct, primary effects on the depletion of non-renewable natural resources described appropriately quantified? [i.e. effects on fauna and flora and habitats]			
5.9	Are secondary effects on any of the above aspects of the environment caused by primary effects appropriately quantified?			
5.10	Are cumulative effects on the environment from the project together with existing and/or planned developments in the locality described?			
5.11	Any suspected contaminants of concern at the site?			
5.12	Were habitat dynamics identified?			

## **APPENDIX D: DRAFT STRUCTURED INTERVIEW QUESTIONNAIRE**

I am going to ask you some questions about your experience with the Jamaican EIA system. This interview will be recorded in note form only, with a number assignment to ensure anonymity. No name or any other form of identification will be recorded. If you do not wish to answer a question, I will continue with the next question. You may end the interview at any time.

### *Legislation*

1. What problems associated with the Jamaican EIA process are not being addressed by the existing legislative framework?

### *Implementation*

1. Are logistics and infrastructure adequate to support EIA management? Yes / No If no, what is missing?
2. What problems, if any, reduce public participation in the EIA process?
3. How should local capacity for training in EIA in Jamaica be increased?

### *Effectiveness: Identifying impacts*

1. What do you consider the major environmental problems of approved projects and why?
2. How should ecological assessments undertaken in the EIA process be improved in the following areas?
  - Impact prediction
  - Survey methodology
  - Cumulative impact assessments
  - Quantitative methodology
  - Mitigation measures

### *Effectiveness: Reducing impacts*

1. How can implementation of mitigation measures be ensured?
2. How should monitoring and enforcement in the EIA process in Jamaica be improved?

**You may provide additional suggestions/comments**



**APPENDIX E: DESCRIPTION OR CATEGORY OF ENTERPRISE,  
CONSTRUCTION OR DEVELOPMENT WHICH REQUIRE  
ENVIRONMENTAL IMPACT ASSESSMENT, NRCA Act Section 38(1) (b)**

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1. Power generation plants
2. Electrical transmission lines and substations greater than 69kV
3. Pipelines and conveyors, including underground cables, gas lines and other such infrastructure with diameter of 15 cm and over
4. Port and harbour developments
5. Development projects subdivisions of 10 lots or more, hotels or resort cottages of more than 12 rooms, airports including runaway expansion greater than 20%, housing projects of 10 houses or more office, complexes greater than 5,000 square metres
6. Ecotourism projects
7. Water treatment facilities including water supply, desalination plants, sewage and industrial waste water
8. Mining and mineral processing
  - . peat
  - . sand
  - . minerals - including aggregate, construction and industrial minerals
  - . metallic
  - . non-metallic
9. Metal processing
  - . non-ferrous metals
  - . ferrous metals
  - . foundry operations
  - . metal plating
10. Industrial projects
  - . chemical plants
  - . pulp, paper and wood processing
  - . petroleum production, refinery, storage and stockpiling
  - . fish and meat processing plants
  - . food processing plants
  - . detergents manufacturing, including manufacturing of soap
  - . manufacture of containers and packaging materials including cans, bottles, boxes and cartons
  - . distillery, brewing and fermenting facilities
  - . manufacturing of edible fats, oils and associated processes
  - . cement and lime production plants
  - . paint manufacture
  - . tanneries
  - . manufacturing of pesticides or other hazardous or toxic substances
  - . boxing plants
  - . citrus, coffee, cocoa, coconut, sugarcane processing factories

- . manufacture of textiles
- . solar salt production
- 11. Construction of new highways and arterial roads and major road improvement projects
- 12. River basin development projects
- 13. Irrigation or water management projects including improvements
- 14. Land reclamation and drainage projects
- 15. Watershed development and soil conservation projects including river training, check dams, and retaining walls
- 16. Modification, clearance or reclamation of wetlands
- 17. Solid waste treatment and disposal facilities
- 18. Hazardous waste storage or treatment or disposal facilities\*
- 19. Processing of agricultural waste
- 20. Cemeteries and crematoriums
- 21. Introduction of species of flora, fauna and genetic material
- 22. Slaughterhouse and abattoir
- 23. Felling of trees and clearing of land of 10 hectares or over for agricultural development
- 24. Clear cutting of forested areas of 3 hectares and over on slopes greater than 250.

***N.B. PROJECTS NOT LISTED ABOVE MAY REQUIRE AN EIA BEFORE A PERMIT IS GRANTED.***

**APPENDIX F: PROJECT INFORMATION FORM (NRCA, 1996)**

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THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT  
THE NATURAL RESOURCES CONSERVATION AUTHORITY  
(PERMITS AND LICENCES) REGULATIONS 1996

Note: Please read the following before completing this form.

1. This document is designed to provide information on your project to the Natural Resources Conservation Authority in accordance with section 10 (1) (a) of the Act in order to determine if the project requires the preparation of an Environmental Impact Assessment (EIA).
2. Please attach certified copies of all statutory approvals and planning permission granted to date and copies of all applications made and not yet determined.
3. This application form must be completed in order to avoid delay in its processing. Where attached sheets and other technical documents are utilized in lieu of the space provided, indicate appropriate cross - references. Paragraphs that are not applicable to your application should be marked N/A.
4. This form is supplemental to your **permit application form** and may be subject to further verification and public review. Provide any additional information that you believe will be useful in processing your application.
5. It is expected that completion of this form will be dependent on information that is currently available to you and will not involve new studies, investigation and research. Where such studies are required in order to provide the information please indicate and specify in each instance.

A. PROJECT NAME AND OWNERSHIP

1) NAME AND ADDRESS OF APPLICANT:

\_\_\_\_\_  
(SURNAME)

\_\_\_\_\_  
(FIRST NAME)

\_\_\_\_\_  
(TOWN AND PARISH)

\_\_\_\_\_  
(STREET)

\_\_\_\_\_  
(TELEPHONE)

\_\_\_\_\_  
(FAX)

\_\_\_\_\_  
(E-MAIL)

2) NAME AND ADDRESS OF OWNER (if different from applicant)

\_\_\_\_\_  
(SURNAME)

\_\_\_\_\_  
(FIRST NAME)

\_\_\_\_\_  
(STREET)

\_\_\_\_\_  
(TOWN AND PARISH)

3) NAME OF PROJECT

4) LOCATION OF PROJECT: (Provide map as well as address)

\_\_\_\_\_  
(STREET)

\_\_\_\_\_  
(TOWN AND PARISH)

- 4.1) Do you own the property on which you propose to carry to out this development project. Yes  No
- 4.2) If Yes Please attach certified copies of Proof of Ownership
- 4.3) If No, What is the nature of your interest in this property. Plea se attach supporting documents, justifying your claim

5) NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B PROJECT TYPE

Description or prescribed category of enterprise, construction or development for which approval is sought:

(Check and identify as many as are appropriate.)

1.  Power generation plants
2.  Electrical transmission lines and substations greater than 69 kV
3.  Pipelines and conveyors, including underground cables, gas lines and other such infrastructure with diameter of 15 cm and over.

4.  Port and harbour developments
5.  Development projects
  - subdivisions of 10 or more lots
  - housing projects of 10 houses or more
  - hotel/resort complex of more than 12 rooms
  - airports including runway expansion greater than 20%
  - office complex greater than 5000 square metres
6.  Ecotourism projects
7.  Water treatment facilities including water supply, desalination plants, sewage and industrial waste water
8.  Mining and mineral processing
  - bauxite
  - minerals - including aggregate, construction and industrial minerals
  - peat  metallic
  - sand  non-metallic
9.  Metal processing
  - non-ferrous metals
  - ferrous metals
  - foundry operations, metal plating
10.  Industrial projects
  - chemical plants
  - pulp, paper and wood processing
  - petroleum production, refinery, storage and stockpiling
  - food processing plants
  - fish and meat processing plants
  - tanneries
  - detergents manufacturing, including manufacturing of soap
  - distillery, brewing and fermenting facilities
  - cement and lime production
  - manufacture of textiles
  - manufacturing of pesticides or other hazardous or toxic substances
  - paint manufacture
  - boxing plants
  - manufacture of containers and packaging materials including cans, bottles, boxes and cartons
  - manufacturing of edible fats, oils and associated processes
  - citrus, coffee, cocoa, coconut, sugarcane processing factories
  - solar salt production
11.  Construction of new highways, arterial roads and major road improvement projects
12.  River basin development projects
13.  Irrigation or water management projects including improvements
14.  Land reclamation and drainage projects

15.  Watershed development and soil conservation projects including river training, check dams, and retaining walls
16.  Modification, clearance or reclamation of wetlands
17.  Solid waste treatment and disposal facilities
18.  Hazardous waste storage or treatment or disposal facilities
19.  Processing of agricultural waste
20.  Cemeteries and crematoriums
21.  Introduction of species of flora, fauna and genetic material
22.  Slaughterhouse and abattoir
23.  Felling of trees and clearing of land of 10 hectares or over for agricultural development
24.  Clear cutting of forested areas of 3 hectares and over on slopes greater than 25 degrees
25.  Other. Please specify! \_\_\_\_\_

If your project falls within the first 24 categories, then a permit under Section 9 of the NRCA Act is required.

Note: Other licences may be required if sewage or trade effluent are proposed to be discharged (Section 12).

These licences are subject to an **Environmental Impact Assessment** being submitted to the Authority. Contact the NRCA for further information.

C. SITE DESCRIPTION (physical setting of overall project, both developed and undeveloped areas)

1. General character of land: generally uniform slope \_\_\_\_ or generally uneven and rolling or irregular \_\_\_\_  
(check one)
2. Approximate percentage of proposed site with slopes  0-10%;  10-25%;  
 25% or greater.
3. What is the predominant soil type (s) on the project site?  upland plateau soils;  alluvial soils;  highland soils
4. Are there bedrock outcroppings on project site?  Yes;  No
5. Are there any karst or limestone i.e. sinkhole conditions on site?  Yes;  No

6. Is the project located in  flood plain or  coastal zone or  water catchment area?  No  
If no, specify \_\_\_\_\_  
\_\_\_\_\_
7. Site is  below Sea level;  at Sea level;  above the 10 m contour line.
8. Are there any water wells on or adjacent to the site?  No;  Yes; if yes please describe  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. Are there any rivers or streams or drainages within or adjacent to the project site?  
 No;  Yes; If yes, name the water body  
\_\_\_\_\_
10. Are there any lakes, ponds or wetland areas within or contiguous to the project site?  
 No;  Yes; If yes, name the water body  
\_\_\_\_\_
11. Present site land use:  Urban;  suburban;  rural;  industrial;  
 commercial;  agriculture;  
 forest;  other (please specify): \_\_\_\_\_
12. Is the project site presently used by the community or neighbourhood as an open space or recreational area?  No;  yes; If yes, identify  
\_\_\_\_\_

D. BIOLOGICAL RESOURCES

FLORA

1. General plant ecosystem and dominant types
- Forests
- . inland
  - . coastal
- Fields
- . agricultural
  - . pasture

- . open field
- Wetlands
- . mangroves
  - . morass and swamps
  - . seagrasses

Any other ecosystem types  yes  no, if yes please indicate.

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2. Name the watershed that your project is being developed in

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3. Are there exotic species present at the site?  Yes  No  
If yes, state the scientific and common names of these exotic species.

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4. Do you plan to introduce exotic species?  Yes  No  
If yes, state the scientific and common names of these exotic species and their places of origin.

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5. Are there any endangered animal species in the area where your project is to be developed?

Yes  No If yes, state their scientific and common names.

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6. Are there specimens of scientific or aesthetic interest in your project development area?

- . Lignum Vitae
- . Blue Mahoe



- . Orchids
- . Ferns
- . Mangroves
- . Sea grasses
- . Royal Palms
- . Bromeliads
- . Feeder trees for birds
- . Any others (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (iii) \_\_\_\_\_

7. Are there endemic species present at the site?  Yes  No  
If yes, state their scientific and common names.

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8. What is the degree of disturbance of the plant community?
- . pristine
  - . semi-degraded
  - . totally degraded

## FAUNA

1. General types

### Vertebrates

- . Mammals
- . Birds
- . Fishes
- . Amphibians
- . Reptiles

### Invertebrates

- . Insects
- . Corals (coral reefs)
- . Sponges
- . Crustaceans

- . Any others (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (iii) \_\_\_\_\_

Please provide a species list for general fauna types indicated.

2. Habitat type

Forests

- . inland
- . coastal

Fields

- . agricultural
- . pasture
- . open field

Wetlands

- . mangroves
- . morass and swamps
- . Seagrass
- . Coral reefs
- . Sea (marine)
- . Freshwater/brackish water
- . River/stream (any flowing body of water), state the name/names

\_\_\_\_\_

. Pond/lakes (any standing body of water), state the name/names

\_\_\_\_\_

Any others  Yes  No If yes, please state (i)

\_\_\_\_\_

(ii)

\_\_\_\_\_

(iii)

\_\_\_\_\_

3. Are there any commercially valuable species in the area?  Yes  No  
If yes, state scientific and common names

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PROTECTED AREAS

1. Is your proposed project located in an existing Protected Area?  Yes  No  
If yes, then name the Protected Area:

\_\_\_\_\_

E. PROJECT DESCRIPTION

1. Provide physical dimensions and scale of the project (fill in dimensions as appropriate)
- a) Total contiguous area owned by project sponsor \_\_\_\_\_ hectares
  - b) Project area developed: hectares initially \_\_\_\_\_; hectares ultimately \_\_\_\_\_
  - c) Project area to remain undeveloped \_\_\_\_\_ hectares
2. Operational aspects of the project
- a) Will there be sewage or trade effluent discharge during construction and or operation?  No;  Yes  
If yes describe the type(s), amount(s) and source(s). (If a discharge application has been prepared please attach.)
  - b) Is it  sewage or  trade effluent? (Tick please)
  - c) Please indicate what effect if any your project will or is likely to have on the following. (Tick appropriate categories)  
 Land resources,  Water resources,  Air quality (including noise),  
 Ecological resources,  
 Visual resources,  Open space and recreation,  Growth and character of community,  Energy,  Transportation,  Human health
  - d) Will there be air emissions (including fugitive dust) produced during construction and operation?  
 No;  Yes; If yes describe type(s) and source(s)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- e) Will there be any other poisonous, noxious or polluting matter discharged during construction and operation?  No;  Yes; If yes describe type (s) and source(s)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- f) Will blasting occur during construction?  No;  Yes  
g) Will project routinely produce odours (more than one hour per day)  No;  
 Yes

h) Total water usage per day \_\_\_\_\_ litres/day; source:  surface;  
 underground;  other: \_\_\_\_\_  
i) If water supply is from wells indicate pumping capacity \_\_\_\_\_ litres per  
min.  
j) Is surface or underground liquid waste involved?  No;  Yes. If yes  
indicate the type of waste (sewage, trade, including leachate,  
etc.) \_\_\_\_\_  
\_\_\_\_\_

k) If surface disposal, name receiving water body (fresh water, gully or marine)  
into which effluent will be discharged into.  
\_\_\_\_\_  
\_\_\_\_\_

l) Will the project use herbicides or pesticides?  No;  Yes. If yes, specify  
type(s) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

m) How many hectares of vegetation (trees, shrubs, ground cover) will be  
removed from the site? \_\_\_\_\_ ha.

n) Will the project involve the construction of access roads?  No;  Yes;

o) Will surface area of existing water bodies e.g. streams, rivers, bays etc be  
increased or decreased by the project?  No;  Yes; If yes, how much? \_\_\_\_\_.  
Give detail \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

p) Will project require relocation of  people;  houses; or  facilities?  
 No. If yes, give details:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

q) Does the project involve the disposal of solid waste?  No;  Yes; If yes,  
will existing municipal solid waste facility(s) be used?  No;  Specify  
location: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Where the project is a waste treatment and disposal facility please complete the  
following:

- 3.1 Nature of waste disposal facility (please tick) -
- a) Landfill;
  - b) Transfer station - incorporating also,
    - (i) static compaction;
    - (ii) pulverization;
    - (iii) baling;
  - c) Treatment plant involving -
    - (i) pulverization;
    - (ii) composting;
    - (iii) incineration;
    - (iv) chemical treatment;
    - (v) other treatment (please specify); \_\_\_\_\_
- 3.2 Estimated maximum quantities of general waste of the following description delivered or to be delivered daily at the facility: Liquid (tonnes) Sludge (tonnes) Solid (tonnes)
- a) domestic and commercial wastes -
    - (i) untreated; \_\_\_\_\_
    - (ii) pulverized or compost; \_\_\_\_\_
    - (iii) baled; \_\_\_\_\_
    - (iv) incinerator residues; \_\_\_\_\_
  - b) medical, surgical and veterinary wastes; \_\_\_\_\_
  - c) hazardous wastes
  - d) non-hazardous industrial wastes -
    - (i) potentially combustible substances; \_\_\_\_\_
    - (ii) inert and non-flammable substances; \_\_\_\_\_
  - e) wastes from the construction industry; \_\_\_\_\_
  - f) old cars, vehicles and trailers; \_\_\_\_\_
  - g) sewage, sludge etc.; \_\_\_\_\_
  - h) mine and quarry waste; \_\_\_\_\_
  - i) farm waste. \_\_\_\_\_
- 3.3 Current or anticipated maximum rate of use of the facility. (Specify as tonnes per day of landfill sites and tonnes per hour for treatment plant.) \_\_\_\_\_
- 3.4 State capacity of treatment plant: Current capacity \_\_\_\_\_ million litres per day (ML/d) Total design capacity \_\_\_\_\_ ML/d Proposed operational capacity \_\_\_\_\_ ML/d

4. Project approvals:  
a) Is there any other GOJ licence or approval required?  No;  Yes; If yes list approvals with responsible department or body \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b) List any previous licences or permits granted in respect of this project:

Date Project Title Reference No.

Issued: \_\_\_\_\_

Denied: \_\_\_\_\_

Other: \_\_\_\_\_

c) Are there any town or local approvals?  No;  Yes. If yes, list approvals and responsible agency.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

F. OTHER INFORMATIONAL DETAILS

Attach any other additional information as may be needed to clarify your project.

PREPARER'S NAME:

\_\_\_\_\_  
\_\_\_\_\_

PREPARER'S SIGNATURE

\_\_\_\_\_  
\_\_\_\_\_

TITLE: \_\_\_\_\_

\_\_\_\_\_

REPRESENTING:

\_\_\_\_\_  
\_\_\_\_\_

DATE: \_\_\_\_\_

\_\_\_\_\_

## **APPENDIX G: BASIC CHECKLIST WHICH CAN BE USED TO COMPILE THE DESCRIPTION OF THE ENVIRONMENTAL SETTING**

### **1. Basic Land Conditions**

#### **a. Geological Conditions**

- Major land formations (valleys, rivers)
- Geologic structures (sub-strate, etc.)
- Geologic resources (minerals, oil, etc.)
- Seismic hazards (faults, liquefaction, tidal wave etc.)
- Slope stability and landslide potential

#### **b. Soil Conditions**

- Soil conservation service, classification
- Hazard potential (erosion, subsidence or expansiveness)
- Natural drainage rate
- Sub-soil permeability
- Run-off rate
- Effective depth (inches)
- Inherent fertility
- Suitability for method of sewage disposal

#### **c. Archaeological value of site**

### **2. Biotic Community Conditions**

#### **a. Plant**

- General type and dominant species
- Densities and distributions
- Animal habitat value
- Historically important specimen
- Watershed value
- Man-introduced species
- Endangered species (location, distribution and conditions)
- Fire potential (chaparral, grass, etc.)
- Timber value
- Specimen of scientific or aesthetic interest

#### **b. Animal**

- General types/dominant species (mammal, fish, fowl, etc.)
- Densities and distribution
- Habitat (general)
- Migratory species

- Game species
- Man-introduced species (exotic species)
- Endangered species
- Commercially valued species

### **3. Watershed Conditions**

- Water quality (ground water and surface water)
- Source of public or private water supply on-site
- Watershed importance (on-site and surrounding area)
- Flood plain importance (on-site and surrounding area)
- Water run-off rate
- Streamside conditions (habitat conditions and stream flow rate)
- Location of wells, springs
- Marshlands, lakes, ocean frontage importance

### **4. Airshed Conditions**

- General climatic type
- Air quality
- Airshed Importance
- Wind hazard area (min/max speeds)
- Odour levels
- Noise levels
- Rainfall (average)
- Temperature (average highs and lows)
- Prevailing winds (direction and intensity)
- Fog conditions (hazard potential)



**APPENDIX H: COLLATION SHEET SHOWING THE PERFORMANCE OF EACH DOCUMENT TO THE EIA QUALITY REVIEW PACKAGE.**

<i>Review area 1: Description of the development, local environment, and baseline conditions</i>		Real Negril Hotel	Proposed Vendors Arcade	Couples Negril Hotel	Commercial Complex, Negril	Sea Splash Plantation Resort	Negril Harbor Hotel	RIV Tropical Bay Hotel	RIV Bloody Bay Hotel
Section 1									
1.1.1**	The purposes and objectives of the development are adequately explained.	B	B	B	B	B	B	B	A
1.1.2**	The design, size or scale of the development, and the nature and duration of construction and operation activities, are adequately described. Diagrams, plans, charts and/or maps are used effectively for this purpose	B	B	B	B	C	B	A	A
1.1.3**	The report adequately describes the environmental planning that went into the design of the project to minimize negative environmental effects and capture potential benefits.	B	D	B	B	C	C	B	B
1.1.4	Important design features, especially those for environmental planning and socio-economic management (e.g. pollution control, waste management, erosion control, handling of toxic or hazardous materials, worker services) are highlighted.	B	D	B	C	C	D	A	C
1.1.5	There is an adequate indication of the physical presence or appearance of the completed development within the receiving environment.	C	D	B	C	D	D	B	B
1.1.6	The nature and quantities of material need during both the construction and operational phases are described as well as, where appropriate, the nature of the production processes.	D	F	B	D	F	F	B	C

1.1.7**	The numbers of workers involved with the project during both construction and operation are estimated.	D	F	B	C	F	B	B	A
1.2.1**	The land area taken up by the development site is well defined and its location clearly shown on a map.	B	C	B	D	B	B	B	A
1.2.2	The uses to which this land will be put are described and the different land use areas demarcated.	B	C	B	C	B	B	A	B
1.2.3	Where alternate plans, designs or sites are being considered each is adequately discussed according to Criteria 1.2.1 and 1.2.2	F	F	F	F	F	F	F	C
1.3.1**	The types and quantities of waste matter, energy and residual materials and the rate at which these will be produced, are adequately estimated. Uncertainties are acknowledged and ranges or confidence limits given where possible.	C	C	B	D	D	E	C	B
1.3.2**	The ways in which it is proposed to handle and/or treat these wastes and residuals is indicated, together with the routes by which they will eventually be disposed of to the environment.	C	C	B	C	D	E	A	B
1.4.1**	The environment expected to be affected by the development is delimited with the aid of suitable scale map(s).	B	C	A	F	B	B	B	A
1.4.2**	The affected environment is defined broadly enough to include any potentially significant effects occurring away from the immediate project site(s). These may be caused by, for example, the dispersion of pollutants, off-site infrastructure requirements, traffic, etc.	B	C	B	C	C	F	A	C
1.4.3	The time horizon of the study is long enough to account for delayed effects.	F	E	C	E	F	E	C	C
1.5.1**	The important components of the affected environments are adequately identified and described. The methods and investigation undertaken for this purpose are disclosed and are appropriate to the size and complexity of the assessment task. An appropriate amount of fieldwork was done. Uncertainties are indicated.	B	E	B	C	C	D	B	B
1.5.2	Existing data sources were searched and, where relevant, used. These include local authority records and studies carried out by, or on behalf of, government and private sector organizations.	B	D	B	C	B	C	A	B

1.5.3	Local land use and development plans were consulted and other data collected as necessary to assist in the determination of the probable future state of the environment, in the absence of the project, taking into account natural fluctuations and human activities.	B	Proposed Vendors Arcade	B	Couples Negril Hotel	D	Commercial Complex, Negril	F	Sea Splash Plantation Resort	D	Negril Harbor Hotel	C	RIU Tropical Bay Hotel	C
Section 2	<i>Review Area 2: Identification, Analysis and Assessment of Impacts</i>		Real Negril Hotel											
2.1.1**	All important issues identified in the EIA terms of reference are included in the report. Deviations and exclusions are adequately accounted for.	B		D	B	B	B	E	E	C	C	B	B	B
2.1.2**	Direct and indirect impacts are identified using a systematic methodology (e.g. project-specific checklists, matrices, impact networks, expert judgment, and extensive consultations). A brief description of the impact identification methods is given along with the rationale for using them.	B		C	B	B	B	E	E	C	C	B	B	B
2.1.3	Due attention is paid to environmentally sensitive areas, to off-site, time delayed or recurring (e.g. seasonal) impacts and to cumulative or synergistic effects with existing and anticipated developments.	B		D	B	B	D	C	C	E	E	B	B	C
2.1.4	Consideration is not limited to effects which will occur under design operating conditions. Where appropriate, impacts which might arise from non-standard operating conditions, or due to accidents, are also included	D		E	B	C	C	D	D	E	E	A	A	D
2.1.5**	All phases of the project are considered e.g. pre-construction, construction, operation and decommissioning.	B		D	B	C	C	C	C	C	C	B	B	B

2.1.6**	Key impacts were identified and selected for more intense investigation. The scoping methods are described and their use justified	C	D	B	C	C	C	C	B	C
2.2.1**	Impacts are analyzed as the deviation from baseline conditions, i.e. the difference between environmental conditions expected if the development were not to proceed and those expected as a consequence of it.	C	D	B	C	C	D	B	B	B
2.2.2**	The data used to estimate the severity of impacts is sufficient for the task and clearly described. Any gaps in the required data are indicated and accounted for.	C	E	B	B	D	D	B	C	C
2.2.3**	The methods used to predict impact severity are described and are appropriate to the size and importance of the projected disturbance. The assumptions and limitations of the methods are explicitly discussed.	C	D	C	C	E	E	B	B	C
2.2.4	Descriptions of impact severity encompass the appropriate characteristics of impact (e.g. magnitude, areal extent, duration, frequency, reversibility, likelihood of occurrence).	B	E	B	C	E	E	B	B	B
2.2.5	Where possible, estimates of impacts are recorded in measurable quantities with ranges and/or confidence limits as appropriate. Qualitative descriptions, where necessary, are as fully defined as possible (e.g. 'minor' means not perceptible from more than 100m distance).	C	D	C	E	E	F	D	C	C
2.3.1**	The significance of all impacts which will remain after mitigation are described and clearly distinguished from impact severity.	B	D	B	F	F	E	B	C	C
2.3.2	The significance of impacts is assessed using appropriate national and international quality standards where available. Explicit account is taken of the values placed on affected environmental features locally, nationally and (where appropriate) internationally.	C	E	B	D	B	E	B	B	B
2.3.3	The choice of standards, assumptions and value systems used to assess significance are justified and the existence of opposing or contrary opinions acknowledged.	D	F	C	D	C	E	B	C	C
2.3.4	Wherever possible, economic values are attributed to environmental costs and benefits.	D	D	F	F	F	F	D	D	D
2.3.5**	Individuals, groups, communities and government agencies affected by the project are clearly identified.	C	C	C	C	C	D	C	B	B

**Review Area 3: Alternatives and Mitigation**

Section 3		Real Negril Hotel	Proposed Vendors Arcade	Couples Negril Hotel	Commercial Complex, Negril	Sea Splash Plantation Resort	Negril Harbor Hotel	RIU Tropical Bay Hotel	RIU Bloody Bay Hotel
3.1.1**	Alternative sites, processes, designs and operating conditions are considered where these are practicable and available to the developer. The main environmental advantages and disadvantages of these are discussed and the reasons for the final choice given.	C	F	E	C	C	E	C	B
3.1.2	Where possible, alternative construction strategies (e.g. timing, local versus imported labor) are considered and assessed for their environmental and socio-economic implications.	D	F	D	D	F	F	F	D
3.2.1**	Concerned stakeholders (e.g. individuals, groups, communities, government agencies) have been adequately consulted and their views accounted for in the development of mitigation measures.	D	D	E	D	E	C	E	C
3.2.2**	The mitigation of all significant adverse impacts is considered. Wherever possible, specific mitigation measures are defined in practical terms (e.g. costs, manpower, equipment and technology needs, and timing).	D	D	C	C	D	D	C	B
3.2.3	Any residual or unmitigated impacts are discussed and justification offered as to why these impacts should not or cannot be mitigated.	D	F	C	F	F	F	F	D
3.2.4	It is clear to what extent the mitigation methods will be effective. Where effectiveness is uncertain or depends on assumptions about operating procedures,	D	D	B	D	E	D	C	C

3.2.4	It is clear to what extent the mitigation methods will be effective. Where effectiveness is uncertain or depends on assumptions about operating procedures, climatic conditions etc, data is introduced to justify the acceptance of these assumptions.	D	D	B	D	E	D	C
3.2.5**	An effective environmental monitoring and management plan is presented to deal with expected; possible but uncertain; and unforeseen impacts caused by the project. Training needs are identified. The costs of the program are estimated. Developer and government responsibilities are distinguished, reporting and review procedures are specified.	F	F	A	D	E	E	C
3.3	Commitment to mitigation: the project proponent clearly expresses a commitment to, and capability of, carrying out the mitigation measures.	D	E	F	E	F	E	C
Section 4	<i>Review Area 4: Communication</i>							
4.1	Public involvement: there were genuine and adequate consultations with concerned project stakeholders to inform them of the project and its implications and to obtain their views on key issues to be investigated and managed. The scope and results of the public involvement program are adequately documented in the report.	C	F	E	E	E	F	C
4.2.1	There is an introduction briefly describing the project, the aims of the environmental assessment and how those aims are to be achieved.	B	C	A	B	B	B	C

4.2.2**	Information is logically arranged in sections or chapters and the whereabouts of important data is indicated in a table of contents or index. Terms of reference and data used in the assessment are included in appendices. The study team members are identified.	B	C	A	B	C	D	A	A
4.2.3	When data, conclusions or quality standards from external source are introduced, the original source is acknowledged at that point in the text. A full reference is included in a footnote or in a list of references.	C	C	A	C	B	E	A	B
4.3.1**	Information is comprehensible to the non-specialist. Tables, graphs and other graphics are used as appropriate. Unnecessarily technical or obscure language is avoided. Technical terms, acronyms and initials are defined, either when first introduced in the text or in a glossary.	C	B	A	B	B	B	B	C
4.3.2	The report is presented as an integrated whole. Data presented in appendices is fully discussed in the main body of the text.	B	C	A	B	C	C	B	B
4.4.1**	Prominence and emphasis is given to all potentially significant impacts, both adverse and beneficial, in a balanced manner.	C	B	B	C	C	C	B	B
4.4.2	The statement is unbiased and does not lobby for any particular point of view.	B	E	B	C	B	F	B	B
4.5.1**	There is an adequate non-technical summary of the analysis and main findings of the study. Technical terms, lists of data and detailed explanations of scientific reasoning are avoided.	D	F	B	C	B	C	D	B
4.5.2	The summary is comprehensive, containing at least a brief description of the project and the environment, an account of the main impacts and mitigation measures to be undertaken by the developer, and a description of any remaining or residual impacts. A brief explanation of the methods by which information and data were obtained, and an indication of the confidence that can be placed in them, is also included.	D	D	C	C	C	D	D	C

## **APPENDIX I: INTERVIEW QUESTIONNAIRE RESPONSES\*\***

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### **Legislation**

*What problems associated with the Jamaican EIA process are not being addressed by the existing legislative framework?*

1. Laws appear adequate for now. It is the implementation or lack of implementation of requirements/recommendations by law that is the problem
2. regularize content of EIA
3. certification of EIA consultants to ensure minimum acceptable standards
4. need for a more effective legislative framework, more laws need to be implemented and existing laws need to be addressed and upgraded, specifically where fines are concerned, fines need to fit the crimes or offences.
5. comes too late in the process
6. legislation doesn't adequately enforce/penalize developers for protocol breaches
7. too much power/influence of Minister, requires constitutional changes
8. content of EIA not stipulated by law (law only states one should be done)
9. lack of transparency in decision making within the Government
10. cumulative impact assessment, triggering impact, assimilative capacity, strategic environmental assessments
11. don't know

### **Implementation**

*Are logistics and infrastructure adequate to support EIA management? Yes / No If no, what is missing?*

No

1. manpower
2. quantity and qualified personnel/management (re: monitoring post-approval)
3. lack of scientific equipment
4. baseline/history for detailed reference
5. cooperation between regulatory bodies
6. lack of follow up on part of relevant agencies such as NEPA to ensure compliance with recommendations of EIA (e.g. in rural areas such as Negril, trees and seagrasses are removed without repercussion when its brought to light)

Yes

1. adequate within NEPA's scope based on small number of EIAs produced

*What problems, if any, reduce public participation in the EIA process?*



1. access to information on projects/public ignorance
2. education
  - a. public ignorance
  - b. administrators failing to maximize effort
  - c. lack of public information flow (1 police station or post office inadequate for public access)
3. lack of financial resources/money
4. lack of knowledge regarding the relevant agencies that may be consulted
5. developer alienating public discreetly
6. target audience assuming process is one of placation rather than genuine need to get audience opinion

*How should local capacity for training in EIA in Jamaica be increased?*

1. education - implementation of certificate or training programs
  - a. collaboration between government agencies, community groups and academia
  - b. increase number of educational programs in existence to increase awareness, skill handling and experience
  - c. registration/certification of EIA professionals
2. consultations with other countries and/or agencies regarding the EIA process should be encouraged

### **Effectiveness: Identifying impacts**

*What do you consider the major environmental problems of approved projects and why?*

1. inadequate information on baseline indicators to do trend analysis
2. loss of biodiversity – rich biodiversity in small space, any development will affect habitat of wildlife
3. waste management system – amount of waste that can be re-input on site, improper waste disposal, affordability, improper sewage disposal, size of project
4. prohibitive cost/affordability for thorough assessments and undertaking of mitigation measures such as relocating sensitive resources
5. lack of proper monitoring by government and developer during construction and operation
6. loss of recreational space
7. not sure there is a problem

*How should ecological assessments undertaken in the EIA process be improved in the following areas?*

- Impact prediction

1. Expend more time for thorough assessment (EIAs tend to be hastily done, not enough time for serious work)
  2. Balance developer and naturalist views
  3. More baseline data and/or research needed
  4. Increase the use of more reliable techniques to forecast impact such as: modeling techniques
  5. Use only qualified professionals (team of professionals needed, no one person can be adequately trained in all areas)
- Survey methodology
    1. Use qualified specialists
    2. Obtain and use proper equipment with latest technology and modern up-to-date methodology
    3. Increase use of GIS technology
    4. More time needs to be spent so that the survey is conducted in a sufficient and effective manner
  - Cumulative impact assessments
    1. Does not exist in Jamaican EIA system
    2. Improve ecosystem network analysis
    3. Improve forecast methods
    4. Broader than project site scope
  - Quantitative methodology
    1. More financing for comprehensive assessment
    2. Can be improved with qualitative methods
    3. Not always necessary (how much? Is it important? Plenty of nothing)
    4. Range of certainty prediction and long term economic benefits and cost needs to be applied of the natural environment
  - Mitigation measures
    1. Should be considered from the point of feasibility of possible monitoring efforts
    2. Should be considered from a sustainable point of view
    3. Should be designed bearing in mind Jamaica is a developing country
    4. Mitigation measures are often quite good
    5. Mitigation measures should indicate which party is responsible for implementing the specific activity and how it should be measured for compliance

### **Effectiveness: Reducing impacts**

*How can implementation of mitigation measures be ensured?*

1. employ team of credible professionals

2. ensure that there are more vigilant enforcement measures, thus environmental auditing should be conducted regularly to ensure that the mitigation measures are being adhered to.
3. improve manpower for compliance monitoring
4. institute and enforce penalty comparable to offence
5. strengthen legislative system
6. ensure implementation of mitigation measures
7. more consideration to be given to long term benefits of implementing mitigation measures
8. increase site visits from regulatory agencies along with substantial financial cost to developer for breaches as a possible deterrent

*How should monitoring and enforcement in the EIA process in Jamaica be improved?*

1. establish government research facility apart from those affiliated with academia to acquire baseline data
2. institute and enforce penalties
3. obtain/use proper equipment
4. improve public forum/public reporting
5. more intense/regular monitoring
6. improve objectivity (mistakes of previous EIAs should not repeat themselves)
7. reduce/eliminate unnecessary interference from *interest groups* and other influences

**Additional suggestions/comments**

1. EIA is simply a bureaucratic red tape that developers must do as a requirement before commencing a project
2. Upgrade existing laws, implement new ones, address the issues of fines thus making them more of a deterrent
3. Laws need to be reviewed periodically especially as it applies to the judiciary
4. Fines must be high enough to act as deterrent
5. Police need to assist on enforcement
6. Regulatory body need to be independent from government to properly carry out responsibilities
7. Long term economic impact of projects need to be examined
8. The use of qualified experts in the field needs to be a priority

\*\*names of respondents omitted due to confidentiality clause