Chapter 9

PREDICTED ENVIRONMENTAL IMPACT

9.1 THE RATIONALE

The basic objective of this Environmental Impact Assessment is to provide a means to integrate environmental factors that would enhance project planning. An EIA is also a decision making tool that contains an integrated and systematic process. It measures environmental consequences of development before its implementation, with a view to preventing adverse environmental impacts while promoting those beneficial effects of any particular project. The intent of the study is to identify those impacts which are likely to be generated by the implementation and operation of the project and to evaluate, as far as possible, the causes and effects of these impacts and their consequences for the environment and the local community. It also sets a benchmark for those parameters that would be impacted so that their subsequent monitoring would give out indicators on their status, whether there is a decline in quality or there are no changes.

9.2 METHODS OF IMPACT ASSESSMENT

Hotel development on small islands developing states like Mauritius requires an objective standardized process of risk and impact assessment. There are standard RISK/IMPACT ASSESSMENT TOOLS and accepted mitigation options for the most important ecological impacts, e.g.:

• Loss or degradation of habitat for terrestrial and marine species,
• Introduction of fresh water and nutrients to prevailing hydrology, and
• Injection of land-based sources of pollutants and contaminants to the physical environment.

This tool is a series of questions and appraisals in a standardized format to rank and prioritize
all potential impacts and their associated hazards and associated risks.
The key components to impact assessment include:

1. The presentation of a clear assessment process or methodology, with a clear set of priorities for ranking potential impacts. For resort development, the construction of golf courses with the land cover change has known and documented impacts in the construction and post-construction phases.
2. Management of expectations in the EIA process: Following the previous guideline, most controversies on risk assessment are differences in expectations. If impacts are clearly articulated, expectations will be consistent with the range of scenarios that are likely to occur with construction.

3. Informed participation of all stakeholders: A process by which stakeholders are education, informed, and participate in mitigation options is essential to the positive resolution to disputes.

Assessment Criteria are used to rank a source activity for its environmental impact. Each phase and component of the development is described and then evaluated for impacts, with mitigation options outlined.

In general, the overall significance levels could be defined as follows:

 Significant: a high impact corresponds to an effect upon a substantive area of any environmental or socioeconomic condition, with sufficient intensity and duration to generate significant change(s), and predominantly irreversible by natural means. The site condition or attribute would be limited or affected for a long term. Significant impacts also imply POTENTIAL HUMAN HEALTH IMPACTS as well.

 Moderate: a moderate impact is an effect upon a portion of any environmental or socioeconomic condition area. The effect occurs for a limited period, naturally reversible

in the medium-term, and the site condition affected is temporarily altered.

 Negligible: a negligible impact corresponds to an effect that is barely perceptible, of short duration, generates naturally reversible changes in the short-term, and does not diminish or alter the site condition.

Table6 Qualitative Assessment Criteria for Impact Assessment used in developing impact matrices

Qualitative Criteria	Choice	Description
NATURE	• Direct • Indirect	Refers to the origin/source of an impact – does the SOURCE activity DIRECTLY or INDIRECTLY act on the environmental target (species or natural communities).
TYPE	• Positive • Negative	Positive impacts imply species or natural communities will have a higher likelihood of persistence and increase in viability, Negative impacts imply the opposite.
LIKELIHOOD	• Not Likely • Potential • Certainty	*Not likely* means there is roughly a 10% chance of an impact occurring, *Potential* means 10 to 70% and *Certainty* means that in impact has a greater than 70% chance of occurring.
SCALE	• Specific habitats • Island environs • Regional • National or International	Scale of the impact will be defined as restricted to specific habitats, impacts that impact the entire island environment
DURATION	• Temporary • Long-term	Temporary refers to impacts that last less than 3 years, meaning species recover to

		pre-impact levels, or natural communities recover to no noticeable impacts. Long term refer to more than 3 years
REVERSIBILITY	• Reversible or • Irreversible	Reversible implies that the impacted species or natural community will recover, Irreversible impacts mean that the species or natural community is lost to the project site, and impact should be mitigated

9.3 THE LIKELY IMPACTS OF THE UNDERTAKING

Any development irrespective of the nature of the undertaking would generate impacts. There can thus be either direct or indirect impacts both qualitatively and in terms of quantity on the physical aspects of the environment, namely land use, soil and geology, flora, fauna, air quality, water quality, noise and the landscape. The impacts could also be positive or negative or a combination of both depending on the nature and complexity of the project. Apart from the impact on the physical environment this undertaking have a significant impact related to the socio-economic aspects, which include the effects on the population, employment, traffic, housing and community structure. An assessment of the likely impact of the project on these environmental components has been carried and elaborated in the following sections.

9.2.1 Impact on Land

The land resources would be impacted in the context of usage. Right now the site offers a large extent of land in a prime location for tourism development by virtue of its location on a coastal belt. However, the site is left idle.

The project would cause the execution of various tasks and activities on the site. Top soil and the soil cover would be disturbed through excavation works for building purposes. The land itself would be covered by permanent buildings and other infrastructure. Therefore the overall land mass constituting the plot would be modified by the permanent features such as villas, town house block, sports grounds and tarred roads. These are unrecoverable unless the units would be pulled down completely. On the other hand other components such as the landscaped areas and the golf course would result to value added effects on the terrain.

During the construction phase and operation phase waste that would be generated would be disposed of in the ground thus disturbing their inherent characteristics.

During the operation phase solid waste would be generated out from each dwelling unit and from the various activities that would run elsewhere within the premises. The biggest waste would be generated at the restaurant/kitchen. Wastes in the form of packages, tins, hygienic papers, oil and food would be generated. Food wastes arising as leftovers from guests

have also a significant bearing. This would bring an additional load of solid waste to the transfer station and an additional truck load that need to be disposed of in the landfill, thus more space required at the Mare Chicose landfill site.

9.2.2 Impact on air

The ambient air quality would be impacted through various excavation works that would occur on site. Machines and heavy duty equipment would be used for the road construction as well as for the building works. The movement of machines and trucks would no doubt give rise to dust emission. Material discharge and handling on site would also give rise to fugitive dusts.

The air quality may also be impacted by the vehicles exhaust. Right now the site is experiencing similar characteristics by the continuous movements of vehicles. During construction of the hotel project and during the operation phase the site shall have frequent access of vehicles, thus an incidence on the emission levels.

9.2.3 Impact on noise

Noise generation as a result of traffic movement and functioning of equipment would prevail. The noise from blowing vehicles horns, exchange of communication and conversation among workers are but a few examples of noise generation. The site is presently a source of noise generation especially at the primary crusher. Thus noise has to be controlled being given that other developments would occur in the neighbourhood of the present undertaking.

9.2.4 Impact on water

Water bodies, if any, would be impacted by disturbed soil and ground. Work activity would cause partial denudation of the vegetative cover. This would expose the soil surface that would be prone to wind and rain actions. There is a probability for windblown soil would be deposited in nearby lagoon. The run-off from rainfall would be loaded with soil particles and this might end their journey in the sea. However, the site does not have potable water boreholes and impact on fresh water is remote. There is no natural drainage towards the sea. Moreover the observation made on the longitudinal section from the sea to the site show an elevated dune on the sea frontage and on which the coastal road has been constructed, a depression that constitute the Pas Geometrique. The land rises beyond the Pas Geometrique to form a plateau where our site is.

9.2.5 Impact on Flora and Fauna

Any developments caused on land would disturb the natural habitat of the existing fauna. The birds and animals get disturbed and would be forced to

move out to look out for another niche. It may also happen that they even die and become extinct in the movement process. The development might also impact on the insect population that has a large contribution in pollen exchange processes.

9.2.6 Social Impact

Developments may also affect the society in that it could require the relocation of present land occupiers to another place. It is a fact that in Mauritius people would construct a dwelling where it suits their requirements though at times the people are simply squatters. The development of the land in question would therefore quash opportunities for other people to enjoy their present benefit or activity. Projects of the type proposed would also cause a migration of workers both from site and to the site depending on the aptitude of the worker with respect to opportunities. The project would also bring about a change in the mode of life of neighbourhood villages especially in terms of availability of jobs and the trend in earnings.

Social impacts may as well be extrapolated to gender issues. Villages are known to maintain conservative style of living especially towards women folks who stay at home and doing all the chores. The new development would provide jobs such as maids, servants, baby sitters, washerwomen etc. and it is foreseen that those women who traditionally were “kept” at home would now go out to earn a living. Self help organizations and women empowerment businesses would need to be exposed in order to benefit from the array of business opportunities arising out of this project.

Undertaking involving the flux of people of different country of origin might also create a sense of confusion with respect to “acceptability” of the cultural habits of the tourists. Villagers should be prepared to accept changes within their environs. Communication in a foreign language shall be a major obstacle to villagers who have poor educational backgrounds.

This undertaking shall be give rise to informal sector developments and this might encourage experienced entrepreneur who have good command over a few languages to come from elsewhere to invade the area and carry out business at the expense of local people who do not have such type of business acumen.

Moreover the supply of vegetable and fish products to the new undertaking as a matter of priority would impact on their availability on the local markets. This might create discontent among the villagers.

9.2.7 Economic Impact

This undertaking would bring both a financial and an economic impact when the project would be implemented. Apart from a direct investment the project would primarily give rise to direct and indirect job creations. Permanent and

temporary jobs would be created. The construction industry would experience a positive thrust.

The project would involve efforts from the finance sectors such as banks, insurance agencies, brokers and service providers who would benefit from the returns that would be generated.

However, with changes in the economic activity in a region it has been seen that the prices of commodities, vegetables and sea foods and fish also rise. They can reach a threshold that becomes unaffordable to the local villagers.

9.2.8 Traffic Impact

The project in question would generate an additional traffic flow under the construction and Operation phases. People coming to work, transportation of construction materials, transportation of finishes, furniture, cabinets, turf and the like are but a few examples where the trucks and vehicles would be travelling on the B59 coastal road. During the operation phase the movement of residents is expected to generate an increase in private cars and vehicles. A few vehicles would add on with respect to suppliers of goods, vegetables, and other services to the development as part of the logistics.

By virtue of the scale of the development it is expected that this project would bring along a vehicle count of 15 during construction period. With respect to the operation phase the vehicle strength can rise to 150 units in the long term.

A synthesis of the probable and likely impact of this undertaking on the environment is shown in Table 5 below.

Table 5: Summary of Impacts and Mitigation Measures

	Environmental Impacts	**Activities Causing the Impact/s**	**Degree of Impact before Mitigation**	**Mitigation Measure**
	Impacts on Soil			
1.	Loss of productive top soil due to site preparation and construction work	Re-profiling of land for house construction purposes, utilities embankments, hydraulic structures, approach roads and temporary access roads, foundation works	Low	Site soil conditions would be enhanced. Vegetative cover/landscaping anticipated after construction works
2.	Soil erosion caused by removal of vegetative cover	Construction of private dwellings, roads, temporary access	Negligible	Recover with normal vegetation as soon as

		roads, storage areas, excavation works for utilities etc.		possible. Landscaping of site incorporating ponds and lakes is mandatory for surface run-off intake
3.	Soil erosion/downwash caused by excavated loose soil and stockpile of debris	Improper storage of excavated soil	Low	Can be minimized.
	Impacts on Water Resources			
4.	Degradation of water , quality of rivers due to increased turbidity, (excluding activities being carried out upstream of site)	Earthworks during construction	NIL	No Water body
5.	Changes in flow dynamics in the rivers	Not likely to occur	NIL	No Water body
6.	Degradation of water quality in the river and/or groundwater due to pollutants	Escape of pollutants such as waste oil, grease due to run-off, accidental spills, etc from construction vehicles, and other services. Residual pesticides and fertilizers from application in green areas	Low	Groundwater monitoring to be carried out at regular interval. Irrigation to be stopped at slight change in groundwater quality.
	Modifications to water flow paths	Excavations in the ground for construction of access roads	NIL	No Water body
	Impacts on Air Quality			
7.	Degradation of air quality in project area	Vehicle emissions, dust, mixing of raw materials	Moderate	Refer to EMP
8.	Increase of noise pollution in surrounding areas	Operation of construction vehicles, equipment and other construction activities. Noise arising out of landscaped areas maintenance and	Moderate	Refer to EMP

		activities of hotel.		
	Impacts on Eco – Systems, Fauna and Flora			
9.	Loss or disturbance to terrestrial habitats due to clearance of land	Permanent residences, access roads, and buried services	NIL	No endangered species identified
10.	Loss or disturbance to aquatic habitats due to sedimentation	NIL	NIL	No water body
11.	Fragmentation of natural habitats/eco-systems in river bed	Nil	NIL	No water body
12.	Threats to local biota from invasive species	Construction material and vehicles	NIL	No Water body
13.	Impacts on aesthetic quality of the environment	Construction of dwellings and increase in traffic flow	Low	Complete construction in the shortest possible time, making use of allocated dumpsites. Houses to be constructed shall follow suitable specifications to enhance visual aesthetics. Cahier des charges applicable. Traffic flow minimization during operation though mass transportation
Impacts on Noise				
14	Impacts on tranquility	Increased number of trucks during site preparation. Movement sustained through construction of dwellings by private owners.	Moderate	Promote movement of trucks from Pte aux Piments Branch Road rather than the B35. Avoid working at night and during public holidays. Maintain a good PR with villagers constantly.
Impacts on Socio-economic activities				
15	Impacts on direct/indirect	Construction works for	Low	Generation of both

	jobs creation, procurement of goods and services and affordability	morcellement and subsequently the potential owners' houses		direct and indirect jobs. Informal sector and SMEs in the region to be given priority for provision of services. Maintain liaison with local NGOs, SMEs and Forces Vives
Impacts on Socio-Cultural activities				
16	Impact owing to intercultural mix	Willingness to accept People of "new" faith and religious groups in the existing set up.	Low	People in Mauritius have no racial or ethnic prejudices. Places of worship covering the major religions available near the site.