
CHAPTER 14

POTENTIAL CUMULATIVE IMPACTS

14.1 Introduction

Caye Caulker has undergone substantial changes as a result of planned and unplanned development over the years or more. The rapid development and expansion in the commercial and semi industrial sectors of Belize has resulted in physical land use change throughout the country. These increasing rapid development have been influenced by a number of external factors including:

- (i) Decline in communication and transportation costs as a result of Globalization and the growth of world trade,
- (ii) Increased trade in “Intermediate Inputs” and “Services” rather than finished “Products”, and;
- (iii) Many services not previously traded have become tradable – e.g., back office work, call centers. Tourism is one of the few non-tradable services left because it is location-specific.

These external factors have driven the country’s economic growth towards a greater investment in the service industry, specifically tourism and the entertainment sector. As a result, the GOB has pursued an aggressive tourism development policy that has led to the rapid development of areas that are potentially marketable in the tourism industry. One such areas experiencing these rapid transformations as a direct result of this policy is Caye Caulker. Increased number of hotels, restaurants, tourism centers, and high end subdivisions for retired and semi-retired persons can now be found throughout the caye

These activities have potential cumulative impacts to the area, but due to lack of data, its precise impact is difficult to ascertain. Based on this evidence, this chapter aims at discussing the direct cumulative impacts associated with the proposed project along with the social impacts (Impact Review) that can be encountered during project construction and operation. In addition, this chapter is further expounded in Chapter 16 which discusses the impacts and its possible mitigational measures.

14.2 Cumulative Impacts

Cumulative impacts occur in those situations where individual projects or actions may not have a significant effect, but when combined with other projects or actions, the individual project’s incremental contribution of adversity may cause an overall adverse cumulative effect. Cumulative effects may be additive or interactive.

Cumulative impacts to the Pelican Point Marina and Yacht Club include increased effluent loadings and its possible effects to the MBRs, land use changes, traffic, infrastructure, employment opportunities, and reduction in the abundance of flora and fauna. Table 16.1 of

Chapter 16 describes the cumulative impacts related to the construction, operational and maintenance activities of the proposed project.

14.2.1 Water Quality

Potential cumulative impacts related to this issue is primarily focused at the effluent loadings of the proposed project. Effluent loadings in the form of wastewater production will be minimal if not insignificant especially considering that the ‘excess wastewater’ will be injected into a deep well at about 100-75 feet deep (See Fig. 5.3b).

Moreover, the quality of the wastewater produced by the treatment plant is considerably excellent (See Table 6.6) with levels below the required DOE standards (See Table 6.4). Without this management, the activity can render significant negative impact to the receiving environment.

As can be seen from Figure 5.5, the water quality of the proposed project area is comparable to the eastern portion of the caye. The parameters were low and ‘acceptable’ for recreational standards and include nutrients, BOD, and turbidity.

As for the dredging activities, potential significant impacts can arise if the required mitigational measures are not in place. The most notable primary aquatic impacts arising from the dredging operations are expected to be an increase in sedimentation and turbidity, as well as an increase in BOD and hydrogen sulphide. These water quality impacts can both a direct and indirect impact to the receiving environment.

There will be three sets of dredging activities associated with the proposed project, viz: dredging of the north canal to increase the flushing effect, dredging of the large marina to accommodate the vessels and the dredging of the small marina and a small portion of the canal to accommodate the marina. The impact of dredging on the reef systems and to a larger part, the water quality, is predicted to be insignificant considering the location of the burrow pits coupled with the dredging volumes to be obtained. In addition, the prevailing current within the barrier lagoon is north to south virtually eliminating the risk of the reef being impacted by the dredging operation.

14.2.2 Land use related impacts

Land use related impacts will be minimal and considered insignificant to the receiving environment. This is mostly in part of the already cleared land in which the development will be located. Prior to the undertaking of this EIA, the developer was granted permission to subdivide the land and construct a residential canal network with two cul-de-sacs. Clearance was also granted for the removal of the mangrove forest. This activity, coupled with the fact that the area had been designated as a development site, resulted in the land being cleared.

In this regard, this activity has been deemed as an irreversible impact to the land with long term effects resulting in top soil erosion and water based erosion. This situation is presently the case and unless development takes place, this situation will eventually increase, especially in the beach area which has been heavily eroded.

14.2.3 Air, Maritime and Land Based Traffic

With the operation of the marinas and the construction of the project access roads, it is anticipated that there will be an increase in traffic in the area. The impacts however, may be both positive and negative in its endeavor. Marine traffic is expected to increase mainly due to the fact that the area has no full service marina in place. Activities at the marina will be varied and therefore it is anticipated that no long term environmental impact will be forthwith in considering the marine traffic.

Land based traffic will also increase, in part due to the constructed path that will enable the residents south of the proposed project to gain access to the project site and the village on a whole. This positive and beneficial impact would enhance the transportation factor of the area and increase the economic value of the lots further south.

In regards to the accidental impacts such as bilge water disposal and hydrocarbon spills and leaks, it is anticipated that the impact could be significant causing both direct and indirect effects upon the marine environment. Mitigation measures would include the prohibition of illegal dumping of the bilge water/wastewater, the rapid containment and cleaning up of hydrocarbon spills.

It is envisioned that air traffic will also increase as a result of the proposed project. This is partly due to the operation of the project which intends to attract as much foreigners and locals as possible. The cumulative impacts related to air traffic is mainly focused on the obstruction of the aircrafts approach. It is very dangerous for a marine vessel, especially the sailboat's mast to be in direct path with an incoming aircraft. The impact can result in two scenarios which include either an accident or an aborted landing. For the benefit of the proposed project, no such scenarios will occur as the project is situated within a safe zone and out of the aircraft's approach vector. In addition, mitigation measures will be developed to facilitate a safe landing.

14.2.4 Infrastructure Development

This activity will primarily be carried out in the construction phase and would involve both direct and indirect impacts as well as other construction related impacts. In this activity, the construction of the marinas, buildings, marina access road/path and installation of the utilities will impact the environment in some way. However, it is anticipated that the impacts will be not be significant whether they be direct or indirect. These include the construction of the marina access road/path where materials will be extracted and used for the building process.

This extraction process directly affects the site and indirectly affects the soil physical properties. Another example is the placement of the buildings whereby irreversible impacts would occur. Once constructed, the buildings will remain on site until decommissioned which could take a while to materialize.

14.2.5 Employment Opportunities

Some beneficial impacts that are cumulative are in the employment sector. All development within the area will serve to increase employment for the caye and region, thus resulting in migration towards the project site and adjacent areas. Positive cumulative social benefits include gainful employment, technology transfer, and net foreign exchange earnings.

14.2.6 Abundance of Flora and Fauna

Other cumulative impacts would be the reduction of species abundance. This would be applicable to the marine environment since the project site has been devoid of any habitat lands. In terms of the marine environment, the fauna affected would be invertebrates that include sessile marine organisms. The construction of the marina would not significantly impact the area but would pose short term irreversible impacts to some marine organisms.

Likewise, once in operation, the fishing stocks around the area could benefit positively by the tranquil waters found inside the large marina. These tranquil waters are produced by the wave attenuators installed to reduce the incoming wave energy.

14.3 The Impact Review

Development projects of any kind can modify or enhance the economic viability of a given area. The main purpose of the social impact assessment is to analyze those potential social, cultural, economic and transportation impacts, the proposed development may have on the immediate area and the region on a whole. Associated impacts will be analyzed for both positive and/or negative factors based on the proposal for resort development at its current site.

In view of proposed development activities, conditions relating to the construction and operation of the marina development at its current site was completed by examining those components that could potentially affect proposed activities:

- ▶ Likelihood and/or probability of impacts to occur
- ▶ Magnitude or degree of the impacts and significance
- ▶ Mitigating measures
- ▶ How the impacts can be reduced (mitigated) or prevented

In assessing the overall social environment, as it relates to the socio-economic, cultural, tourism and transportation conditions, the potential impacts of the proposed development may have on the area and the region, the following components were assessed:

- ↳ Existing and Proposed Activities
- ↳ Marine Traffic
- ↳ Road Access

- ك Disturbances (noise, air quality)
- ك Population/Housing
- ك Socio - Cultural
- ك Education/Health Services
- ك Employment/Safety
- ك Emergency Services
- ك Tourism Activities
- ك Economic Impact

14.3.1 Sources of Impacts

Determination and Evaluation

Project activities were divided for determination and evaluation of potential cumulative impacts:

- 1) Mag = Magnitude of impact (high, medium, low)
- 2) Dir = Direction of impact (positive, negative, no change)
- 3) Dur = Duration (months, years, decade)
- 4) Scope = area affected (local, long)

14.3.2 The Social Impact

Existing and Proposed Activities

- ▶ Location and size of project and existing uses
- ▶ Access to the area by traditional users
- ▶ Ability of traditional users to adopt to change
- Increase usage of the area of development by new comers

The proposed development site is north of the Caye Caulker airstrip. Land tenure in the immediate area and along this eastern coast is private holdings. The proposed project site is privately owned lands with several structures and buildings offering basic services such as refueling, snacks and water, there are no other nearby developments in the immediate vicinity of the development site.

The current development site and adjacent subdivision are for the most part devoid of vegetation. Information gathered indicates that some of the subdivision lots have been sold and are pending utility installation. With the advent of the proposed development, and an access road to the site, land values and the potential for additional private developments will increase. Existing users to and through the area, are the residents south of the project site and the traditional fisherfolk and local tour operators, mostly from the caye.

During the post-construction and other phases of development, marine traffic to the area and the region will increase. Seemingly, there will also be transportation of workers and materials to and from the site daily.

14.3.3 Marine Traffic

- ▶ Impact on traditional users to the area
- ▶ Increased number of users and vessels to the area
- ▶ Impact on natural environment by increased boat usage
- ▶ Safety for traditional and other users

The region in front of the development site has been traditionally used by yachts and catamarans that moor in the area and venture onshore to visit. It is expected that there will be a marked increase in the movement of marine vessels to and through the area of the development site during all phases. Marine traffic includes visiting tourists, barging services and other marine traffic to and from the development. Increase of marine traffic will require that safety measures be installed for users to and through the area of the proposed development.

14.3.4 Road Access

- ▶ Impacts from road construction on adjacent properties and the existing environment
- ▶ Transportation of construction materials and equipment during all phases of development
- ▶ Noise pollution from equipment and machinery transporting materials and supplies to the site

Presently there is a single road access to the development site and very limited access for the residents south of the proposed development. This road however, can support some heavy equipment and machinery. Because of the topography of the area, choices regarding road construction standards will be influenced by site characteristics and the value of the resources to be utilized.

14.3.5 Disturbances (noise, air quality)

- ▶ Noise pollution from the operation of construction equipment and machinery
- ▶ Disturbance from airborne pollutants, contaminants, from proposed activities

During the construction phase and completion phase, noise and air pollution will be one of the main impacts from equipment and machinery. Impacts on construction works on the environment include noise, dust and air pollution.

14.3.6 Population/Housing

- ▶ Temporary/permanent worker population increases
- ▶ Voluntary populations from elsewhere in the region
- ▶ Pressure on existing resources
- ▶ Demand for services
- ▶ Impacts on areas of ecological importance

Because of the demographic location of the proposed development, the area of the proposed development site will see increases in worker populations during all phases of construction. It is expected that voluntary populations from neighboring San Pedro and elsewhere in the region will be seeking employment within the new development.

The area of the development consists of both private properties and government owned land. The government owned land however, will not support any spontaneous or unplanned communities. Also, because of the topography the area and the site can only support general low density land use.

The demand for unavailable services not found at the site will put pressures on existing resources. Increased populations in the area and the region will also see impacts by users in areas of ecological importance.

14.3.7 Socio - Cultural

- ▶ Cultural displacement
- ▶ Pressure on existing customs and lifestyles
- ▶ Locals become marginalized
- ▶ Pressure on existing institutions and social groups

The village of Caye Caulker is where the core of the population of the island resides. Over the past two decades, because of growth tourism activities, the village has experienced increases in population growth from different cultural and ethnic groups, be it local Belizeans, Central American Immigrants or North Americans etc. This growth in and of itself has had great impact on the lifestyle, culture and social institutions in the village.

14.3.8 Education/Health Services

- ▶ Pressure on educational institutions by migrant worker populations
- ▶ Pressure on health and sanitary facilities by migrant worker populations
- ▶ Locals become marginalized by migrant worker population

The educational and health services of Caye Caulker are limited in these sectors. Because of the demographic location of the project, the relocation of additional immigrant populations to the caye will place a high demand for housing, schools and other ancillary services. The improvement or addition of health facilities will not only complement growing needs of the population of Caye Caulker, but will also afford additional available services and facilities for this tourist destination.

Because the health services on the caye are limited it is recommend that the Developer include in the project development on site emergency and health facilities for onsite personnel and visitors during and after project completion.

14.3.9 Employment/Safety

- ▶ Skilled laborers not employed during construction phases; unskilled laborers not trained
- ▶ Safety measures not installed for all laborers and employment types
- ▶ Security and safety of users and visitors to the area
- ▶ Endangerment of the marina and docking facilities to life and properties

Employment of locally available employable workers and safety issues are two main concerns within new development projects. Unskilled and untrained laborers can also prove very expensive to project development. Also of importance, are safety of new infrastructure development and the area of the proposed development, for employees, tourist and traditional users to and through the area of the terrestrial and marine environment.

14.3.10 Emergency Services

- ▶ Staff not trained in basic emergency procedures
- ▶ Emergency service not available on site during and at completion of project development
- ▶ Emergency facilities not available on the caye for employees, visitors and unrelated actions

In most development projects, emergency services are not necessarily built into project design as it is one of the least requirements of any development. In most cases, employees and visitors alike are seldom aware of dangers relating to project development activities.

14.3.11 Tourism Activities

- ▶ Impact of caye and marine attractions
- ▶ Carrying capacities of marine and caye sites
- ▶ Impact on fishery resources
- ▶ Disruption of tourist activities relating to marine traffic through the area

The proposed development site is west of the Caye Caulker Forest and Marine Reserve. The main concerns within the forest and marine reserves are impact related tourism activities within these areas. Increased boating activities in and through the area may also have some impact on fishery resource and on traditional tourist activities in the area.

14.3.12 Economic Impact

- ▶ Increased employment
- ▶ Increased economic benefits generated by direct expenditure
- ▶ Increased revenue for the forest and marine reserve
- ▶ Impact on fishery resources by traditional users

The proposed development will bring increased economic benefits to the area and the region. In respect to the marine reserve areas have been zoned for specific areas for activities by traditional users. It will generate both on-site direct employment and indirect supply-industry jobs and spin off for many other individuals and businesses. Jobs will be created at both local and national levels.

Local workers, especially in the village and the region will be needed throughout all phases of the project, and the income generated will boost economic growth and development. In addition, some of the construction materials like sand, cement, and gravels are available nearby with the capacity to supply a huge quantity of material for road construction.

14.4 Conclusion

In analyzing the cumulative impacts of the proposed project, the developer intends to undertake the necessary mitigational measures as described in Chapter 16 of this document. It is envisioned that these impacts will be addressed in order to ameliorate the potential negative impacts associated with the anticipated project and its implementation phases. As described in the document, much of the cumulative impacts also relate to the socio-economic concerns.