Strategies and Guidelines for Investing in Protected Areas in Belize

CONSULTANCY TO UNDERTAKE SOCIO-ECONOMIC AND ENVIRONMENTAL ASSESSMENTS OF PRIORITY PROTECTED AREAS AND DEVELOP STRATEGIES AND GUIDELINES FOR INVESTING IN PROTECTED AREAS AND THEIR BUFFER AREAS.

ALLAN HERRERA M.Sc.
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8/18/2013
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Consultancy to Undertake Socio-economic and Environmental Assessments of Priority Protected Areas in Belize and develop Strategies and Guidelines for Investing in Protected Areas and their Buffer Areas.

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STRATEGIES AND GUIDELINES FOR INVESTING IN PROTECTED AREAS IN BELIZE

Under the

CONSULTANCY TO UNDERTAKE SOCIO-ECONOMIC AND ENVIRONMENTAL ASSESSMENTS OF PRIORITY PROTECTED AREAS AND DEVELOP STRATEGIES AND GUIDELINES FOR INVESTING IN PROTECTED AREAS AND THEIR BUFFER AREAS.

Submitted By: Allan Herrera M.Sc.

August 2013
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ACRONYMS

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<tr>
<td>APAMO</td>
<td>Association of Protected Areas Management Organization</td>
</tr>
<tr>
<td>BEL</td>
<td>Belize Electricity Limited</td>
</tr>
<tr>
<td>BECOL</td>
<td>Belize Electric Company Limited</td>
</tr>
<tr>
<td>BTB</td>
<td>Belize Tourism Board</td>
</tr>
<tr>
<td>BTIA</td>
<td>Belize Tourism Industry Association</td>
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<tr>
<td>CBD</td>
<td>Convention on Biological Diversity</td>
</tr>
<tr>
<td>CBO</td>
<td>Community Based Organization</td>
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<tr>
<td>CBWS</td>
<td>Cockscomb Basin Wildlife Sanctuary</td>
</tr>
<tr>
<td>CCMR</td>
<td>Caye Caulker Marine Reserve</td>
</tr>
<tr>
<td>CDB</td>
<td>Caribbean Development Bank</td>
</tr>
<tr>
<td>CoP</td>
<td>Conference of the Parties</td>
</tr>
<tr>
<td>CZMAI</td>
<td>Coastal Zone Management Authority and Institute</td>
</tr>
<tr>
<td>DoE</td>
<td>Department of the Environment</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>ES</td>
<td>Environmental Statement</td>
</tr>
<tr>
<td>FAMRACC</td>
<td>Forest and Marine Reserve Association of Caye Caulker</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<tr>
<td>FCD</td>
<td>Friends for Conservation and Development</td>
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<td>FD</td>
<td>Forest Department</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GoB</td>
<td>Government of Belize</td>
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<tr>
<td>IUCN</td>
<td>International Union for the Conservation of Nature</td>
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<tr>
<td>LAC</td>
<td>Limits of Acceptable Change</td>
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<tr>
<td>LFS</td>
<td>Labor Force Survey</td>
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<tr>
<td>LLES</td>
<td>Limited Level Environmental Study</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>MMM</td>
<td>Maya Mountain Massif</td>
</tr>
<tr>
<td>MPA</td>
<td>Marine Protected Area</td>
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<tr>
<td>MPRFR</td>
<td>Mountain Pine Ridge Forest Reserve</td>
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<tr>
<td>NEAC</td>
<td>National Environmental Appraisal Committee</td>
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<tr>
<td>NGO</td>
<td>Non-government Organization</td>
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<td>NICH</td>
<td>National Institute of Culture and History</td>
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<tr>
<td>NPAS</td>
<td>National Protected Areas System</td>
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<tr>
<td>NPASP</td>
<td>National Protected Areas Systems Plan</td>
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<tr>
<td>OUV</td>
<td>Outstanding Universal Value</td>
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<tr>
<td>PA</td>
<td>Protected Areas</td>
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<td>PACT</td>
<td>Protected Areas Conservation Trust</td>
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<tr>
<td>PES</td>
<td>Payment for Environmental Services</td>
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<tr>
<td>PMU</td>
<td>Project Management Unit</td>
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<tr>
<td>PNLF</td>
<td>Persons not in the Labor Force</td>
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<td>SEA</td>
<td>Strategic Environmental Assessment</td>
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<td>SIB</td>
<td>Statistical Institute of Belize</td>
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<tr>
<td>TEV</td>
<td>Total Economic Value</td>
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<tr>
<td>TNC</td>
<td>The Nature Conservancy</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Education Scientific and Cultural Organization</td>
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<tr>
<td>VPNM</td>
<td>Victoria Peak Natural Monument</td>
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<tr>
<td>VIM</td>
<td>Visitor Impact Management</td>
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<tr>
<td>WCPA</td>
<td>World Commission on Protected Areas</td>
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<tr>
<td>WRI</td>
<td>World Resources Institute</td>
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<tr>
<td>WWF</td>
<td>World Wildlife Fund</td>
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Belize has an extensive system of marine and terrestrial protected areas organically built up over many years and managed by a diverse array of actors including public institutions, NGOs and private owners. Protected areas make a substantial contribution to the national economy yet in its present state it is grossly underfunded. This situation poses a grave threat long term survival of some PAs.

Protected areas must be able to attract and take advantage of all existing and potential revenue sources within the context of their overall management category and priorities. The current dependence on international funding and government financial support is not sustainable over the long run. In addition to traditional sources, innovative alternatives to traditional funding are needed to secure the long term viability of protected areas including private investments. This indicates the need to encourage responsible private investment within protected areas as part of a strategy to achieve financial sustainability while ensuring the protection of the supporting resource base. It is no longer feasible to divorce the questions of resource use and conservation, since the natural resources of this country are required by its government and citizens for national development.

A. Strategies to promote Responsible Investments

This report proposes and elaborates strategies and guidelines to promote investments in protected areas in the tourism, forestry, agriculture and fisheries, water resources, energy generation and oil and mineral extraction sectors. These areas comprise some of the most common private sector investments in protected areas and their buffer zones to date.

A SWOT analysis was undertaken to critically assess the Strengths and Weaknesses, Opportunities and Threats within the network of National Protected Areas to attract investments. Valuation is a useful tool which provides PA managers with information about the protected area’s goods and services and the values which potential customers place on them.

The report gives a set of strategies that can be used across the system to forward the cause of promoting investments in Belizean PAs within the six (6) sectors. It also gives sectors specific strategies that should guide development within each developmental sector. It also offers guidance on developing, implementing, managing and concluding an engagement with the private sector. This aims to ensure that engagements align with the protected area’s management philosophy and the Sector Investment Strategy.
B. Guidelines to Direct Responsible Investments

Although some impacts are likely to occur from projects within PAs and their buffer area it is very important that those impacts are within acceptable limits and do not unduly compromise the biodiversity protection mandate of the PAs.

The EIA process is one of the most powerful tools for vetting potential projects within PAs and their buffer zone since it looks closely at the environmental and social implications on a scheme on the existing environment. In the same vein many of the potential detrimental effects of projects on PAs and their buffer areas could be spotted and rectified early if Strategic Environmental Assessment were applied.

In carrying out assessments, best practice indicates that there is a hierarchy when assessing the importance of impacts on PAs. In this hierarchy, sites with international designations e.g. World Heritage Sites should be accorded the highest importance followed by National Sites with the lowest importance accorded to sites having local designations or only regional importance.

The assessment guidelines are predicated on the impacts identified from the consultations with stakeholders and investors undertaken earlier in the study and from observations made during the field visits to PAs. They are important, because they identify the areas of concern to stakeholders where they believe impacts are occurring and therefore areas that need to be addressed.

Within this report guidelines are presented for the six investment sectors. They express the pathway and the goals we want to achieve when contemplating sustainable investments in PAs and their buffer zones. They point to a level of improvement and a state of advancement towards achieving sustainable development and the protection of biodiversity. Guidelines indicate expectations about behavior and codes of conduct and set out specific actions that should be taken to comply with the principles of best practices.

Although some impacts from projects are inevitable there are positive and innovative steps that can be taken to compensate for the impacts. Two promising tools are:

**Biodiversity offsets** - This is a new and innovative tool being applied to developmental projects to compensate for through conscientious action within a defined area. There is significant potential for this mechanism to be applied to developmental projects in Belize falling within PAs.
Conservation Banking – This mechanism is now emerging as a way for developers, to take care of their environmental impact on biodiversity by protecting specific types of habitat and ‘selling’ that protected biodiversity to developers seeking to offset the impact of their developments elsewhere.

C. Identification of Impacts within Sensitive Sites

In Belize there are no standardize guidelines for the evaluation of impact significance. The absence of standardize guidelines make EIAs of little value and dubious worth in assessing the true magnitude of impacts from project activities especially when they fall within PAs.

Standardization of impact significance will allow for easier cross referencing through the use of common terms and gives reviewers of the ES a more objective platform from which to evaluate the significant impacts. This should not compromise on the need for objectivity and subjectivity in the professional judgment of the individual EIA practitioner.

D. Recommendations

The study offers a series of recommendations that will help to chart the way forward in creating the necessary enabling environment for investments within protected areas while also seeking to make the process more transparent and responsive to the needs of stakeholders.
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1 Introduction

The Global Environment Facility via the United Nations Development Programme is providing financing for the consolidation of the National Protected Areas System under the project entitled “Strengthening National Capacities for the Operationalization, Consolidation, and Sustainability of Belize’s Protected Areas System”. The project is being implemented by the National Protected Areas Secretariat, in concert with the Fisheries and Forest Departments. The primary aim of the project is to develop sound legal, financial, and institutional capacities to ensure the sustainability of existing protected areas.

As a result of the project, Belize is expected to have modernized and diversified financing mechanisms to increase the sustainability of its protected areas system. To accomplish this, various business and financial mechanisms will be used to increase protected areas revenue. However, it is necessary to undertake socio-economic and environmental assessment of selected protected areas as a precursor to the development of the various mechanisms. It will also be necessary to increase investments in protected areas and their buffer zones in a responsible and sustainable manner through the development of sector strategies and guidelines for the main productive areas.

The objectives of this consultancy will be achieved within the framework of the Project “Strengthening National Capacities for the Operationalization, Consolidation, and Sustainability of Belize’s Protected Areas System” – ‘PIMS4207’ according to the Project Document 00074617 and the Standard Basic Agreement (SBAA) between the Government of Belize and the United Nations Development Programme (hereinafter referred to as UNDP).

1.1 Objectives of the Study

To support the aim of achieving financial sustainability within the country’s protected areas system a Sustainable Financing Strategy is being developed by the National Protected Areas Secretariat (NPAS); however there is a need to inform the NPAS project on the extent to which elements of the Strategy can be applied within Belize’s Protected Areas System. In Component A of this study, nine (9) priority protected areas were chosen for socio-economic and environmental assessment. The result of that study has been published in a separate report (See Final Technical Report on the Assessment of the Priority Protected Areas and the Identification of Mechanisms and Avenues for Income Generation, Nextera 2012).

In addition to this, there is the need to explore the use of economic policies and instruments to influence development behavior and achieve conservation objectives. This indicates the need
to encourage investment within protected areas as part of a strategy to achieve financial sustainability while ensuring the protection of the supporting resource base. The development of sector strategies and guidelines for investing in protected areas, including their buffer zones will provide guidance for investors who want to invest in protected areas while enabling sector planners to appraise proposals for development in an informed manner. The development of these strategies and guidelines is the subject of this report and falls under Component B of this consultancy.

The objectives of Component B are as follows:

- Develop strategies and guidelines for investing in protected areas and their buffer by key productive sectors (tourism, forestry, agriculture and fisheries, water resource users, energy generation, and oil and mineral extraction). These guidelines should embrace the concept of biodiversity offsets to ensure that there is no net loss of biodiversity in the PA system as a result of developmental activities.

- Inform the National Environmental Impact Assessment processes on the importance of considering these guidelines in processes related to approval of development projects.
2 Methodology

PA systems must be able to attract and take advantage of all existing and potential revenue mechanisms within the context of their overall management category and priorities. Diversification of revenue sources is a powerful strategy to reduce vulnerability to outside shocks and externalities. There is a need for Protected Areas to become more financially self-sufficient by bringing in investments as long as they do not affect biodiversity values. In the same vein, Investments within the buffer zone region can help to relieve pressure for resources within protected areas.

Although a protected area is in the business of providing biodiversity services, it can use a business approach – profit-centered and entrepreneurial so as to maximize its financial capacity to achieve conservation aims. It is important to concentrate on the measures that are necessary to ensure that that investors use the resources of protected areas in a sustainable way and that they pay a fair price for the goods and services provided by the Protected Area. This suggests bringing an entrepreneurial, private sector perspective to Protected Areas management.

Valuation is a tool which can help PA managers to start thinking like a business manager by providing a structured approach for identifying real and potential customers, estimating appropriate prices for goods and services, and signaling ways of capturing those prices.

The following are the task within the ToR addressed by this report:

Task B-4: Development of Instruments

We took an analysis of current investments within the protected areas system so as to better understand the issues that encourage or discourage investments within protected areas and their buffer zones. It is essential that the needs and concerns of both the investor community and the protected areas managers and community leaders are understood. This allowed us to devise appropriate strategies and guidelines to promote investments in protected areas and their buffer zone region in a way that is responsible and sustainable and able to garner the support of the environmental managers who stand to benefit from increase revenue generation. This task was carried out in close collaboration with the protected areas managers, investors and developers.
Task B-5: Assessments and Analysis

A major effort was made throughout this consultancy to conduct a meaningful and inclusive consultation process. To that end, a structured questionnaire was produced for the assessment. The questionnaire was structured to be gender neutral, inclusive and engaging while being careful not to lead respondents in their responses. It was sensitive to the circumstances and expectations of the individuals or groups consulted and tailored to meet their particular requirements. Generally, consultations followed best practice guidelines and adhered closely to the guidelines given to the team by the NPAS.

Meetings were held with the NPAS and relevant stakeholders to determine which investors to consult in regards to investments in protected areas.

Task B-6: Consultations

It is critical that all relevant stakeholders are involved throughout the process to make the undertaking as useful as possible. Consultations were held with the PMU and the relevant stakeholders on the important findings, conclusions and initial recommendations. This meeting brought stakeholders up to date with progress and findings of the study while allowing for feedback and cross fertilization of ideas which fed into the training workshop and the production of the final report.

Task B-7: Production of Draft Report

As requested within the ITT, an Interim Report was produced for the NPAS. This report highlighted emerging findings and provided a guide to the progress of the assessment as a whole.

Task B-8: Development of Strategies and Guidelines

To gather the required information for analysis the team conducted a series of site visits to a select group of protected areas, conducted meetings with community members at select protected areas and buffer zones where investments is currently taking place and met with managers/local leaders and investors. In addition the team engaged public and private sector organisations/institutions responsible for investments in protected areas to garner their feedback and experiences.

The list included:

- Tourism umbrella organisations and tourism operators who have their resorts within or adjacent to protected areas. We looked at both inland and offshore resorts.
• Timber and secondary forest products industry which operate in protected areas or adjacency concessions,

• Agriculture and fisheries with major focus on fisheries operators who fish within and near to marine reserves and are subject to legislation mandating closed seasons and fishing exclusion zones,

• Water resource users which included the Belize Water Services Ltd. And Bowen and Bowen Ltd among others.

• Energy generation users including BEL, BECOL and Hydromaya. Protected areas as a whole have massive potential for the generation of renewable energy and are thought to have the best resource in the country.

• Oil companies prospecting for oil will be consulted. As a whole this group have great potential for investing in protected areas however much of this interest is presently unwelcome on the part of PA managers. A realistic set of guidelines can help to improve this situation. There is mineral prospecting in protected areas especially in the Maya Mountains and these operators were also consulted.

We took into account examples of positive outcomes and lessons learned. This helped us to identify limits of the ecosystem to acceptable change. We also investigated impediments which are currently constraining or discouraging further investments in protected areas and the buffer zone region. Based on the proper identification and analysis of these issues it was possible to build up a framework to guide future investments that can be deployed across the protected areas landscape.

Based on the outcome of this and further meetings with protected areas managers and buffer zone stakeholders, a set of Strategies and Guidelines was developed for investing in Protected Areas. The strategies and guidelines are presented in this report.

**Task B-9: Training on Strategies and Guidelines**

The ToR calls for a one day consultation/training workshop with the Department of the Environment and the National Environmental Appraisal Committee (NEAC) whose statutory remit includes the review of development proposals likely to have significant impacts on the environment. The focus of the workshop was to present and validate the findings/conclusions/recommendations of the consultancy study. The workshop included training on how best the DoE and its advisory support body, the NEAC can use the strategies and guidelines to encourage good quality, responsible investments into protected areas and
buffer zone regions. The training workshop was held at a time and venue agreed with the NPAS/PMU. Training materials/resources was provided for the workshop with the objective of empowering participants to use the tools generated by the study to their greatest advantage.
3 The Case for Investments by the Productive Sector in PAs

3.1 Financial Sustainability of PAs

The most pressing challenge facing protected areas worldwide is that of achieving financial self-sustainability in order to meet their conservation objectives. The threat to financial self-sustainability of our National System of Protected Areas threatens to undermine national and international efforts to preserve the planet’s biodiversity.

In Belize, these threats include inadequate investments, excessive dependence on international funding, lack of participation and support of key stakeholders including government ministries and the private sector. Other constraints include limited capacity of national institutions and inadequate financial planning tools. As a result of this situation, there are now only a few protected areas that can be considered financially sustainable, while the vast majority of protected areas continue to face dramatically high under investments with serious downstream implications on their ability to conserve biodiversity.

Protected area funding (from national and international sources) has simply not been able to keep pace with the rapid growth and associated management costs of the individual PAs resulting in a large financial gap even assuming business as usual (Drumm, 2011). In addition, the funding priorities of traditional funding partners have changed and evolved over time and can no longer be relied upon into the future. To that end it is necessary to begin thinking outside the box and investigate unconventional and unorthodox sources of funding and investments.

In tandem with this, and to create an enabling environment, it will be necessary to take into account aspects related to legislation, regulatory framework and policy, and the institutional capacities for adequate financial management. The effective interaction of all these aspects is essential for the country to be able to reduce or eliminate the financial gaps associated with management of the nation’s protected areas.

This consultancy proposes and elaborates strategies and guidelines to promote investments in protected areas in the tourism, forestry, agriculture and fisheries, water resources, energy generation and oil and mineral extraction sectors. These areas comprise some of the most common private sector investments in protected areas and their buffer zones to date. The objective is to provide a transparent and enabling environment for legitimate investments in PAs which respect the PAs and their mandate for biodiversity protection. Carefully well
planned projects within PAs and their buffer zones can create increased revenues for the management of such areas across their management programs while creating economic opportunities for buffer zone communities and increasing the value and importance of the PAs in the eyes of the buffer zone communities and nationally.

Not all investments in PAs will translate into income, especially those related to non-use values. Investments in PAs may nevertheless be justified even where the benefits take the form of non-marketed goods and services and indirect benefits of various kinds. In the same vein it is not always possible to realize a financial return from the goods and services provided by PAs. Some of these benefits are public goods and in a sense when the government provides funding for these entities the entire citizenry are in a sense investors in PAs.

3.2 Obligations to Fund PAs and Promote Private Investments

Internationally Mandated Obligations

Discussions on Protected Area (PA) finance have consistently formed a key agenda item during global deliberations on biodiversity conservation. Important milestone events include:

- Resolution 1.81, adopted at the 1st World Conservation Congress (Montreal, 1996), communicated a clear need for the IUCN to engage in constructive dialogue and collaboration with the private sector in order to achieve its Mission, urging “IUCN Members and the Director General, based on the need to influence private sector policies in support of the Mission of IUCN, to expand dialogue and productive relationships with the private sector and find new ways to interact with members of the business community”.

- The Vth IUCN World Parks Congress (Durban, September 2003) observed that insufficient investment is being made in biodiversity conservation in general and protected areas in particular. The meeting called for innovative approaches to generate the additional funding required ensuring that biodiversity of global, national and local significance is conserved.

- The 7th Conference of the Parties to the Convention on Biological Diversity (CBD) in 2004 committed 188 Governments to adopt the “Program of Work on Protected Areas,” including the financial sustainability of protected areas. CoP 7 committed governments to “by 2008, establish and begin to implement country-level sustainable financing plans that support national systems of protected areas, including necessary regulatory, legislative, policy, institutional and other measures”.
• Resolutions 3.060 and 3.061, adopted at the 3rd IUCN World Conservation Congress (Bangkok, 2004), provided further direction on IUCN’s private sector engagement, including a call for guidelines to be developed.

• IUCN’s approach for engaging with the private sector is framed in the 2004 Strategy for Enhancing IUCN’s Interaction with the Private Sector (hereafter referred to as the ‘Private Sector Strategy’ which was endorsed by the Council in 2004 under Council Decision C/60/58. While recognizing the different types of engagement, including direct confrontation and indirect lobbying, the Strategy focuses on facilitating and encouraging cooperative interaction between IUCN and the private sector to better implement the IUCN Programme. It establishes a vision statement and goals; states IUCN’s Principles of Engagement; outlines IUCN’s experience and niche; and provides criteria for prioritizing business partners.

• An international meeting on biodiversity science and governance (January 2005), hosted by UNESCO identified finance as one of several critical issues to be addressed if the world is to meet the CBD/WSSD 2010 Biodiversity Target. A particular concern in all of these processes has been the level and types of funding available for PAs, which lie at the core of global efforts to conserve biodiversity.

• During CBD COP 10, (Nagoya Japan 2010) nearly 200 governments came together to discuss, negotiate and decide on a global plan of action for biodiversity conservation. Together with WBCSD, IUCN promoted closer engagement between the CBD and businesses. Businesses were co-opted into drafting IUCN position papers for COP 10 on business-relevant topics such as business engagement, incentive measures, resource mobilization, and access and benefit sharing. The consultation with business also resulted in an information paper outlining the priorities for business engagement in the CBD’s agenda post-2010.

National Initiatives

Creating sustainable financial structures to fund Belizean PAs have been the Holy Grail of protected areas management in Belize. Efforts to put Belizean PAs on a sound financial footing goes way back but received renewed impetus in the early 1990s when a report was commissioned entitled “Revenue Generation Strategy for Protected Areas of Belize, (Aukerman and Haas 1992)”. This document provided the framework for, and provided the guiding principle for the creation of the Protected Areas Conservation Trust.

Subsequently the issue remained a strong agenda item with various observers and commentators calling for increased independence from government subvention and from the
uncertainties and vagaries of international funding. Although these calls generated little legislative action, the situation has continued to be the focus of numerous reports and recommendations.

A report commissioned by the NPASP and entitled “Sustainable Financing Mechanisms Belize’s Protected Area System” (Launchpad Consulting, 2005) offered concrete recommendations on how to achieve financial self-sustainability. Within the same year another report commissioned by the NPASP recommended that “The protected areas system should be able to generate the means to maintain itself financially and contribute to Belize’s national development. The costs of supporting the protected areas system shall be offset through the revenue generation derived from the value of the services provided” (Ching, 2005).

Since then the National Protected Areas Secretariat has commissioned other studies most notable of which is the report entitled “Sustainable Finance Strategy and Plan for the Belize Protected Areas System” (Drumm et. al. 2012). This report examined the current state of financing of Belize’s protected areas with a view of identifying weaknesses and gaps within the system and making recommendations for improvement.

Other relevant reports which addressed this issue include the reports “APAMO Financial Sustainability Strategy 2008-2012” (Launchpad Consulting, 2008) and “Increasing the Efficiency in the Collection, Administration and Investment of Protected Areas Fees in Belize” (Haas, 2012).

**Synergies with Current Initiatives to Support the NPAS**

It is generally acknowledged that the current fragmented state of PA management in Belize leads to deficiencies within the system limiting coordination and cooperation which results in overlap of responsibilities and inefficient use of limited financial human and material resources. This study is one of a number of important studies being commissioned by the National Protected Areas Secretariat with the aim of strengthening the management capacities of PAs in Belize through the development of appropriate legal, financial and institutional capacities.

The financial self-sustainability of the NPAS is of paramount importance to ensure its long term survivability. It has recently been determined using the UNDP financial sustainability scorecard that there are glaring gaps in the national framework for effective financial planning and financial sustainability for the PAs. Using this scorecard it was noted that Belize scoped well below the averages for Central America and the Caribbean in this important area.
This study and congruent studies, financed by the project are seeking to address this deficiency and to make the system more responsive to addressing its financial needs. In particular it complements the following studies and initiatives:

A. The Rationalization study – This study sought to avoid further erosion of the NPAS by raising awareness of the value of NPAS by highlighting its contribution to sustainable economic development and provision of environmental services. It sought to rationalize the system of PAs by reviewing their designation against their current role and values within the PA system.

B. Sustainable Finance Strategy & Plan – The Strategy and Plan called for the recognition of the contribution of the NPAS to the nation's economic well-being and advocates a system for demonstrating and communicating this value. It calls for the payment of Environmental Services through the creation of appropriate payment mechanisms for a raft of resources/services including forestry, fishing and water among others.

C. Mechanisms and Avenues for Income Generation - This study advocates the valuation of the services provided by PAs and the assignment of a value for those services. It also examines the potential of the PAs to generate revenue bearing in mind the limitations imposed by their management designation and other relevant factors.

**Summary**

For the most part, the case has already been made of the need to promote private investments as one of the pillars of PA financing going forward, however even with strong international and national mandates backed by global conventions and programs, the financial sustainability of protected areas and their continued survival is far from certain.

Belize as a part of the international community and a signatory to the international conventions is obligated to conform to these agreements. In responding to this international and national mandate, the NPAS is seeking to create progressive guidelines and strategies to streamline and regularize the process for private investments in select sectors.

### 3.3 Economic Contribution of PAs and the Case for Investments

In addition to strict conservation, scientific research and the preservation of wildlife habitat, many Protected Areas have great value in watershed and soil protection, carbon sequestration, recreational benefits, and the maintenance of cultural and spiritual values. Protected Areas are assuming a broader environmental and social role and becoming more flexible in their management aims and objectives. The range of Protected Area management categories reflect
these different objectives, however the core reason for establishing protected area is biodiversity conservation and this must always dominate over other objectives.

Protected Areas are often seen as public goods e.i. they contribute to the welfare of everyone. As the provider of public goods it is generally not expected that a Protected Area will generate enough money to equal or exceed costs. This is the primary reason why PAs are often carried by the public purse and funding for PAs (at least up to now) has usually comes in the form of endowments, grants and annual subventions.

The narrow, fickle view that PAs are a drain on public finances can be misleading however, since public money spent on protected areas is always spread into the larger community through the purchase of goods and services and the hiring of personnel. This process is repeated down the consumption chain thus the original expenditure can go through many rounds of re-spending, creating beneficial economic activity in the local economy.

The economic impact of the original spending can therefore be substantial. Since the recipients of the spending are the constituents of the public agency, it can be argued that the public agency (the government) benefits from the spending. This will be more pronounced near large population centers (e.g. Guanacaste National Park near Belmopan or Hol Chan near San Pedro) where leakage will be less.

In addition, since many of our protected areas receive grant funding from abroad, the funding of the protected area can be considered a benefit to the country and not a cost since it brings in foreign exchange and create jobs as well as demand for goods and services. In addition to this, PAs are the basis for many of the country’s most dynamic industries including tourism and energy generation.

In the future, Belizean PAs will be called upon to be more accountable to the public who will understandably demand value for money and want PAs to absorb a larger share of their operating cost. It is now generally accepted that the investment criterion with public money should be the same as with private money e.i. the benefit must exceed the cost. In Belize (as in all countries) most protected areas revenue do not counter balance costs. It is in this financial climate that protected areas managers are asking: Notwithstanding the value of the public goods provided, how can we justify the cost of the protected area on the public purse and where can we look for additional funding to make up the deficit?

3.3.1 Environmental, Economic and Social Contribution of PAs

The problem with protected areas is that they provide a range of benefits to society but are seldom recognized for their contribution since many of them are non-marketable goods or
goods for which markets have not yet been established (e.g. payment for environmental services such as clean air and water). If these benefits were taken into account, they would more than justify the existence of the protected areas and the public funds they receive.

Recognizing the importance of these contributions it is imperative to ensure that these benefits continue to flow to society and the PAs are recognized for these services and compensated. Belizean businesses in particular benefit from the existence of the PAs. It is not an outlandish statement to say that many businesses would find it difficult to continue trading without the managed resources of the PAs. Some of the most important benefits to businesses are:

1. **Tourism** - Protected areas provide an outlet to enjoy nature in a pristine environment. Visitors spend money on tour guides, gifts, food, transportation and accommodations. Businesses around the country benefit from this activity directly or indirectly but the benefit is particularly pronounced in buffer zone communities eg Placencia, San Pedro and Caye Caulker. Although there would still be some tourism without PAs, the existence of the PAs create sustainability and long term stability within the industry ensuring the continued quality and consistency of the product on offer.

2. **Raw Materials** – Many people obtain raw materials for arts and crafts from PAs. Local artisanal industries depend on this ready supply of raw materials. In addition, our PAs contain the best resources of thatching and poles for traditional houses, Sapodilla trees for chicle extraction and medicinal plants among others. For example the Sarstoon Temash National Park has the country’s best stands of Comfrey Palms (*Manicaria saccifera*) used for thatching.

3. **Natural Services** – Farmers in Belize get free pollination of their crops thanks to bees which are abundant in protected areas. Without this free natural service, farmers would have to manually pollinate their crops (as is the case in some parts of the world where the bees have died out).

4. **Watershed Protection and Provision of Water** – Most of Belize’s rivers originate in PAs or have most of their watersheds within PAs. The PAs absorb water during the rainy season and slowly release it ensuring an adequate supply into the dry season. This ensures a constant and sustainable flow of water for power generation, drinking and agriculture. If it were not for this, society would have to invest considerable amounts of money for water storage and treatment.

5. **Mitigation of Natural Disasters** - Protected Areas retain water to prevent flooding. This is especially important during hurricanes when huge amounts of water are dumped on
land. If it were not for the absorptive capacity of the PAs’ watersheds severe flooding would result endangering lives and livelihoods and cause significant erosion.

6. Marine and Freshwater Products – Protecting the reef, mangroves and spawning habitats are vital to ensuring a sustainable marine fishing industry. Fishing within rivers and lakes (locally known as lagoons) is an overlooked and underappreciated local industry on which many rural people depend. Protecting shorelines and rivers preserves the breeding grounds of fish, which also support the local fishing industry. For example in the dry season many people in Crooked Tree make a living fishing within the Crooked Tree Wildlife Sanctuary. Failure to protect these areas can lead to destruction of the fishing industry.

7. Incubator and Reservoir for Commercial Wildlife Species – Many people supplement their incomes and diet outside protected areas by hunting on public and private lands. The protection work within PAs serves to maintain viable populations of commercial species which repopulate areas outside the protected area impoverished by excessive hunting. In its absence, the hunters and gatherers could well be obliged to purchase protein equivalents in a market. The best example of this is out migration of fish from marine PAs.

Protected Areas do not always convey a benefit to businesses. Some activities that businesses carry out in Protected Areas or their buffer zones do not require the presence of the PA nor do they necessarily benefit from it e.g. mining or oil prospecting. There are even some commercial activities that are considered to be antithetical to protected areas. If the commercial activity is to be considered a benefit, it must itself benefit from the protected area.

In other instances the PA may be the cause of distress to neighboring industries e.g. when Jaguars from a reserve predate on the livestock of neighboring ranchers. This may be considered a cost of PAs to businesses and not a benefit. In the final analysis, the opportunity cost of the PA, or the benefits foregone because economic activities such as natural resource exploitation are prohibited in a Protected Area must also be considered.

3.3.2 The Motive for Private Investments in PAs

Businesses will want to invest in PAs and their buffer zone because it makes good business sense. This means that businesses will be able to recoup their investments and over time the financial benefits of the investments will exceed the cost. This is an important concept since the private investor will not necessarily make an investment in the Protected Area from a utopian philanthropic public interest perspective.
The reason that the government (public agency) can claim the impact of its investment as a benefit is that the recipients of the spending are the constituents of the public agency that represents them and is supposed to be promoting their interests. This is not the case for the private investor since he cannot use this argument to justify his investment in a PA which is not viable to his business as a revenue generator.

It we assume that the primary motive of the private investor is profit, then it is up to the PA manager to see how this seemingly selfish motive can be used to financially benefit the PA.

Beyond this, businesses are dependent on many of the services that ecosystems provide, such as raw materials, flood protection, nutrient recycling and water purification. Businesses are also increasingly aware of the opportunities that exist in the development of new biodiversity-friendly markets, sustainable technologies and business models. In other cases businesses may want to invest in PAs simply because it is good for publicity and gives the company a favorable corporate image.

### 3.3.3 Why Should Businesses Invest in Belizean PAs?

Many businesses depend on the underlying resource base for their survival. The richer and more robust the marketable resource base, the better the chances for business success. This is the reason why so many businesses want to invest in offshore PAs along the world famous Mesoamerican Barrier Reef while some biologically important inland PAs are completely overlooked.

Business ventures in areas such as tourism, forestry, fisheries and Energy will be attracted to Belizean PAs because the resources are more pristine, abundant and better managed under long term tenure. For example studies have shown that Belize’s marine protected areas have a higher abundance of commercial fisheries including conch and lobster than comparable areas not under protection (Cho-Ricketts et. al., 2006 and Cooper et. al. 2008). Hydropower companies can count on a viable watershed that will supply a reliable supply of water for their power generation needs.

Most of the country’s remaining commercial timber resources are in protected areas. Timber resources outside PAs are either exhausted or severely impoverished – the result of sustained uncontrolled overexploitation. Without protection under a sustained yield regime, these areas will continue to show declining populations of commercial species.

In this context it makes sense for businesses to invest in protected areas and their buffer zones with a view to maximize profits. By sustainably managing resources, the PAs are providing a positive externality which can be exploited by private business enterprises. It stands to reason
that in an era of tight budgets and diminishing financial resources, PAs will want to charge rent on the services they are providing. In this way both the PAs and the investors stand to benefit in a mutually beneficial relationship and happy coexistence.

In other areas such as renewable energy, the PAs have the best resource more as an incident of geography rather than as a deliberate and calculated management achievement. PAs within the Maya Mountain Massif because of elevation have the best wind resource and the best potential for hydropower generation. Protected Areas are also proving to have some of the best prospects for oil and mineral exploration. In these cases, businesses will simply have no choice but to work along with PA managers to achieve their business objectives.

Payment for Environmental Services (PES) seldom figures into the discussion on private investments for PAs, however on a system level and on the individual PA level it should be an important consideration. PES if enacted into national legislation and properly implemented can be an important and sustainable source of financing.

In its recent Strategic Plan 2011 to 2016 the Protected Areas Conservation Trust has PES as an action under its Strategic Objective to grow and sustain the fund. The Trust intends to pursue payment for environmental services options with private sector partners over its five year planning frame. Considering that the fund is used to finance conservation projects within PAs throughout the country it can make a useful contribution to PA revenue and financing.

Table 3.1 summarizes the risks and opportunities for investors within the Belize PA System.

Table 3.1: Potential risks & opportunity drivers for investors in the area of biodiversity and ecosystem in Belize.

<table>
<thead>
<tr>
<th>Driver</th>
<th>Sub-driver</th>
<th>Types and Examples</th>
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| Operational        | Scarcity of valuable natural capital            | • Security of supply (e.g. water for hydroelectric plant and domestic and industrial use);  
• Access to resources (e.g. due to demand for a few key resources such as fisheries or timber);  
• Potential conflict for resources (e.g. Xate and primary hardwoods);  
• Increase cost of raw materials (e.g. throughout the value chain e.g mahogany lumber);  
• Decreased access to land and potential resources (e.g. due to biodiversity protection efforts or private ownership). |
<p>|                    | Continued license to operate                    | • Companies restricted from operating in certain areas at various levels due to violation of local laws, local opposition or failure to follow best practice methods e.g Rosewood harvesting. |</p>
<table>
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<tr>
<th>Regulations</th>
<th>Government policies for conservation</th>
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<tr>
<td></td>
<td>• Regulations on the harvesting of wood or marine resources restricting harvestable areas or species.</td>
</tr>
<tr>
<td></td>
<td>• Identification of new or at risk habitats or species resulting in further harvesting restrictions.</td>
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</tbody>
</table>
| Taxes on use of ecosystem services or activities in highly valuable or threatened areas | • This could include coral reefs, intact high value forests, areas of high biodiversity or nationally threatened ecosystem.
|             | • Introduction of new charges and levies for use of natural resources (e.g. PES) impacting investors revenues and profit margins. |
| Moratoria on business activities directly impacting ecosystems | • Threatened species and habitats
|             | • Highly bio-diverse areas |
| Regulations in highly bio-diverse (sensitive) areas | Oil exploration offshore in natural critical habitats of high biodiversity value. |
| License to operate | Companies restricted from operating in certain areas due to depletion of resources e.g Rosewood harvesting. |
| Reputations | Strengthening brand and societal value |
|             | • Media and NGO campaigns e.g. Oceana campaign against offshore drilling;
|             | • shareholder concerns;
|             | • consumer preferences. |
| Capital     | Access restrictions or opportunities |
|             | Lack of access to credit as lending institutions forbid lending to environmentally hazardous project (e.g. Dams) or operations in sensitive areas. |
4 Strategies to Promote Sector Investments in PAs

Protected areas must be able to attract and take advantage of all existing and potential revenue mechanisms within the context of their overall management priorities. Diversification of revenue sources is a powerful strategy to reduce vulnerability to external shocks and dependency on limited government budgets.

It is no longer feasible to divorce the questions of resource use and conservation, since the natural resources of this country are required by its government and citizens for national development. To oppose the recognition of this fact will be counter-productive to PA management since it will alienate the national stakeholders who will come to see PAs as more of a hindrance than a benefit. In such a climate, public pressure may cause PAs to be re-designated or worst – dereserved.

Belize has considerable opportunities for revenue generation from its PAs through private sector investments, however that investment needs to take place in a guided, considered fashion that will produce the desired increase in revenue while maintaining (or even enhancing) natural biodiversity assets.

Belizean PAs must have the ability to plan for the future in a strategic manner. A logical connection must be made between mission and vision, and the strategies, programs and services provided. Mission requirements must be translated into performance, results and accountability. Key questions that PAs need to answer are:

- How can their mission be translated into investment enabling actions?
- How can they ensure good stewardship of natural resources while opening up more for business?
- How do they develop program alignment with mission, and organisational accountability?
- What do potential investors need and value, and how can the PAs create and maintain such values?
- In what processes/activities must PA Managers develop high levels of competency?

It is important for PA managers to understand the context in which they are trying to attract investments. For PAs which have detailed management plans this may already be well
articulated in their goals and scheduled to be achieved over a given time period. If financial self-sustainability is already a goal then increasing private investment readily fits into this goal.

Investors are subject to many pressures and influences, most of which have nothing to do with the individual characteristics of a given PA, but they can nevertheless affect whether or not an investor is likely to invest there. An understanding of the important issues facing investors is important in order to convince investors that investing in a particular PA is right for them.

**Lead Agencies** – The Forest Department and the Fisheries Department have management responsibility for most of Belize’s PAs hence they will naturally be the lead agencies. Notwithstanding this the screening, permitting and enforcement of regulations will require the input of many other public and quasi-public agencies. At the present time most Belizean PAs have limited capacities for business planning and management. Considerable assistance will be required from the lead agencies, international development agencies and better established NGOs.

### 4.1 Guiding Principles

Strategies to promote private investments in PAs must be guided by two (2) fundamental operative principles. These are the “precautionary principle” and the “sustainable use” principle:

**i. The Precautionary Principle**

The adoption of a precautionary approach implies that a flexible approach must be used in appraising projects. This approach seeks to balance a number of competing factors, including economic ones. The fundamental principle is that when there are threats of serious or irreversible damage to the environment and there is lack of scientific evidence to proceed with a given activity then the uncertainty should be grounds for postponing the project or certain components of the project until clarity can be achieved. Important points to note are as follows:

- **Threats**: The precautionary approach is triggered when there are threats or harm to the environment or human health providing there is reasonable grounds for concern.
- **Serious or irreversible damage**: In most cases the criteria for applying the principle is when the threatened damage has the potential of being serious or irreversible.
- **Lack of full scientific certainty**: Project proponents should not be allowed to use scientific uncertainty as a rationale for delaying protective action.
• **Cost-effective measures:** The measures applied should be cost-effective. This implies the need to achieve a balance between the cost and benefit of any proposed measures.

ii. **Sustainable Use Principle**

The principle of sustainable use was first adopted by the Convention on Biological Diversity (CBD), and has now become a global principle or concept which has great influence on the management and use of natural resources.

- The concept of sustainable use as defined by the IUCN and its global partners recognises that both consumptive and non-consumptive use of biological diversity is fundamental to the economies, cultures, and well-being of all nations and peoples. It further recognises that the use of wild living resources, if sustainable, is an important conservation tool as the benefits derive become a powerful incentive for responsible and sustainable use;
- When using wild living resources, great importance should be placed on minimizing the loss of biological diversity;
- The onus is on management to be adaptive and incorporate monitoring and modify management actions to take account of risk and uncertainty that ‘use’ of biological capital may entail. The developer should pay for the monitoring, however it is the responsibility of the PA manager to ensure it is carried out to a high standard.

In the final analysis, the investment must be seen to financially benefit the PA across its various management programs; however a good quality investment should also contribute to other areas including environmental. Investments which provide employment and services to buffer communities are clearly meeting an important social need while generating political support for the PA.

Consideration of these benefits should be the prime motivating factor in the PA supporting any investment. In the larger scheme of things, the primary objective should be in supporting and securing the national network of protected areas. Ideally all investments will fit into this view, however in Belize, in the larger scheme of things this can sometimes come into loggerheads with Governments development priorities.
4.2 Situational Analysis of PA Investment Attractiveness

4.2.1 Relevant National Factors

Policy and Regulatory Factors – It is recognized that political stability, democratization and empowerment of stakeholders, legislative and institutional frameworks and constitutional review process are critical success or failure factors influencing investors. In addition national security, transparency and accountability has great and underlying influence on investors.

There is a need to provide institutional legal framework for business operations of foreign investors under the same conditions for domestic companies. There is also the need to protect the property rights of foreign investors, and provide for the free flow of capital (transfer and repatriation of profits). Many governments in Latin America now accord the same rights to foreign investors as to local companies including the right to own large tracks of land. Important considerations are:

- Economic and political stability of the country,
- Local rules governing operations of foreign investors,
- Freedom of capital inflow and repatriation of profit,
- Regional and international trade agreements,
- Trade facilitation policies (tariffs, customs, free zones, etc.),
- Tax policies,
- Privatization policies,
- Intellectual property laws

Land Use Policy - All the sectors considered in this study will be affected by the recently introduced land use policy since their activities impact land use to one extent or another. Policy topics range from tourism, transport infrastructure, utility provision, mineral extraction, forestry, housing, conservation, commercial enterprise, agriculture, land allocation, and community development.

The land use policy address issues directly related to the use of land as well as land resources and public perception of land values in such areas as landscapes, social and cultural values, housing, agriculture, and infrastructure. It also addresses land resources in such areas as fertility, geology, ecology, and hydrology – and its perception – landscape and social values.

The Land Use Policy affects all activities (whether proposed or in effect) of all agencies that are likely to have an impact on the use of land and its resources, either directly (such as in agriculture or housing) or indirectly such as through social or cultural enhancement programs.
Economic and Technological Factors: Unpredictable exchange rates, escalating energy and food costs, high inflation rates; uncertain monetary and fiscal policies and economic trends influence to a great deal the behavior of investors. Availability of information and communication technologies, E-commerce, E-government and the internet are factors which influence (positively or otherwise) potential investors. Other important economic factors include:

- Market size and per capita income,
- Access to larger markets (regional and global),
- Access to resources and raw materials,
- Cost of resources and assets adjusted for productivity,
- Cost of skilled and unskilled labour,
- Cost of transport, telecommunications, utilities, etc.,
- Cost of intermediate goods,
- Access to marketing networks, reliable market data, and business associations,
- Access to technology, innovative capacity, and educated workforce,
- Reliable infrastructure (ports, roads, power, telecommunications, technical support),
- Financial and fiscal investment incentives
- Hassle cost reduction (corruption, bureaucracy, administrative inefficiency, etc)
- Investment services infrastructure (banking, capital market)

Environmental Factors: The major external factors are those that deal with the environment and its impact on wildlife management and conservation. In addition, lack of national land use policy and guidelines, and lack of compensation mechanisms for protection of Ecosystem are important factors. More importantly is a lack of any national policy to elucidate investments in PAs as is currently the case in Belize.

Socio-Cultural Factors: Increasing and high poverty levels and its concomitant high crime rates, changes in land use patterns, empowerment of communities are all vital factors to be taken cognizance of. Equally important are factors to do with wide income disparities, corruption and nepotism, natural disasters and incipient climate change.

Of relevance in the current context of land use is the call by indigenous Mayan Groups for communal land rights. In this regard, Mayan leaders are demanding a seat at the table and a say in regards to how land within their area will be used for development. This factor is figuring very prominently in recent oil exploration activity ongoing in the southern Toledo District.

Other important factors under this heading include the sequestration of carbon in private protected areas and the ownership of the sequestered carbon. This is akin to the ownership of timber on private lands. These are issues that need to be addressed going forward as current
legislation provides scant guidance on these matters or need to be revised to offer proper incentives to private land owners.

### 4.2.2 SWOT Analysis of Belize PA Investment Attractiveness

A SWOT analysis was undertaken to critically assess the Strengths and Weaknesses, Opportunities and Threats within the network of National Protected Areas.

**A. Strengths:** Over the years Belizean PAs have established operational, institutional and management structures which combine to form its core strengths. These and other strengths include:

- a. World class attractions including World Heritage Site,
- b. Abundant wildlife resources and attractive landscapes,
- c. Generally strong support and respect among Belizeans for the network of PAs,
- d. Accumulated knowledge gained in over 80 years of PA management experience,
- e. Spectacular caves and archaeological sites,
- f. Cultural diversity with easy mixing of the various cultures within buffer areas,
- g. Diversified attractions over a relatively small area,
- h. Proximity to the world’s most lucrative tourism markets (US and Canada with Latin America and Europe becoming increasingly important),
- i. Stable and mature financial institutions,
- j. Bilingual English and Spanish speaking population,
- k. Stable political structures,
- l. Strong national leadership and governance systems.
- m. Strong management structure in some PAs (especially in marine areas),
- n. Well established laws and institutions for the protection of natural resources,
- o. Good infrastructure and welfare facilities in some PAs,
- p. Educated workforce,
- q. Efficient decision making process,
- r. Effective zoning and land tenure framework in some PAs,

**B. Weaknesses:** Although there are many positive factors that could favourably attract investors to Belizean PAs, there are some weaknesses and deficiencies which must be taken into account.

- a. Lack of incentives to attract investors,
- b. Failure to distinguish our offerings from other regional competitors,
- c. Poor infrastructure and welfare facilities in most PAs,
- d. Uncontrolled poaching and other illegal activities in some PAs,
e. Poor or unmotivated management structure in some PAs,

f. The lead agencies (Forestry and Fisheries and some co-managers) are lacking in business skills and do not have the capacity to lead private investors who want to make investments in PAs.

g. Prevalence of criminal activities and general security concerns,

h. Lack of clear guidance for investors e.g. policy, zoning structure etc,

i. Lack of long term financial sustainability and uncertainty exacerbated by high national debt,

j. Negative publicity about some sectors including mining, petroleum and forestry.

C. Opportunities: Belize is well known worldwide for its expansive and comprehensive system of protected areas and the quality of its attractions. There are still vast opportunities for investors to make their contribution especially in tourism and energy generation among others. In addition, there is widespread Government and community support for projects which produce jobs and services. The present administration recognizes the need for better engagement of the private sector and has established an office for public-private sector dialogue to promote this.

There is generally good access to information and communication technologies countrywide plus a reasonably well maintained network of public and private roads leading into most PAs and buffer zone areas.

D. Threats: Despite the existence of vast opportunities and numerous strengths which favour the long term security of the Belize PA System, there are also a number of threats that affect the performance of national PAs. The threats include general insecurity in some parts of the country resulting largely from the influx of illegal drugs, weapons and illegal harvesting of forest products and minerals. In addition, poaching and human / wildlife conflicts, as well as illegal trade in wildlife products are real threats. These are coupled with environmental degradation and encroachment in PAs as a result of poverty and other socio-economic inequalities.

Communities living near to protected areas have high expectations of economic benefits to themselves as a result of investments within PAs and their buffer zones. Some of these expectations may be unrealistically high and can result in indifference, apathy and sometimes open hostility. In addition many PAs lack proper infrastructure and facilities including access.
### STRENGTHS
- Less than two hours away be air from the vast markets of North America,
- Great outdoors weather all year round,
- Abundant natural resources including land, water, timber and marine life,
- Unrivaled resources in the region including:
  - The Barrier Reef System (World Heritage Site),
  - Mayan Archaeological sites,
  - One of the largest cave network in the western hemisphere,
  - Large areas of terrestrial and marine areas under statutory protection,
  - Great diversity of attractions.
- Educated and mobile labour force,
- Well developed cruise ship industry bringing large numbers of visitors,
- Equal treatment and incentives for foreign investments,
- Relatively well developed infrastructure and services in some parts of the country including telecom,
- Many miles of white sandy beaches within the exuberant Caribbean setting,
- By far the biggest and best part of the Meso-American Barrier Reef, the second largest in the world,
- More than 66 protected areas (34% of the national territory),
- Presence of traditional "live cultures", including Garifuna, Mayan and Mennonites,
- Many incentives including fiscal, regulatory and financial measures, such as:
  - Short period for company registration,
  - Property rights protection, including

### WEAKNESSES
- Insufficiently developed infrastructure as a whole,
- High crime and insecurity exacerbated by the drug trade,
- Small local markets due to tiny population,
- Unevenly developed road infrastructure,
- Relatively expensive labour force when compared to the rest of the region,
- Extended time to get environmental clearance for projects in protected areas,
- Limited domestic consumption;
- Insufficiently developed technologies for sectoral progress;
- Inadequate level of know how (especially in management and technology skills);
- Poorly developed business skills on the part of PA managers which is discouraging private investors.
- Relatively high customs rates and excise duties,
<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
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<tbody>
<tr>
<td>🔄 State policy favouring foreign investment in all development sectors,</td>
<td>🔄 Recent privatization of the most important companies, resulting in investor apprehension;</td>
</tr>
<tr>
<td>🔄 Fiscal incentives at the sectoral level, and an appropriate legal framework,</td>
<td>🔄 Low level of transparency and efficiency of the public administrative system including the EIA process;</td>
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<tr>
<td>🔄 Authentic destination with a diverse supply, congruent with new international market traveling trends (culture and adventure tourism).</td>
<td>🔄 Low level of reinvestments and potential outflow of foreign capital through transfer prices and repatriation of profit (high leakage);</td>
</tr>
<tr>
<td>🔄 Government commitment to the programme of sustainable economic development,</td>
<td></td>
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<tr>
<td>🔄 Government commitment to private-public sector dialogue to bridge gap and find common interest,</td>
<td></td>
</tr>
<tr>
<td>🔄 Enabling fiscal policy and creation of favourable environment for foreign investors and their operations;</td>
<td></td>
</tr>
<tr>
<td>🔄 Political and macroeconomic stability,</td>
<td></td>
</tr>
<tr>
<td>🔄 Currency pegged to US dollar at fixed exchange rate,</td>
<td></td>
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<tr>
<td>🔄 Regionally competitive financial risk,</td>
<td></td>
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<tr>
<td>🔄 Conducive tax environment,</td>
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<tr>
<td>🔄 Well-developed capital markets,</td>
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<tr>
<td>🔄 High levels of privatization and respect for the private sector investment,</td>
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<tr>
<td>🔄 Well-developed telecom infrastructure,</td>
<td></td>
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<tr>
<td>🔄 Relatively highly educated labour force;</td>
<td></td>
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<tr>
<td>🔄 Free access to American markets through the Caribbean Basin Initiative.</td>
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</table>
4.3 Valuation of Services Provided by Belizean PAs

When looking for potential private investors, the PA manager must know what the potential investor wants from the relationship and what the PA has to offer and the true value of those resources. This will help to determine what the PA manager will need to communicate to the investor.

Valuation is a tool which provides PA managers with information about the protected area’s goods and services and the values which potential customers place on them. It can be used to identify which values are being captured and which are not, hence providing useful information for management and financing decisions regarding protected areas.

A thorough scoping stage of a valuation study identifies the array of benefits flowing from the protected area and the people who value those benefits. This information is likely to expose those who are not contributing to the protected area but derive benefits from it (and are therefore potential sources of funding e.g. fishermen), as well as those who are excluded from deriving benefits from the protected area but are carrying the burden of paying for the protected area (e.g. most taxpayers).

The following should be considered as part of the valuation process:

- Management category – protected areas fall under different IUCN or IUCN equivalent management categories. Categories I to IV are stricter and generally less amenable to outside interventions and commercial use while Categories V and VI designations has the potential to accommodate a wider range of use. Usually this use will be restricted to certain zones under a zonation scheme. In addition, certain very sensitive areas such as key biodiversity areas should be entirely excluded from any developmental activities.

It is important not to over generalize here and get away from the concept of PAs. Some investments such as large scale-industrial activities must never be allowed to occur in protected areas because their scale and impacts would seriously compromise the role of the PA. This would include large-scale commercial activities such as clear cutting, plantation establishment and other forms of industrial management, unrestrained (mass) tourism and other major infrastructure projects such as highways. Large-scale mineral extraction is also incompatible with protected area objectives under any designation.

Protected Area Planning Frameworks are used to design environmentally, economically and socially appropriate conservation areas based on biodiversity gap-analyses, cultural, and landscape values, and the level of threat, among other criteria and metrics. Project planners can use PA planning principles, frameworks and guidelines to help identify
areas of particular value, which should be excluded, reserved or managed in such a way as to retain their biodiversity and other values, and to identify areas more suitable for development.

All categories of Protected Areas are intended to be permanent designations which provide long-term protection to biodiversity and other values. The use of such categories, which envisage a degree of human presence and sustainable resource use, does not mean abandoning protection in these areas.

- Management capacity – Protected Areas that are well managed have a better chance of attracting some types of investments. Tourism in particular relies on a well-managed pristine resource base that will maintain those values into the long term, therefore tourist operators will favour those Protected Areas where resources are well managed. However the result of consultations carried out during this consultancy reveals that even forestry investments favour PAs that are well managed.

- Natural Attractions – Some protected areas are simply more attractive than others for a variety of reasons including landscape and natural setting, unique features, abundance of certain types of flora and fauna popular with visitors etc. Tourism tends to target protected areas that are more richly endowed with these natural attractions to the exclusion of other areas which may be important from a conservation perspective but not as visually attractive. These areas may not have the ability to draw tourists.

  An economic valuation study conducted at a local or national level can indicate which areas are most able to obtain funding from tourism and which are not. Tourism and recreation values are particularly attractive to managers because rent on the use of resources are relatively easy to capture and can be a source of significant funds.

- Natural Resource Base – Some protected areas may be attractive to investors because they are well endowed with natural resources that can be commercially exploited such as timber, minerals, water resources and renewable and non-renewable energy.

Essentially valuation identifies the values and attributes within protected areas and put a monetary value on them. This gives the PA manager a powerful resource when negotiating with potential investors. It also gives investor a good idea of the important resources/values of the PA and the effort that he must place to protect them.

Knowledge of the natural processes within the PA and of the functioning of the market place is needed to identify and assess the benefit to a potential investor. The assumption is that for each of the benefits identified, a real market can be found somewhere, trading in that benefit. If real prices exist for the benefit that the protected area is providing or can provide, it should
be possible to determine the real value of the benefit, without resorting to surrogate or artificial methods.

4.4 **Strategic Measures to Promote and Regulate Investments**

Investors are usually grouped into two categories these are:

1. **Strategic Investors** – These investors make investments as part of a broader strategy and although profitability is important it is not the only or prime driver. Rather the investment is made as part of a wider strategic consideration.
   a. Market seeking investors – are trying to gain market share and increase revenue by moving into new markets.
   b. Costs or value seeking investors – Are investors looking to reduce production cost and increase profitability by moving production to a new location where inputs such as land and labour is cheaper or productivity is higher. These investors are typically focused on the export market.
   c. Resource seeking investors – These are investors looking to gain access to key resources such as raw materials or specialized labour etc.

2. **Opportunistic Investors** – This group assess a target investment on the basis of profitability alone. The ultimate objective is to identify unique projects that offer the prospects of high rates of return.

There is limited possibility for targeting strategic investors for Belizean protected areas given the small size of the market, the low efficiencies and the high factor costs. The real prospect for Belizean PAs is to attract opportunistic investors to invest in specific projects that can offer a reasonable risk adjusted rate of return. The focus needs to be on how investors in Belize’s PA can differentiate themselves from other regional competitors with similar offerings.

Where differentiation is not possible then the focus must be on how we can compete effectively through other means such as product promotion and marketing and by providing incentives and an investor friendly business environment.

4.4.1 **System Wide Strategies**

**Table 4.1** gives suggestions of system wide strategies at the landscape level that could be used to forward the cause of promoting investments in Belizean PAs within the six (6) identified productive sectors.
**Table 4.1**: Propose System Wide Strategies to Promote Investments in Protected Areas Across the Six Sectors.

**Component 1: Legal, Regulatory and Institutional Frameworks**

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Descriptions</th>
<th>Comment</th>
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| **Strategy 1**: Carry out legal policy and regulatory support for revenue generation by PAs | (i) Laws or policies are put in place that facilitates PA revenue generation mechanism.  
(ii) Design and implement specific fiscal instruments for PA financial sustainability.  
(iii) Introduce a national policy on investment in protected areas.  
(iv) Fiscal instruments such as for payment for environmental services exist to promote PA financing.  
(v) Belize has signed up to and ratified UNFCCC agreements for participation in the CDM and REDD+. | - Funds collected by publicly managed PAs on behalf of government - money is not kept by PA hence no incentive to maximize revenue generation.  
- Currently there is great confusion as to what types of investments should be allowed in PAs and under what conditions.  
- The Acts provide general guidance on the purpose of the designations but scant guidance on allowable use and exclusions.  
- No payment for environmental services (such as water) exists. Introduction of such a scheme is contentious but called for in numerous studies and strategic plans including PACT Strategic Plan 2011 to 2016. |
| **Strategy 2**: Carry out legal, policy and regulatory support for revenue retention and sharing within the PA system | (i) Laws or policies are in place for PA revenue to be retained by the PA system (central and site levels).  
(ii) Laws and policies are in place for PA revenue to be retained at the PA site level.  
(iii) Laws and policies are in place for revenue sharing at the | - 100% of the fees collected by privately owned NGO managed PAs are used at site level.  
- Quasi-public managed PAs must pay 30% of their collected fees to PACT which redistributes funds through the |
### Strategy 3: Conduct economic valuation of individual protected areas.

(i) Economic valuation studies on the value of goods and services (benefits) produced by individual PAs are carried out.

(ii) PA economic valuation influences government decision makers and PA site managers.

- Very few of such studies have been conducted for Belizean PAs hence there is little guidance for PA managers to assess charges for the services rendered by their PAs.

### Strategy 4: Work to ensure staffing levels are well defined with incentives at site and system levels

(i) There is an organisational structure with sufficient number of economists and financial planners in the PA system (national and site levels) and sufficient authority to properly manage the finances of the PA system.

(ii) PA site manager’s responsibilities expanded to include financial management, cost effectiveness and revenue generation.

(iii) Budgetary incentives motivate PA managers to promote site level financial sustainability (e.g. sites generating revenue do not experience budget cuts).

(iv) Performance assessment of PA site managers includes assessment of sound financial planning, revenue generation, fee collection and cost-effective management.

(v) PA managers have the capacity to budget and plan for the long term (e.g. over 5 years) rather than on an annual cycle.

- Budgeting currently takes place on an annual cycle.
- Few management plans address financial planning issues in any great detail.

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**Component 2: Planning and Cost Effective Management Framework to Enable Beneficial Investments.**
### Strategies

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<tr>
<th>Strategies</th>
<th>Descriptions</th>
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| **Strategy 1: Engage in PA site-level business planning** | (i) PA management plans include conservation objectives, management needs and costs based on cost-effective analysis.  
(ii) Management plans directly address PA economic sustainability and incentives for investments.  
(iii) PA management plans used at PA sites across the PA system and are standardised.  
(iv) Business plans, based on standard formats and linked to PA management plans and conservation objectives and financial sustainability are developed across the PA system.  
(v) Business plans are implemented across the PA system.  
(vi) Business plans for PAs contribute to system level planning and budgeting and guide/facilitate private investments. | - Currently some PAs still do not have management plans, while many others have plans that are outdated.  
- Few management plans address revenue generation and investments.  
- Very few business plans exist across the system and those that do are usually project specific. |
| **Strategy 2: Set up an Operational, transparent and useful accounting and auditing system at the PA level** | (i) There is a transparent and coordinated cost (operational and investment) accounting system functioning for the PAs.  
(ii) Revenue tracking system for each PA is in place and operational.  
(iii) There is a system so that the accounting data contributes to system level planning and budgeting. | - Only some PAs (mostly those managed by larger NGOs) have developed this capacity.  
- Accounting data that contributes to system level tracking is not in place but is sorely needed for long term strategic planning at the system level. |
| **Strategy 3: Put in place system for monitoring and reporting on financial management** | (i) All PA revenue and expenditure are fully and accurately reported by PA authorities to stakeholders and GoB.  
(ii) Financial returns on investments are measured and reported where possible (e.g. track changes in revenues before and after investment). | - Only a few PAs have the capacity to accurately track revenue and expenditure.  
- No analysis is done across the system to show value for money on |
(iii) A monitoring and reporting system in place to show how and why funds are allocated across PA sites and the central PA authority.

(iv) A reporting and evaluation system is in place to show how effectively PAs use their available finances to achieve management objectives.

**Strategy 4: Training and support networks to enable PA managers to operate more cost-effective PAs**

(i) Guidance on cost-effective management developed and being used by PA managers.

(ii) Inter-PA site level network exists for PA managers to share information with each other on their costs, practices and impact.

(iii) Operational, and investment cost comparisons between PA sites complete, available and being used to track PA managers performance

(iv) PA site managers are trained in financial management and cost effective management

(v) PA financing system facilitates PAs to share costs of common practices with each other and within the system.

- There is an identified need for cross subsidization and the development of a “buddy” system among Belizean PAs so that those with more developed capacity can strengthen the weaker PAs especially those that are community managed or recently declared.

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**Component 3: Tools for PA Revenue Generation Through Investments**

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<tr>
<th>Strategies</th>
<th>Descriptions</th>
<th>Comment</th>
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<tbody>
<tr>
<td><strong>Strategy 1: Marketing and communication strategies for Investment promotion</strong></td>
<td>(i) Up-to-date analysis of revenue options for the country’s PAs complete and available including feasibility studies;</td>
<td>- This could be done in tandem with Beltrade and BTB.</td>
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<tr>
<td></td>
<td>(ii) Communication campaigns and marketing for private sector investors are widespread and given high profile at</td>
<td>- This could be the subject of the upcoming business plans to be produced for individual PAs under the</td>
</tr>
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</table>
### Strategy 2: Bring PAs into alignment with investment promotion initiative

- (i) The NPAS has clearly articulated the need for PAs to contribute more to national economic development.
- (ii) The NPAS has clear rules and guidelines in place to guide private sector investments in PAs including promotion of EIA guidelines to vet projects.
- (iii) PA management understand the need to promote private investments in PAs.
- (iv) The PAs are using PA planning frameworks to identify areas most suitable for development.
- (v) PAs have reviewed the strategy and guidelines and have adopted a common approach to promotion of private investments.

**NPAS project**
- To reduce cost this effort needs to be taken at the national rather than the PA site level.
- PAs should improve their websites and polish their offerings to investors.
- PAs should increase their visibility at trade fairs and cultural events and promote their offerings.
- There is wide disparity among PAs about allowing private investments and the types of investments to be allowed.
- The NPASP has already indicated the need for PAs to contribute more to national economic development.
- There is a need to seek a balance between the continuous observance of environmental principles of the PA and the interest and prerogatives of the investor community.

### Strategy 3: Operational PES scheme for PAs

- (i) A system-wide strategy and action plan for PES is complete and adopted by government.

**NPAS project**
- Payment for environmental services has longed been talked about as a possible
| Strategy 4: PAs prepared to participate in UNFCCC programs including CDM and REDD |
|---|---|---|
| (i) | Conduct extensive publicity and PR campaign to get citizen and stakeholder buy in to PES. | income source for PAs, however political considerations (based on consumer concerns about prices for utility services) has hindered progress. |
| (ii) | Pilot PES schemes at select PA sites developed including Chiquibul and Mountain Pine Ridge. | - Despite this, there is vast potential for use of this investment vehicle as a sustainable and justifiable revenue source for PAs. |
| (iii) | Operational performance of pilots is monitored, evaluated and reported. | |
| (iv) | Scale up of PES across the PA system is under way. | |

**Strategy 4:** PAs prepared to participate in UNFCCC programs including CDM and REDD

- Conduct extensive publicity and PR campaign to get citizen and stakeholder buy in to PES.
- Pilot PES schemes at select PA sites developed including Chiquibul and Mountain Pine Ridge.
- Operational performance of pilots is monitored, evaluated and reported.
- Scale up of PES across the PA system is under way.

**Strategy 5:** Concessions operating within PAs

- Belize has become eligible and has signed up for participation in the financial mechanisms under the international conventions.
- Human and institutional capacity has been developed within the country to assist PAs wishing to participate in these schemes.

- At least one study has been carried out to determine the capacity of the country to participate under the CDM but up to now no projects are running, however there are currently moves afoot to prepare the country to participate more effectively.

**Strategy 5:** Concessions operating within PAs

- A system-wide strategy and implementation action plan is complete and adopted by the government for concessions.
- Concession opportunities are operational at PA sites levels.
- Operational performance (environmental and financial) of pilots is monitored, evaluated, reported and acted upon.
- Scale up of concessions across the PA system is under way.

- There are currently concessionaires working within individual PAs, however there is no standardized system for monitoring and evaluation nor is there a system for sharing lessons learned for deployment into other PAs.

**Strategy 6:** PA training programs on revenue generation mechanisms

- Training courses run by the government and other competent organizations for PA managers on revenue mechanisms, financial administration and marketing.

- This could be done through Beltrade, the DFC or other organizations specializing in business and financial management.
**Component 4: Implement Investment Promotion Program**

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<tr>
<th>Strategies</th>
<th>Descriptions</th>
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| **Strategy 1:** Identify Potential Areas for Investment. | (i) Individual PAs identify potential private investment revenue generation opportunities.  
(ii) Create a national inventory of investment areas within PAs and buffer zones.  
(iii) Rules and regulations for the management of franchises and concessions have been drawn up using broad based stakeholder participation.  
(iv) Draw up new environmental regulations to give greater powers to private sector interest in the management of protected areas. | - Much of this information should already be available within the existing management plans but if not, all future plans should include this information for financial planning.  
- PAs will need to endorse idea of necessary partnership with private investors to achieve financial self-sustainability. |
| **Strategy 2:** Identify Priority Sites/projects for investment based on likely rate of return and potential for sustainability. | (i) Carry out SWOT analysis of potential investment schemes.  
(ii) Select priority schemes for investments based on likely chances of success and least impacts.  
(iii) Cross subsidization of PAs required under this approach. | - The generation of revenue for PAs is important but it should not supersede the need to protect biodiversity values.  
- This approach may mean investments going into flagship protected areas, however cross subsidization within the system will ensure all PAs benefit. |
| **Strategy 3:** Focus on projects with potential for value added and which can stimulate buffer zone economies. | (i) Include stakeholders from buffer zone areas in review and selection process.  
(ii) Consider inclusion of buffer zone communities in investment program and the utilization of their facilities and | - Few investments currently use this model. Usually buffer zone communities provide labour but are not seen as full partners or owners. |
### Strategy 4: Develop strategic guidelines for investors in each thematic area.

- **(i)** Appropriate guidelines have been drawn up to regulate private investments in PAs and buffer zone areas.
- **(ii)** Guidelines are being used by the National Environmental Appraisal Committee (NEAC) to vet projects.
- **(iii)** There is an appreciable increase in the number and quality of investment projects approved for PAs and buffer areas.
- **(iv)** Infrastructure investment is proposed and developed for PA sites across the network, based on analysis of revenue potential and return on investments.
- **(v)** Promote Biodiversity offsets and conservation banking to address unavoidable impacts.

- This assumes buffer communities will want to be involved.

- Preparation of strategies and guidelines to attract and regulate investments in PAs is one of the main outputs of this study.

### Strategy 5: Increase the number and type of investments across the PA System.

- **(i)** There is a diverse set of private investments and mechanisms generating funds for the PA system.
- **(ii)** PAs are operating revenue mechanisms that generate positive net revenues (greater than annual operating costs and over long-term payback initial investment cost).
- **(iii)** PAs enable local communities to generate revenues, resulting in reduced threats to the PAs.

### Strategy 6: Consolidate investments within the system and build capacity.

- **(i)** Within 5 years there is a significant increase in quality investments in PAs and buffer zones.
- **(ii)** Investments are contributing significantly to PA revenue generation scheme within 5 years.

- This increase should be easily discernible from the system level planning and budgeting mechanism promulgated by this study.
4.4.2 Sector Specific Strategies

The following strategies are given on the presumption that of all the sectors selected for this study only the tourism sector will be actively encouraged to invest in PAs. It is assumed that the other sectors will be more or less tolerated providing there are enough environmental safeguards to regulate the development. Notwithstanding this, there are real opportunities for PAs to generate income from these investments and for buffer communities to realize tangible benefits, while avoiding the degradation of landscapes and loss of biodiversity.

(i) Tourism Sector – Many Belizean PAs have well established tourism enterprises operating within the PA itself or their buffer region while others are keen to encourage this type of investment. Tourism is often seen as compatible with management objectives and the ideal revenue earner, unlike some of the other sectors addressed in this report.

The management of protected areas requires an understanding of not only the natural resource base, but also the characteristics of visitors and their needs. The contemplation of tourism would require that PA management adhere to the following steps.

a) Identification of exceptional resource values within the PA.

b) Identification of the PAs purpose and significance within the wider scheme of biodiversity conservation.

c) Identification of desired condition promulgated under the PA management objectives.

d) Development of a PA management zonation system and designated use areas.

e) Development of strategies for action and Implementation priorities.

f) Adherence to the National Tourism Management/Master Plan

g) Strategic Environmental Assessment (SEA) of the propose course of action for larger schemes.

h) Monitoring, feedback and reevaluation following implementation.

PA managers must be able to answer fundamental questions such as:

- What is the current impact of nature tourism on the protected area and local communities if any?
- Have issues been identified with the current level of use?
- Based on the above, what level of visitation can the PA accommodate without generating significant adverse impact?
- What measures can PA management take to secure community and stakeholder involvement? This is a major consideration since lack of community support often translates into conflict and sabotage as has been seen in a number of Belizean PAs.
The following strategies address the protection and enhancement of the environment, economic and social development and the promotion of satisfactory visitor experiences as follows:

**Assessment of current tourism situation and need**

1) Carry out an analysis of the existing capacity to accommodate visitation (overnight and day visitors) within the protected area and its buffer region or the demand and potential for visitation into the PA (this may not exist for some PAs).

2) Analyse existing or expected need for accessibility to tourist attractions including hiking trails. For offshore islands and remote mainland locations this is an important consideration.

3) Engage with PA managers on needs of tourism stakeholders and explore for mutually beneficial approaches.

4) Carry out a comprehensive assessment of tourist attractions and products.

5) Assess the marketing situation including marketing strategies and distribution and potential of integrating into national marketing initiatives e.g. by the Belize Tourism Board.

6) Assess the current situation and the impact of nature-based tourism on the protected area and establish the Limits of Acceptable Change. For offshore locations and sites near the international border this may also include security concerns.

**Assessment of supply and demand**

7) Assess main tourism trends and their probable implications for the PA.

8) Carry out a visitor demand survey within the PA and the buffer region.

9) Prepare a description of the requirements of different target groups to the tourism offer to gain an understanding of services that will be required.

10) Carry out a survey of the local population to understand what services they can offer and to assess their expectations from the propose tourism development.

11) Investigate examples of competing destinations and lessons learned at these sites. Look for examples of pitfalls, success, opportunities.

12) Consider value added and increase offering of services to promote employment opportunities for buffer communities and maximization of income potential for PAs.

13) Assess local demand for Belizean visitors to PA especially during off season months e.g. summer period.

**Interests of local stakeholders**

14) Conduct interviews with relevant tourism stakeholders/experts and hold workshop.
15) Evaluate findings from interviews and workshops and subject tourism offering to a SWOT analysis as a way of identifying the opportunities and risks for the individual PA.

16) Carry out an analysis of any existing development potential for tourism.

Mission statement and goals

17) Implement a working group meeting with the aim to develop the mission statement, guiding principles and objectives for tourism development.

18) Clearly formulate mission statement, guiding principles and objectives.

19) Implement a strategy workshop to discuss the mission statement with relevant stakeholders to ensure all are on board and for suggestions and feedback.

20) Present tourism development options and opportunities within the PA and buffer region along clear thematic lines for the medium to longer-term period.

21) Formulate the validated tourism development concept for the PA into a coherent strategy for subsequent action.

Projects / action plan

22) Plan and implement a project development workshops with the objective of achieving the following:
   a. Implement workshop for the development of proposals and list of actions.
   b. Identify networking opportunities and potential synergies within the larger tourism/PA structure. Assign responsibilities to competent individuals.
   c. Implement a follow-up workshop on the coordination of the action plan
   d. Rank prospective projects and document in a specific action plan.

23) Develop marketing strategies.
   a. Define target groups and marketing objectives,
   b. Development an inclusive marketing strategy including investment incentives.

24) Develop proposals for integrating the products into the existing distribution network of the region where possible.

25) Optimize external communications and marketing of tourism offers: define short and long-term marketing strategies to meet the marketing objectives.

26) Design structures and encourage cooperation between tourism providers in the protected area and its surrounding.

27) Incorporate the above into a tourism development concept report.

28) Address issues of insecurity, crime, pollution and potential user conflicts.

29) Emphasize need for land use plan including zonation in all PAs.

30) Increase institutional capacity within the Lead Agencies (Fisheries, Forestry and Archaeology Departments) to manage and regulate development in the sector.
(ii) **Forestry Sector** – The World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, recognized the vital role of the forest sector in achieving sustainable growth and the eradication of poverty:

“Sustainable forest management of both natural and planted forests and for timber and non-timber products is essential to achieving sustainable development and is a critical means to eradicate poverty, significantly reduce deforestation, halt the loss of forest biodiversity and land and resource degradation, and improve food security and access to safe drinking water and affordable energy”.

Progress within the forest sector requires striking a balance between production and conservation and the distribution of the benefits and responsibilities among the various local communities and stakeholders.

The economic attractiveness of forest activities including logging and harvesting of forest products creates an inherent difficulty in protecting forests that are in high demand for a range of often exclusive uses (e.g. Mahogany and Rosewood). Given the significant commercial value of forest it is natural that the private sector will be the principal financial actor in forest production within PAs.

The Strategy for the forest sector within PAs should rest on these important precepts:

a) Introduce land use planning at the field level.
b) Introduce a reliable system for determination of harvesting coupes.
c) Control unsustainable harvesting of non-timber forest products (NTFPs).
d) Promote sustainable participatory management of all forest resources.
e) Scale up and improve the performance of the wood industry by bringing it into alignment with sustainable timber supply and the processing of finished products.
f) Promote tree planting and care by assigning rights to the timber (establishing relevant owners), markets, and investment schemes.
g) Prevent encroachment, unauthorized activities and biodiversity degradation through solid law enforcement, capacity building and assist the participation of buffer communities in forest management.
h) Implement forest closure where there is evidence of ecosystem degradation, threat to biodiversity or in areas heavily logged beyond their sustainable supply capacity.

In implementing the above the following strategies are central to sustainable forest sector management in Belizean PAs:

**Monitoring of Land Use Changes**

1) Implement monitoring of land-use and forest cover change, including impacts of changes on biodiversity.
2) Establish permanent sample plots and introduce appropriate methods for regular monitoring.
3) Investigate and analyse underlying causes of land-use and forest cover changes.
Production Forest marketing and Management
4) Establish capacity within the Forest Department for marketing and management,
5) Carry out pilot stock surveys to determine the available timber resource on production forest. This is already an FD requirement but needs to be refined to make it more efficient and less expensive.
6) Based on the survey, document the forestry potential of the site for sustainable timber management.
7) Establish rules for the handling of (NTFP) plants and wildlife.
8) Engage companies interested in sustainable timber harvesting and management.
9) Assign forest concessions using a competitive bidding process.
10) Establish clear lines of communications and develop capacity for problem solving between PA managers and concessionaires.
11) Provide strong and clear incentives for investors who have long term concessions for land and biodiversity protection and sustainable production.
12) Encourage capacity building and environmental stewardship on the part of holders of forest concession licenses.

Production Forest Certification
13) Mount a pilot certification project to determine costs and benefits under existing forest management policies and conditions.
14) Apply for certification of Production Forests, which have long term management plans.
15) Provide adequate training to loggers and buffer communities in sustainable land use and forest resource management.

Buffer Communities Participation in Production Forest Management
16) Ensure active participation of buffer communities in Production Forest management through explanation of management schemes and tours to existing management sites.
17) Increase involvement of buffer communities with a view to deploying sustainable forest management techniques and methods into private and community lands especially in buffer areas.

Control of Logging Outside of Production Forests
18) Publicise location of approved logging sites and annual harvest volumes.
19) Establish regular monitoring of logging impacts outside Production Forests with buffer communities cooperation.

Integrated Production Forest Management
20) Identify and make available sound technical practices for managing the production forest. These may include, code of harvesting practices, forest planning, enrichment or replanting techniques, thinning, pest and insect control, downstream processing, selling, and marketing development.
21) Conduct pilot stock survey inventory within forest reserve in areas of highest potential.

22) Allocate adequate financial resources for managing the production forests.

23) Investigate international markets for additional income benefits such as biodiversity conservation of flagship or critically endangered species, carbon sequestration and payment for environmental services.

24) Increase processing and value added to promote increase employment in buffer communities.

25) Investigate and promote national markets for local environmental services provided by forests;

26) Investigate the use of forest waste for energy generation and landscaping among others.

27) Investigate options for participation in the Clean Development Mechanism and REDD+.

**Improve Harvesting and Marketing for NTFP Development**

28) Enhance the transparency and consistency of the harvesting plan.

29) Establish NTFP harvesting plans based on resource assessments rather than market demands.

30) Ensure harvesting levels are sustainable and scientific, and do not threaten the resource base.

31) Set higher royalties on products more susceptible to over-harvesting or that are known or thought to have threatened populations.

32) Promote NTFP processing and export through appropriate trade technical and financial support.

33) Educate communities on the sustainable use of wildlife and plants and other conservation matters in general.

**Capacity Building/ Institutional strengthening**

34) Provide or prescribe training to staff of timber concessionaires and Forest Department staff responsible for oversight.

35) Strengthen the capacity of buffer communities to develop sustainable forest resource management especially in regards to NTFPs.

36) Develop mechanism for the exchange of information and provision of technical assistance to communities.

37) Work with local groups, NGOs, and other partners to integrate forestry, agroforestry, and small enterprise activities in buffer region.

38) Increase the institutional capacity of the Forestry Department as the Lead Agency especially in the areas of monitoring and evaluation.

39) Provide adequate financial resources to the Forest Department for the implementation, monitoring and oversight of the national forest industry.
(iii) **Agriculture and Fisheries Sector**

**Agricultural Sector**

In Belize, agriculture is not considered to be compatible with PA management objectives under any management category due to its perceived negative impacts. This view has led PA managers to exclude agriculture and related productive activities from protected areas. On the other hand, Belizean farming communities around protected areas have often viewed measures to conserve biodiversity through land taking or land and/or water use restrictions as a threat to personal freedoms, livelihoods and the economic viability of their agricultural enterprises.

The exclusion of farming from PAs should not be taken for granted. The IUCN system recognizes that the maintenance of biodiversity in Categories V and VI is not always the primary reason for protection and that (management) choices may be determined by cultural values, environmental management, sustainable land use and recreational needs. In particular, these categories are suited for sustainable small-scale agriculture.

In Belize, with its relative abundance of land, there is little pressure for farming within PAs, however there is a golden opportunity to promote sustainable farming practices around PAs that are compatible with the management objectives of PAs. Appropriate farming methods can serve as vital corridor linkages between PAs as well as creating environments free of pollution. These areas can, through mix cropping increase botanical and structural variation increasing their capacity to serve as habitats for wild species while also effectively regulating populations of pests and disease causing organisms which affect crop productivity.

With this in mind the strategies promote sustainable practices outside PAs that are compatible with PA management objectives:

1. Reduce the use of inorganic fertilizers within PA buffer region which can negatively affect water quality.
2. Promote technologies including integrated soil fertility management, adapted varieties, crop rotations, conservation tillage, buffer strips, and organic farming.
3. Reduce pesticide use which indiscriminately kills many valuable species and focus on biological control methods.
4. Diversify agro-ecosystems to protect food systems, improve diets, minimize risks, diversify incomes, and conserve agro-biodiversity.
5. Vigorously promote agroforestry as a viable alternative to traditional monoculture crops within buffer community areas.
6. Rehabilitate productivity and ecosystem functions of degraded lands especially pastures to enhance environmental roles such as the protection of environmental services, soils and the sequestration of carbon.
7. Promote legislation that will allow payment for ecosystem services to farmers using sustainable land use in important watersheds.
8. Promote development of regional, national and international markets for sustainable agricultural products produced by buffer communities.

9. Promote the use of buffer strips between fields which can act as biological corridor for wildlife.

10. Strengthen local community institutions in land and water resource management. This includes the control of soil erosion and the stabilization of slopes in hilly terrain.

11. Consider the use of land-use certificates to buffer zone families who adopt compatible practices that respect and promote the management objectives of PAs in terms of land use and the management of natural resources.

12. Improve the demarcation of PA boundaries and agitate for agricultural exclusion from areas near to the PA boundary or restrict agricultural development solely to agroforestry schemes.

13. Ensure EIA is carried out for agricultural enterprises that meet or exceed DoE established thresholds for agricultural holdings.

**Fisheries Sector**

This is one of the most important sectors in the Belizean Economy bringing both income for communities and providing a valuable food source. Terrestrial and marine PAs contain some of the country’s best fisheries resource and therefore generate a lot of interest within the fishing industry. Fortunately some forms of fishing can occur within PAs without necessarily threatening the conservation objectives of the area as long as they are regulated and do not involve habitat modification.

The following strategies can help to put the industry on a firmer more sustainable footing.

1. Move away from conventional, target-resource oriented management and consider a more integrated, area-based management in which Marine Protected Areas (MPAs) are seen as an important tool which embraces ecosystem conservation.

2. Focus on incorporating species interactions such as competition and predation, conservation of habitat, and protecting critical life history stages of species and other ecosystem considerations into fishery management.

3. Aim to achieve optimal sustainable utilization of fishery resources, focusing on limiting fish catch to sustainable levels, while also taking broader ecosystem considerations into account.

4. Adopt a precautionary approach to the management of marine resources which promote the use of best available tools and practices according to defined objectives and case-specific circumstances.

5. Change the objectives of fisheries management from maximizing annual catches and employment to sustaining stocks and ecosystems, and from maximizing short-term interests to addressing both short- and long-term interests.
6. Develop different management strategies through zoning and creation of a network of smaller management areas. Strictly protected, no-take reserves lie at one end of the spectrum; zoned, multiple use areas lies at the other end, with various combinations and options in between.

7. Only allow traditional extractive fishing within non-extractive protected areas if the users are willing to develop and implement a sound sustainable use plan and work under monitored sustainable use agreements.

8. Fisheries managers should consider the application of area closures to support the management of fisheries resource, or as a restoration tool for a fishery that has been over-exploited. This approach can be used as a tool to address over exploitation of all fish species or a single species or for restriction of fishing methods.

9. Consider the closing of multiple use MPAs to conserve biodiversity where these have been shown to be underperforming.

10. Make provisions for stock assessment expertise to ensure that fisheries management agencies are fully involved and committed to the process to prevent conflicts during its application.

11. Management should be responsive and adaptive, working with local interests in a way that builds support for the achievement of the conservation objectives. To achieve this, managers should adopt a systems approach, use interdisciplinary teams and follow a clear and logical sequence of decision making.

12. Belize’s MPA managers should push to develop more environmentally friendly fishing methods and offer incentives (including financial) for fisher folks to abandon certain destructive types of fishing gear.

13. Carry out an exercise in the valuation of local fish products which properly reflect the management cost to the PAs.

14. Ensure the participation of local fisher folk in consultation with developers from the onset of any investment in this sector.

15. Integrate all actors (including the merchants and other fisheries stakeholders) involved in the fishing industry into the stakeholder consultation process to assist in fisheries management.

16. Clearly define MPA boundaries and clarify rules governing resource use within reserves to foster compliance and simplify enforcement.

17. Increase the fines charged for illegal fishing and improve the capacity for Belizean PA managers to build the case for prosecution of environmental offenses.

18. Implement adaptive re-zoning into the management process as a key requirement for successful management of multiple-use MPAs which allow fishing.

19. Periodically re-assess the goals and objectives and to inform and adapt the process to it. This is important since some of the management goals of an MPA will shift over time.
20. Implement training for the judiciary and mount strong awareness campaigns in the media to increase public education and awareness about environmental offenses in this industry.

21. Implement monitoring as a crucial tool to determine the success (or lack thereof) of the MPA in fisheries resource conservation.

22. Carry out accurate and regular monitoring of key fishery indicators (bio-physical, socio-economic and fisheries) as an essential tool to demonstrate causal relationships between sanctuaries and fisheries.

23. Create goals for the scope and purpose of MPAs which reflect a balance between the scientific, social and economic needs and realities of fishermen and the fishing industry of Belize.

24. Carry out communication about the purpose and intent of any new MPAs in a clear and transparent manner early in the process so that any misperceptions on the part of the fishing industry can be addressed.

25. Ensure that fishermen, individually and as a part of their cooperative, are made a part of the decision-making process of the MPA. Without this, it will be difficult to obtain their support and compliance.

26. Educate fishermen so that they will come to see that the benefits to be obtained from participation in the MPA, including compliance with rules, will be greater than for non-compliance.

27. Create rules that allocate resource use benefits to users in rough proportion to the costs that these users incur. This will be perceived as a more legitimate approach, and thus enjoy greater compliance, than rules that allocate benefits disproportionate to their costs.

28. Enlist stakeholders, including resource users, in data collection and analysis to educate participants, build capacity and foster trust in the MPA and its management.

Strategies for managing an MPA that combines objectives of both fisheries management and biodiversity conservation are varied and include the following among others:

29. Demarcate use zones according to use patterns and the objectives of management.

30. Regulate and control fishing gear inside and adjacent to MPAs in relation to the use zones as determined in the management plan.

31. Place permanent mooring buoys to prevent bottom habitat damage, especially in coral reef and other fragile environments;

32. Consider various approaches to enforcement inside and outside MPAs such as:
   o Development of support for protection work among fishermen stakeholders;
   o Enforcement through peer group pressure and local incentives and disincentives;
o Use of regular police, tourism police and the maritime wing as enforcement channels depending on their availability and ability to assist;

o On-going education programs to inform stakeholders of illegal activities in conjunction with use of effective but appropriate penalties with law enforcement backing;

o Increase the enforcement and monitoring capacity of the Fisheries Department as the Lead Agency (Cost to be carried through increase fee collection for monitoring).

o Increase use of SEA and EIA to vet development proposals within the sector.

(iv) Water Resource Sector

Belize can be considered a “water rich country” in which most citizens take abundant clean water for granted. Belize’s PAs play a vital, if sometimes unappreciated role in regulating and conserving water resources. National economic planners and policy-makers have been slow to appreciate this contribution and as a result, PAs have been the “silent partners” subsidizing the cost of a quality and essential product for national development.

Most of Belize’s PAs are located in the upper catchments of the country’s various river basins, the most significant being the Belize River and its many tributaries. These regions of relatively high rainfall maintain crucial watersheds and their forest cover help to ensure good quantity and quality of accessible water throughout the country for important productive sectors such as agriculture and energy.

Currently the PAs earn very little revenue from the beneficiaries of the water resource sector for their role in safeguarding and enhancing watershed functions with the expenditure borne from the public purse. The current water pricing system does not account for the contribution of PAs’ watershed services. The following strategies are proposed to improve the current system and make it more accountable and responsive to the needs of the PAs.

1. Carry out a valuation of PAs contribution to water quality and quantity within the country. It is hoped that as the functions become better understood by the sectors which benefit, economic planners can begin to reflect those values in plans and budgets so that adequate investments go to their effective management.

2. Identify priorities for action in terms of rehabilitation and maintenance of existing protected areas to safeguard their water management functions.

3. Identify locations where protected areas boundaries are in need of alignment to provide a better regime for the protection of water resources and natural hydrological functions which may be at risk.

4. Identify the regimes of protection needed outside and linking protected areas to better safeguard hydrological functions and the priority locations where actions are needed;
5. Protected areas value in safeguarding hydro-physical processes need to enter into national economic planning.
6. Promote water quality monitoring in locations where it is under heavy use by the productive sector.
7. Monitor impacts of the agricultural sector on the nation’s water resources.
8. Pilot the user pays approach in specified protected area clusters.

(v) Energy Generation Sector

Belizean protected areas are the centrepiece of hydroelectric power generation in the country and have significant potential for the production of other forms of renewable energy. The use of these PAs to generate energy has raised the question of whether the long-term benefits of biodiversity conservation are compatible with energy exploitation. For those projects that are given the green light it is clear that the negative effects must be balanced against the benefits provided by biodiversity conservation.

Experience from existing hydropower facilities show that these projects are associated with forest lost, ecosystem degradation, illegal encroachment due to the building of access roads, watershed erosion and sedimentation, decrease in downstream water quality, threats to aquatic and terrestrial wildlife and barriers to wildlife movement due to the creation of dams and transmission lines.

Worldwide, the trend is to require commercial operators in the energy sector to pay for protection of critical ecosystem services and products which they use. More importantly is the presumption that part of the payment should go back to safeguarding the natural resources and systems on which the industry depend. In Belize, there is no mechanism for the energy sector and energy beneficiaries to pay for the services that PAs provide.

The following strategies are meant to address these apparent shortcomings and guide the behaviour of this sector within PAs and their buffer areas.

1. Conduct SEA studies to inform early decision making in regards to potential impacts of scheme.
2. Undertake initial biodiversity studies and environmental impact assessments (EIA) prior to making any decisions on energy projects.
3. Strengthen the EIA requirements for this sector.
4. Carry out a thorough biodiversity and environmental study within the affected PA before any activities relating to the development project can proceed.
5. Ensure that no energy proposal proceeds if the initial biodiversity and environmental study show significant and irreversible negative effects on the biodiversity of the protected area.
6. Involve affected stakeholders in the initial biodiversity studies and environmental assessment.
7. Introduce conservation levies and payment for environmental services (PES) on all energy developments as called for in the PACT Strategic Plan 2011 to 2016. The charges and levies will ensure that all forms of energy development pay for maintaining and protecting the ecosystem benefits they receive.

8. Develop sub-watershed conservation schemes since solutions are more easily tailored to suit the specific requirements of diverse sites. Site specific approaches facilitate protection responses and community participation and the ability to capitalize on indigenous technical knowledge.

9. Undertake exploratory and development work on the basis of detailed mitigation and protection measures stipulated in the environmental studies provided no significant biodiversity or environmental impacts were foreseen to affect the protected area as a result of the energy project.

10. Ensure energy project proceed in parallel with a long-term biodiversity maintenance and enhancement program designed for implementation as part of the overall management of the protected area.

11. Pilot the user pays approach for environmental services to the energy industries based on the services derived from PAs. This should include a legal framework for putting the user pays principle into effect for each hydropower scheme including provisions for:
   a. An upfront payment (as a percent of capital cost of the scheme) to cover the cost of initial biodiversity studies and environmental assessments including a training component;
   b. On-going annual fee (set as a percentage of the revenue from electricity sales) to go to the overall management of the protected area, associated capacity building, and maintenance of the services provided to the scheme;
   c. Ensure that developers pay sufficient fees to cover monitoring and oversight for energy projects.
   d. The establishment of a protected area trust fund (to cover the specific protected area or associated cluster of protected areas) for the management of the funds in accordance with the overall management plan for the area.

(vi) Oil and Mineral Sector

Oil Sector

The oil and gas industry has been operating in some of the world's most sensitive environments for more than 100 years. Over time the industry has developed new technologies and control systems to make the sector more environmentally and socially responsible. Oil companies have been able to implement environmental management systems and expand the use of social and environmental assessments to better regulate and account for their activities.
The incipient Belizean petroleum industry will likewise need to evolve its operations and build proper environmental controls to instill confidence in the public. To that end and based on the consultations, the following strategies are forwarded to guide developments of the oil sector within PAs and their buffer zones.

1. Oil companies along with PA managers and the relevant regulatory agencies should develop a code and manual to govern their activities within PAs.
2. Oil companies should train competent staff to monitor the impact of oil and gas activities on the environment and biodiversity.
3. Environmental regulations and standards relevant to the oil and gas sector in Belize should be developed and approved.
4. Oil companies and PA managers should develop rules for compensation for environmental damage to PAs which will properly and fairly reflect the extra cost of monitoring resulting from their activities including fair payment for monitoring work.
5. Oil companies, PA managers, regulatory agencies and relevant stakeholders should develop appropriate policies in respect to the use of biodiversity off-sets and other instruments to compensate for biodiversity loss and present to the government for approval.
6. Assess projects on a case by case basis taking into consideration local environmental factors and appropriate management practices. Activities would only be excluded from areas where compatibility with the management objectives for an area cannot be demonstrated or established objectively.
7. Implement SEA to ensure that oil and gas activities in sensitive coastal and offshore areas are undertaken in a manner that conserves the environment and biodiversity and provide guidance to further decision making processes.
8. Review management plans for protected areas and update to take the oil and gas sector into consideration.
9. Ensure environmental impact assessments for oil exploration and development projects within PAs are of a high standard before project implementation.
10. Assessments should include environmental, economic and social costs and benefits to inform decisions and should take account of compatibility with existing land uses and commercial activities.
11. Make more frequent use of public consultation through surveys, public meetings, community advisory committees and publicly available reports of environmental performance. This should be apart from regularly mandated public consultations.
12. Require stringent environmental controls within strict biodiversity management zones in PAs.
13. Lobby for oil exploration and production activities falling within buffer zones of PAs are subject to some environmental controls.
14. Ensure oil exploration activities are closely monitored to enable compliance with mitigation measures and their effectiveness.

15. Require that comprehensive oil spill contingency planning is developed for each project in order to provide guidance on oil spill responses and actions including a risk analysis of the oil and gas activities and stakeholder sensitization.

16. Return all operational sites to their original condition as an environmental obligation and clean up any environmental pollution at Oil Company’s expense.

17. Take into consideration natural environmental processes and fluctuations, both temporal and spatial that will place industry impacts into an appropriate context in regards to ecosystem resistance and resilience to change.

18. Evaluate and where warranted, increase the institutional capacity of the Geology Department to regulate and oversee development within this sector.

**Mining Sector**

Mining can cause significant adverse environmental and social impacts, including permanent ones, however like the petroleum industry; environmental practices have improved over time. In the last half of the twentieth century, new technologies and practices have developed to address these impacts and make mining as an industry more accountable to the public. Notwithstanding this, some types of exploration and mining development may be incompatible with the objectives for which some PAs are designated, even after all technically and economically feasible steps to reduce adverse impacts have been considered.

Mining in Belize has raised some serious environmental concerns centered on impacts from water quality, access, landscape and deforestation. This in turn has provoked the question as to whether mining is compatible with PA management objectives generally. The following strategies are proposed to address these concerns:

1. Strongly regulate all exploration and extraction of mineral resources within Belizean PAs corresponding to IUCN Protected Areas Management Categories I to IV with a presumption towards prohibiting or stringently regulating mining in those areas.

2. Mining taking place in categories V and VI PAs involving exploration and localised extraction would be accepted only where the mining project demonstrates compatibility with the objectives of the PA and is accompanied by a quality management plan,

3. Subject all mining applications in PAs to requirements of SEA.

4. Lobby to make it mandatory for all application for exploration and production mining within PAs be accompanied by an Environmental Impact Assessment (EIA) or Limited Level Environmental Study (LLES) depending on the scale of the project and the sensitivity of the receiving environment.
5. Support the adoption of best available techniques in the mining sector and the transfer of skills and technology throughout the industry.

6. Work with government departments and conservation NGOs to develop transparent, inclusive, informed and equitable decision-making processes and assessment tools that better integrate biodiversity conservation, protected areas and mining into land-use planning and management strategies.

7. Support projects which use proven technologies to address legacy mining waste and contribute to full remediation and rehabilitation of mining sites upon mine closure to a standard acceptable to the PA management and the DoE.

8. Carry out mineral assessment for any newly proposed PA and incorporate into Management Plans to take the mineral sector into consideration from the onset.

9. Implement SEA to ensure that projects in the mining sector are undertaken in a responsible informed manner that provide guidance to further decision making processes.

10. Require that site restoration and re-landscaping proceed on a continuous basis as operations are completed in quarry sections to minimise long-term impacts.

11. Initiate standards for efficiency in the use of resources including water efficiency and waste minimisation.

12. Ensure that adequate facilities are in place for the treatment of produce water generated via mining activity so that it does not contaminate surface or groundwater.

13. Perform adequate baseline studies to identify the quantity and quality of water resources in the area.

14. Minimise water use to the extent possible, and then maximise options for recycling and reuse of water.

15. Ensure that the design, construction and maintenance of waste rock facilities and tailings facilities promote safe operation and do not pose significant risks to human health or the environment.

16. Address impacts and mitigation within the project’s Area of Influence as well as the mining site. The Area of Influence can include linear assets such as power lines and access roads as well as quarries and processing plants. Communities affected by mining can also be included in the projects Area of Influence especially those which lie downstream.

17. Stakeholders should be engage at every stage of the EIA process to ensure that the concerns and perceptions of key stakeholders, including local communities, indigenous peoples, local CBOs and local authorities are taken on board and duly considered.

18. Ensure that the mine developer and all third parties including contractors have the capacity and commitment to address all impacts and issues arising from the project including capacity for disaster management and monitoring.
19. Ensure that authorized exploration and mining projects be subjected to strict planning, operating, monitoring and post-use restoration conditions. Ensure that monitoring standards meet applicable international criteria including USEPA and WHO.

20. Ensure that any propose changes to the boundaries of protected areas, or to their re-categorization, is not predicated on the need to allow for the exploration or extraction of mineral resources.

21. Lobby for mining developments within PA buffer areas to be subjected to EIA if they entail exploration and extraction of mineral resources which may affect the values for which the PA was established.

22. Ensure that project proponents hire qualified staff to perform the technical duties, and in the case of biodiversity offsets, this will require specialist technical input.

4.4.3 Criteria for Success

Investments in PAs are attractive only if they can be shown to generate development benefits. For PA systems to remain financially viable and meet their biodiversity protection mandate they must demonstrate the ability to capture economic benefits and translate them into financial flows. The private sector must be induced to see the advantage of investing in PAs and natural resource conservation generally. The following observations will apply to Belizean PAs vis a vis private sector investments and public sector support.

1. It is relatively easy to convert economic benefits to financial returns where markets for PA goods or services either exist or can be created e.g. fish products or timber. In these cases investors are easy to come by and the main danger is from over exploitation.

2. Private investors will generally invest in PAs only if they see that their investments will generate some kind of financial return. When these returns do not match expectations, investors will not invest.

3. The recent demand for green (ethically produced) products offers a golden opportunity for investments in Belizean PAs, however this opportunity is being overlooked and illegal entities have stepped into the void creating management problems for the PAs.

4. It will not always be possible to realise a financial return from the goods and services provided by PAs. The most difficult development benefits to capture are those described as non-marketed “public goods”. The provision of public goods should be supported through budgetary allocations by government or cost-sharing mechanisms to ensure that they are available to the community.

5. Some Belizean PAs will always require a certain level of public financial support. This is justifiable given that PAs produce many public goods that are enjoyed by the entire Belizean population. Even if Belizean PAs could be financially self-sustainable
some level of government support is still desirable as PAs will always need government engaged for policy and regulatory support.

6. Conservation targets must be balanced with adequate protection of the outputs that are needed to generate sufficient revenue for PA management. Commercial incentives should not dominate management decisions, to the detriment of other ecological and environmental attributes needed to maintain ecosystem integrity.

7. Conservation objectives must not be compromised by commercial pressures in cases where private interests compete with environmental protection. Commercial pressures can result in poorly controlled development and cause significant damage to natural systems within PAs.

8. Belizean PA managers will need to be more proactive and open minded towards inward investments if further deterioration of the natural resource base is to be prevented due to under investments,

9. PA conservation and funding initiatives must be complemented by voluntary conservation efforts on the part of land-owners adjacent to PAs, designed to protect natural habitat in exchange for concessions on land taxes, markets for green products and other incentives.

4.4.4 Risk Factors

Any investment within protected areas will carry a certain amount of risks some of which are specific to the prevailing economic and political situation in the country while others are more localized and site specific. It is very important that risks are taken into account when considering investors for investment in PAs and the buffer zone region. Proper vetting of potential investors will spot areas of conflict at an early stage so that remedial action can be taken. For investors, the risk premium should be sufficiently high to compensate for the average risks that are faced when investing in the PA or buffer zone region. Table 4.2 below summarizes the common risk normally associated with projects in the six identified productive sectors.

Table 4.2: Project risk carried by the PA and Developer.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Risk to the PA</th>
<th>Risk to the investor</th>
</tr>
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<tbody>
<tr>
<td>Crime and insecurity</td>
<td>-</td>
<td>- Potential clients are reluctant to patronize business</td>
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<tr>
<td></td>
<td></td>
<td>- Extra cost on management</td>
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<tr>
<td>Land use conflicts</td>
<td>-</td>
<td>- Unknown land ownership or claim arises</td>
</tr>
<tr>
<td>Political risk</td>
<td>- PA fails to garner political or community support for investment project</td>
<td>- New administration changes the rules governing PA/investor relationship</td>
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<tr>
<td></td>
<td></td>
<td>- Corruption and nepotism</td>
</tr>
<tr>
<td>Risk Type</td>
<td>Issues</td>
<td>Consequences</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Reputational Risk</td>
<td>- PA loses credibility about its commitment to environmental principles</td>
<td>- Delays in receiving permits</td>
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<tr>
<td></td>
<td>- Company gets a bad name and incurs damage to its brand. Withdraws investment as a result</td>
<td></td>
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<tr>
<td>Unrealized revenue projections</td>
<td>- The PA fails to acquire anticipated revenue from investment</td>
<td>- Revenue projection unrealistic</td>
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<tr>
<td></td>
<td>- Investor confidence recedes and closes operation</td>
<td>- Financing not sufficient to cover establishment cost before actual income</td>
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<td></td>
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<tr>
<td>Disease and natural disasters</td>
<td>- The PA loses critical aspects of its natural assets making a harder sell to investors</td>
<td>- Unanticipated losses of marketed resources</td>
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<td></td>
<td></td>
<td>- Project no longer viable</td>
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<td></td>
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<tr>
<td>Pollution from spills and emissions</td>
<td>- Damage to PA ecosystem</td>
<td>- Reputational damage</td>
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<tr>
<td></td>
<td>- Wider ecosystem damage outside PA and residual effects</td>
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<tr>
<td></td>
<td>- Cleanup Cost</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Conflicts and disputes between the parties</td>
<td>- Costly legal proceedings</td>
<td>- Costly legal proceedings</td>
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<tr>
<td></td>
<td>- Reputational damage</td>
<td>- Reputational damage</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Deteriorating national macroeconomic indicators</td>
<td>- Difficulty in recruiting investors</td>
<td>- Difficulty in raising capital</td>
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<tr>
<td></td>
<td>- PA Management compromises principles to attract investor</td>
<td>- Devaluation of currency</td>
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<td></td>
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<tr>
<td>Deteriorating environmental values</td>
<td>- Cleanup after project abandonment</td>
<td>- Loss of business clients and revenue</td>
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<tr>
<td></td>
<td>- Ability to attract new investments compromised</td>
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<td></td>
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<tr>
<td>Stakeholder opposition</td>
<td>- Stakeholders fail to derive benefits from project</td>
<td>- Stakeholder opposition leads to confrontation and sabotage</td>
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<td></td>
<td>- Alienation of stakeholder support</td>
<td></td>
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</tbody>
</table>

### 4.5 The Process of Promoting Private Investment in PAs

The processes outlined in this section cover aspects of developing, implementing, managing and concluding an engagement with the private sector. They aim to ensure that engagements align with the PA’s management philosophy and the Sector Investment Strategy. Above all the process should be straightforward and transparent and takes full account of risk and be properly vetted and documented at each level. The overall process can be summarized in the flow chart as follows (See Figure 4.1):
Figure 4.1: Flow chart showing the investment process.

The main steps are:

1. **Establish or adopt rules and guidelines that will define the relationship between the PA and the investor.** This is the first step and is the most crucial since it will set the tone for the relationship that will eventually develop between the investor and the PA.

2. **Select a business partner(s) based on the rules and guidelines.** In many cases this will not be up to the PA since some forms of investments are sanctioned by the government under its rights and prerogatives and under the principle of eminent domain.

3. **Negotiate and formalize the agreement.** This is the time when the PA managers can work to ensure that the investment has taken all risk into account and that the investor is aware of his obligation including those of biodiversity protection. The end product of this step is normally a formal contract agreement.

4. **Implement and manage the agreement.** This may include the need for monitoring and due diligence.

The steps outlined here provide an overview of the necessary practices and procedures. Protected areas managers should eventually develop a template which could become standardized throughout the Belize PA System. The processes involved in selecting a
business partner and formalizing an engagement are highly iterative: the engagement concept, business selection, project concept, negotiation, risk assessment and management, and drafting of a contractual document inform each other. This means that each step inform subsequent steps, however it may become necessary to go back and refine the project concept as negotiations proceed with the developer.

Companies and investments are not static and in a dynamic business environment, plans can change or be modified. Businesses by their very nature try to maximize profits which often mean pushing environmental limits. Where these changes become unacceptable to the PA it may become untenable to proceed and an alternative business partner may have to be chosen. **Table 4.3** shows key tasks, outputs and assumptions.

**Table 4.3**: Summary of key tasks, outputs and assumptions.

<table>
<thead>
<tr>
<th>Key Tasks</th>
<th>Outputs</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Engagement Concept: Which sector will be best from the conservation perspective and other priorities of the PA?</td>
<td>An engagement concept for the Component Program.</td>
<td>Investors preferred by PA managers will have an interest in investing at the site.</td>
</tr>
<tr>
<td>2. The Selection Process: Decide on which business enterprise to work with based on (1) above.</td>
<td>Business partners selected.</td>
<td>The PA manager has the final say in choosing investors. In some cases eg mining this is not the case.</td>
</tr>
<tr>
<td>3. Engagement plan and contractual document: Draw up contractual document including rules, guidelines and principles that Investor will have to follow for duration of the engagement.</td>
<td>Signed contractual document including a detailed project concept for the business.</td>
<td>The investor(s) will agree to the conditions laid down by the PA management. This may not be the case if the Investor has choices among a number of PAs.</td>
</tr>
<tr>
<td>4. Implementation – The PA manager and the investor will need to agree the steps to project implementation, with adequate provisions made for oversight, resolution of conflicts and arbitration.</td>
<td>A plan of action and timetable are drawn up.</td>
<td>Things will go smoothly in a sequential fashion. Again dealing with public, private and community entities could cause unforeseen delays and complications. In addition stakeholders may not agree with the views of the PA managers.</td>
</tr>
<tr>
<td>5. Due diligence and verification of commitments</td>
<td>Final engagement report Progress Report Evaluation report (if applicable) Audit (monitoring) report</td>
<td>The investor will provide funding for this. If not, this could pose a burden on the financial and human resources of the PA.</td>
</tr>
</tbody>
</table>
4.5.1 Making the Right Connection

This is a crucial step since it involves strategic thinking about where the protected area wants to go in the future and what alliances and associations it wants to make with stakeholders including the business community. This will set the tone for future investments but the PA must be accountable to its supporters, stakeholders, the conservation community and its other sources of funding – some of whom may decide to withdraw their funding if the principles underlying the investment seem to violate the ideals of the PA.

The PA must strategically assess its own expectations and those of the investors as well as the desired results and requirements with respect to the engagement. The gravity of this decision indicates decision making at the highest level of the organization. This strategic thinking could be captured in a document detailing the engagement concept.

Actions required falls under the following two headings:

1. Develop an engagement concept which includes:
   a. Clear results expected from engaging the private sector, linked to the PAs charter, Articles of association, IUCN management Category and the Objectives of the Management Plan,
   b. Expected results of engagement with private sector investor,
   c. Identification of which sectors will be targeted with justification for the selection made,
   d. Elaboration of what the PA brings to the table with reference to management effectiveness, values, natural attractions and resources,
   e. Decide and agree on what a private sector entity would gain from the engagement,
   f. What is needed to make the engagement successful (funds, capacity, etc),
   g. What kind of activities are envisioned (joint projects, sponsorships, licensing),
   h. How they will be delivered.

2. Ensure that the concept:
   a. Does not undermine or conflict with other PA program areas, strategy or plans,
   b. Draws on the interests, experiences, resources and capacity of the PA’s physical, scientific and human strengths.

3. Validate the engagement concept with the PA management and the Board of Directors or otherwise the highest governing body of the PA.

4.5.2 Selection of Investment Partners

Potential investment partners must be properly vetted by the management of the PA. This is the point where a thorough risk assessment is required. It can be delivered through the vehicle of a due diligence study of the propose investment partner. At this point a strategy
must be devised to manage risk on an ongoing and evolving basis. These should be live documents, constantly evolving over time as situation and circumstances change.

Potential investment partners should be assessed on their potential to contribute to the financial performance of the PA as well as their ability to contribute to other management objectives of the PA. The compatibility of the propose investor activity with the management aims of the PA should be paramount. Any selection must be approved at the PAs top management level and through any existing co-management structure etc. This includes the assessment of the potential business partner, any due diligence study performed and the risk management strategy. Any selection must have full legal advice and be made on an approved legal basis.

Specific actions required include the following:

1. Assess and select potential private sector investor according to:
   a. The extent of their expected contribution to the PA management programs and financial sustainability of the PA,
   b. Ability of the investment partner to deliver on promises and commitments including the engagement concept,
   c. The commonality of the investor objectives with those of the PA Management Component Programs,
   d. The potential of the investor to replicate successes/lessons learned/experiences within and across the business sector,
   e. The willingness and ability on the part of the investor to promote the establishment of industry-wide standards, best practices and benchmarks,

2. Perform a due diligence study to identify possible sources of risk and prepare a risk management strategy.

4.5.3 Negotiate the Agreement

In this stage the partners will negotiate for a shared vision and commonality in approach. This will involve exploring with a selected business the mutual benefits in working together and negotiating a contractual relationship. Following the initial contact and in consultation with relevant stakeholders, a project concept must be developed and validated by the PA management.

Negotiations should focus on establishing a mutual understanding of expectations on both sides, clarification of what can and cannot be done through the engagement, and a clear path ahead including a time frame and deliverables. A follow-up due diligence must be performed if any areas requiring further investigation were identified during the due diligence, and the risk management strategy updated. The draft contractual document must be signed off by the PA Management Authority and Board of Directors or the co-management partners. Ideally after signing, details of the engagement should be made available to the core stakeholders of the PA.
Specific actions required under this heading include:

1. Based on informal consultations with the private sector entity and relevant stakeholders, develop a project concept which includes the following components:
   a. Define the overall purpose and the specific objectives of the engagement, matched to the management objectives to the PA and the nature of the business,
   b. Indicate how these objectives could be achieved,
   c. Show how other PA program areas, stakeholders, buffer communities etc could benefit or become involved with the proposed investment or how the project would complement those areas.
   d. Outline opportunities to strengthen PA management capacity in existing areas and develop new capacity
   e. Indicate the financial viability of the engagement and projected financial benefit going forward,
2. Submit the project concept for approval.
3. Communicate with core stakeholders that negotiations with the private sector entity are underway, giving the nature of the propose enterprise, expected benefits and due diligence summary.
4. If further investigation is warranted, complete a follow-up due diligence and update the risk management strategy accordingly.
5. Formalize the agreement with the private sector using an appropriate mechanism (Memorandum of Understanding, Memorandum of Cooperation, Contract, Agreement, Terms of Reference, etc).

The contractual document must:

(i) Include specific, time-limited, and achievable results and outputs;
(ii) Define roles and responsibilities for realizing the results;
(iii) Define capacity and resource requirements on both sides;
(iv) Define indicators for monitoring and measuring performance, progress, and results;
(v) Define a process to address breach of contract (including non-delivery of agreed outputs);
(vi) Include a termination clause;
(vii) Define a mechanism for raising and addressing grievances from third parties;

Communication of the agreement and signoff on the agreement:

- Circulate relevant documents to key personnel. This will include key elements of the proposed engagement, the due diligence summary, risk and risk management strategy and requirements for resources from the PA,
- Recommendations for decisions and actions,
- Communicate the agreement publicly, and make available a summary of the signed contractual document.
5 Guidelines for Investments in PAs and their Buffer Zones

While we consider the potential investment interests as appropriate for socio-economic development of the communities and the nation, the challenge is how to achieve responsible development with conservation in order to create a balance in which business and nature complement each other on a mutually beneficial and sustainable basis.

It is impossible to say with certainty that any particular project within any of the sectors under discussion will bring any real benefit or harm to the PA or buffer areas. For any particular investment the benefits must be weighed against the potential for harm. Any investment proposal needs to be considered on a case by case basis using the tools below. Properly applied, the tools can help to improves good projects while screening out projects where the outcome and benefits is likely to be dubious.

Even pariah project such as mining if properly planned and executed can reduce impacts to an acceptable level while bringing real financial benefits to the PA and the local and national economy. Long term investments should be preferred over those that focus only on the short term. Investors should be encouraged to invest in maintaining the long term biodiversity integrity of the area through good husbandry and careful stewardship of resources.

Some investments in commodities such as metals are subject to volatility in pricing on the international markets, while investments in areas such as tourism are subject to downturns within the international economy. Such investments may not be sustainable in an unfavorable economic climate leaving the PAs with reduced income and possible environmental damage if the enterprise fails completely and the PA is left to handle things such as pollution damage on their own. In an era of rapidly increasing demand for products and services it is hard to predict such occurrences, however PAs should have contingencies in place in case they do occur.

a) Users:

The Principal users of the assessment guidelines will be prospective investors in PAs who will benefit from an enhanced selection and approval process and technical advice for projects that are economically and environmentally viable. The guidelines will provide public sector employees and managers, with a streamlined approach to selection/permitting, monitoring and evaluation of well planned investment ventures.
b) Underlying principle:
The guidelines are rooted in environmental best practices, existing policies, regulations and institutional arrangements. They strongly focus on accepted science-based criteria for evaluation, transparent and participatory process that addresses the needs and concerns of the public and the investors. To that end a review was undertaken of existing regulations policies and guidelines which currently govern and regulate development and promulgate environmental stewardship in Belize.

5.1 The EIA Process in Belize
The Environmental Impact Assessment (EIA) process is one of the most powerful tool for vetting potential projects within PAs and their buffer zone since it looks closely at the environmental and social implications of a scheme on the existing environment. EIA is a tool for decision-makers to identify potential environmental impacts of proposed projects, to evaluate alternative approaches, and to design and incorporate appropriate prevention, mitigation, management and monitoring measures. The assessment of social impacts has now become an integral part of the EIA process and one of its key dimensions.

EIA helps to identify important natural habitats, functions and processes and seeks to ensure their protection, maintenance and rehabilitation where appropriate. Depending on the context in which it is applied, EIA can be quite complex, especially in the context of broad policies and large sector programs. All important (major) projects need to undergo the screening process to determine their potential impacts and hence eligibility for EIA.

The EIA process in Belize is well established and has now reached a certain level of maturity in the processes and practices involved. Legislation introduced since the mid-1990s have helped to put environmental management of projects on a firmer footing. The system for the most part appears to function well and provides a valuable service to the public in vetting projects, in preventing undue environmental harm and in safeguarding the interest of the larger society.

The DoE’s primary role in the initial stage is to appraise projects in terms of their potential environmental risk which will in turn depend on factors such as project size, type and location. Projects which may pose a significant risk to the environment may be required to carry out a full EIA, while projects with smaller magnitudes of risk may be required to submit a Limited Level Environmental Study (LLES) or be entirely exempted from the process. Table 5.1 Below summarizes main elements of the EIA process in Belize.

Table 5.1: Key stages in the EIA process.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Preparation</td>
<td>The developer prepares the proposals for the project</td>
</tr>
<tr>
<td>Notification to</td>
<td>The developer informs the DoE as the Competent Authority about the</td>
</tr>
</tbody>
</table>
### Competent Authority

Development proposal in advance of the application for development consent. This is a legal requirement and should precede development of any project falling within certain thresholds.

### Screening

The DoE evaluates the project proposal and makes a decision on whether EIA is required. This happens when the DoE receives notification of the intention to make a development consent application. In most cases the developer will be asked to fill out an environmental checklist. Conversely the developer may make a voluntary application for a Screening Opinion. In Belize it is not mandatory that the screening decision be recorded and made public. Making the screening process more transparent would increase public confidence in the system.

### Scoping

Once the propose project passes the threshold for EIA, the regulations provides for the developer to request a Scoping Opinion from the DoE. The Scoping Opinion (often included in or referred to as the Terms of Reference (ToR)) will identify the environmental, technical and social information to be gathered during the EIA and reported upon in the Environmental Impact Statement (EIS). The DoE will normally ask the Developer to prepare the ToR and consult relevant authorities and stakeholders likely to be affected by the propose development.

### Environmental Studies

The developer carries out studies to collect and prepare the environmental information stipulated under the ToR.

### Submission of Environmental Information to the DoE

The developer submits the environmental information to the DoE in the form of an Environmental Impact Statement together with the application for development consent.

### Review of Adequacy of the Environmental Information

In Belize there is no formal requirement for independent review of the adequacy of the environmental information before it is considered by the DoE. The DoE is responsible for determining whether the Information is adequate. The Developer will normally submit a first draft of the EIS to the DoE who will evaluate it based on whether it adequately addresses the ToR. The developer may be required to provide further information if the submitted information is deemed to be inadequate. Once the DoE is satisfied the information is adequate the developer is asked to produce and submit the final draft.

### Consultation with Statutory Environmental Authorities, Other Interested Parties and the Public

The environmental information must be made available to authorities with environmental responsibilities and to other interested organizations and the general public for review. They must be given an opportunity to comment on the project and its environmental effects before a decision is made on development consent. Significant amounts of public consultations may be required for controversial projects.

### Consideration of the Environmental Information by the Competent Authority

The environmental information and the results of the consultations must be considered by the DoE in reaching its decision on the application for development consent. The DoE is assisted in this decision making process by the National Environmental Appraisal Committee (NEAC). The NEAC is composed mainly of representatives from the public sector and quasi public bodies plus the NGOs. Their main function is to advise the DoE on the development application and to make recommendations for
improvements where appropriate.

<table>
<thead>
<tr>
<th>Announcement of Decision</th>
<th>The decision must be made available to the public including the reasons for it and a description of the measures that will be required to mitigate adverse environmental effects if development consent is granted. These measures are detailed in an Environmental Compliance Plan (ECP) which the Developer must sign before he begins the implementation of his project.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Decision Monitoring if Project is Granted Consent</td>
<td>There is a requirement to monitor the effects of the project once it is implemented.</td>
</tr>
</tbody>
</table>

The EIA assessment process should be quite straightforward. The important questions are:

- What is the resource at risk and why is it important?
- What will be the expected change or impact of the project on the valued resource?
- How can these effects be avoided, reduced, rehabilitated or compensated?

In any development proposal resulting in change to a PA there will be many factors to be considered. In the first instance we need to know what the values of the PA are. Understanding this help to arrive at a balanced and justifiable decision about change. This leads to a clear statement of a place’s significance and with it the ability to understand the impact of the proposed change on that significance (Chapter 6 addresses this important but often overlooked area of assessment).

Every reasonable effort should be made to eliminate or minimize adverse impacts on significant places. Ultimately, however, it may be necessary to balance the public benefit of the proposed change against the potential harm to the site or area. It is therefore also important to know who benefits from the proposed change and for what reasons.

**Screening** — Screening is a critical part of the EIA process since it allows projects to be differentiated according to three (3) very important criteria. These are as follows:

a) The nature (type) of the project,
b) The size (scope) of the project,
c) The sensitivity of the receiving environment

Within Belize propose developmental projects can fall under any one of three categories:

a) Schedule I - Under the Belize EIA regulations projects listed as Schedule 1 always require an EIA (EIA is mandatory). These projects are classified as likely to lead to “Significant, or irreversible adverse impacts”. Screening of these projects must always lead to a “yes” outcome in regards to EIA.

b) Schedule II – Projects listed under Schedule II may or may not require EIA. This means that EIA for this category of project is discretionary. Projects are evaluated on a case by case basis to see whether they meet certain thresholds or criteria.
Figure 5.1: Diagram of the Screening Process.
Figure 5.2: The Complete EIA process.

Source: USEPA.
c) These projects are classified as having less significant adverse impacts that may be easily prevented or mitigated. The DoE must consider the sensitivity of the project location, potential impacts, as well as the characteristics of projects, in deciding whether EIA is needed.

d) Schedule III – Projects falling within this category are exempt from EIA because minimal or no important impacts are foreseen.

Screening is critical to the EIA process since it determines which projects are to be subjected to further environmental scrutiny and the rigor of the process. In Belize some projects that do not fall under Schedule II may still not be exempt from environmental vetting and may still be required to produce a Limited Level Environmental Study (LLES). Development schemes subject to LLES differ from those subject to full EIA in two important respects:

- The rigor of the assessment process is not as comprehensive,
- The review process does not involve the full NEAC but rather only a few select public agencies.

**Scoping** - Once a development proposal or change of use within a PA is received, the next step should be to set out the scope of work necessary to provide the evidence for decision-making. This indicates the need for early consultation with relevant parties, including the PA managers, local governments, district councils and any affected communities. The scoping report should make clear what is to be done, why, how, when and what are the expected outputs.

Currently in Belize, scoping for an EIA consist of the Terms of Reference only, however scoping should consist of a report in its own right giving the following information.

- Description of the area in question,
- Whether the project falls within the PA or buffer zone,
- An outline of the proposed change or development including the need for change or development,
- A summary of the conditions present on the site and its environs,
- Details of any alternative development being considered,
- An outline methodology and terms of reference for the EIA.
- Any anticipated large or critical impacts

The methodology should include the following

- Organizations or people to be consulted,
- Details of the baseline information to be collected including methods and appropriate study areas, likely receptors and proposed survey and assessment methodology.
The practice of EIA - An EIA is an assessment of the potential significant environmental effects of a proposal. The Environmental Statement (ES) can be thought of as the report about these significant effects. It must focus on the main impacts of the proposal and present these impartially. The purpose of an EIA and its ES is to provide decision makers and other interested parties with as full an understanding of the consequences of the proposal as possible. Decisions can then be made on whether or not the proposal can proceed or should be amended before any work is started. Improved knowledge of the consequences allows easier identification of projects with potentially significant adverse effects. Appropriate steps can then be taken to minimize or remove these effects.

In addition, the opportunity can be taken to strengthen any beneficial impacts. This aspect is often overlooked in Belizean EIAs and the opportunity lost for real beneficial changes. A well-prepared ES, which is well structured and gives an impartial account, will demonstrate to the relevant authorities that potential significant impacts associated with a proposal have been considered in depth. Both the EIA process and the preparation of the ES should improve communication between all those with an interest in the proposal including the planning authorities, other statutory bodies and special interest groups.

It is important to ensure that organizations or individuals undertaking the EIA are suitably qualified and experienced, and that their expertise matches the demands of the site, the scope of the study and the nature and extent of the proposed changes. In Belize there is wide disparity in the competence and experience of people undertaking EIA for developers. Although the DoE is trying to improve the process and therefore the quality of EIAs produced there are still significant questions in regards to assessment methods and the qualifications and experiences of teams undertaking EIAs. In addition there is a need to provide guidance on the methodology to be used in the field assessments. The evidence to date suggests that most of the methodologies used in field assessments are inadequate; hence the conclusions drawn are questionable at best.

5.2 PAs, Buffer Zones and the Requirements for EIA

The evidence to date suggests that the DoE clearly recognizes the special importance of protected areas and the potential impacts of development projects on such areas when screening development proposals.

The Department considers Schedule II projects to be discretionary. Petroleum exploration projects falls within this category. To date petroleum exploration projects falling within protected areas have all been required to carry out full EIAs or to undertake Limited Level Environmental Study. This is a clear indication that the DoE understands the importance of the
sensitive habitats associated with these sites and the need to prevent adverse and undue impacts to habitats and ecosystems.

This somewhat encouraging picture becomes a little more confusing when other types of developments within protected areas are considered. Numerous forest concessions have been granted in protected areas. To date none of these concessionaires have been required to carry out EIAs or to prepare LLES. In the same vein mining has been allowed in the Chiquibul National Park for years and only recently has an EIA been carried out and only in response to intense lobbying on the part of the Friends for Conservation and Development (FCD) and their NGO conservation partners.

The picture is far less clear in relation to development projects falling within the buffer zones of PAs. There is no evidence to suggest that the DoE treats these areas any differently from other projects falling on public lands.

According to the Belize EIA regulations and its subsequent revisions, the following locations could cause a Schedule 11 project to require a full EIA:

- Projects in or near sensitive and valuable ecosystems such as wetlands, coral reefs and habitat of endangered species;
- Projects in or near areas with archaeological and/or historical sites or existing cultural and social institutions;
- Projects in areas already declared as national parks or other protected areas and areas proposed for national parks or areas of scientific and geological importance.

In addition to this, special consideration is given to certain projects falling under Schedule III which are located near to protected areas and their buffer zones and sensitive sites. According to the EIA Regulations these otherwise Schedule III projects should be referred to the DoE for evaluation viz:

- All applications for development in coastal areas or offshore cayes or islands.
- All applications for development near or in ecologically sensitive areas such as but not limited to swamps, marshes, mangrove forest, lagoons, barrier reef, flood plain etc.
- All applicants for development within or in close proximity to the following areas:
  - Any protected areas.
  - Critical habitats for protected, threatened or endangered species of flora and fauna.
  - Primary Biological Corridors.
5.2.1 Threats to Protected Areas

Threats to PAs are as a result of any human activity or related process that has a negative impact on key biodiversity features, ecological processes or cultural assets within PAs. Common threats include: development and encroachment; agriculture-related threats; energy-related threats such as drilling and mining; transportation, such as road construction and use; human intrusions, including unregulated recreation; modification of natural ecosystems, such as altered hydrological and fire regimes; invasive alien species; pollution; and climate change-related threats, such as coral bleaching and natural disaster such as hurricanes among others.

5.2.2 Assessment and Analysis of Threats to PAs

Threat assessment is an analysis of the type, extent and impact of a suite of changes on the health and integrity of biodiversity within a protected area. This assessment can occur both across the entire protected area system (e.g. underrepresented ecosystems) as well as within individual protected areas.

Steps involved in assessing protected area threats

Typical steps involved in assessing protected area threats include:

a) Assess the biological status of key biodiversity features, including the distribution and viability of species, natural communities and ecological systems.

b) Map the distribution and intensity of threats and their impacts on focal biodiversity features. Threats may occur solely or partially within a protected area, or they may occur entirely outside park boundaries.

c) Map the distribution and intensity of future threats. EIA Practitioners should be able to forecast the trend for many threats using predictive modelling, risk assessments, scenario development and vulnerability analyses.

d) Analyze the results of the threat assessment. EIA Practitioners should consider analyzing the underlying root causes of threats by developing clear conceptual models that show complex relationships and linkages. They should also analyze the cumulative impacts of multiple threats and their complex interactions.

e) Prioritize threats based on their overall contribution to the loss of biodiversity, as well as the feasibility of developing threat abatement strategies.

f) Develop an action plan for threat prevention and abatement, including a detailed list of strategies for abating key threats, a timeline, responsible actors, costs, and indicators for success.
Monitor changes in the status and trends of protected area threats. Perhaps more than any other component of protected area management, threat abatement requires robust indicators and adaptive management planning.

5.2.3 Valuing a Protected Areas Goods and Services

Identifying a protected area's goods and services is essential in assigning a proper value to these goods and services. It stands to reason that if these goods are properly assessed and valued then it is a straightforward proposition to assign management priority proportional to the value of the goods and services.

This is an important concept since impacts from project activities affecting these valued environmental attributes of the PAs must be taken into account in the impact assessment and mitigation sections of EIAs. It is crucial that the values of goods and services are considered when considering the feasibility of investment proposals in Belizean PAs. If the value of goods and services is properly understood it gives PA managers a powerful tool when assessing proposals for development and their potential impacts on these goods and services.

A good starting point is the World Resources Institute (WRI) valuation of the economic contribution of Belize’s coral reefs and mangroves (WRI, 2008). Besides income from fishing and tourism, the study also sought to determine the value of coastal protection from storm and erosion conferred by mangrove and the support it gives to artisanal communities. Additionally these areas support ecosystem services such as recreation, waste assimilation, water quality and carbon storage. Recently a similar study was carried out for Gladden Spit and Silk Cayes Marine Reserve (Hargreaves-Allen, 2010) and another for the Maya Mountain Massif and the Maya Mountain Marine Corridor (Hammond et. al, 2011).

These ‘ecosystem services’ contribute directly and indirectly to the local and national economies and to the welfare of human beings worldwide. Poor awareness of the value of healthy ecosystems often means inadequate conservation investment and actions.

The concept of Total Economic Value (TEV) is now a well-established and useful framework for identifying the various values associated with protected areas. The TEV of a protected area consists of its use values and non-use values. A protected area’s use values are in turn made up of its direct use values, indirect use values, and option values. Non-use values include bequest values and existence values. Table 5.2 illustrates the relationships between these values with explanations given below:

- **direct use values** - of a protected area are values derived from the direct use of the protected area for activities such as recreation, tourism, natural resource harvesting,
Table 5.2: Total Economic Values of Protected Areas.

<table>
<thead>
<tr>
<th>Use values</th>
<th>Non-use values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct use value</strong></td>
<td><strong>Indirect use value</strong></td>
</tr>
<tr>
<td>Recreation</td>
<td>Ecosystem services</td>
</tr>
<tr>
<td></td>
<td>Future information</td>
</tr>
<tr>
<td>Sustainable harvesting</td>
<td>Climate stabilisation</td>
</tr>
<tr>
<td>Wildlife harvesting</td>
<td>Flood control</td>
</tr>
<tr>
<td>Fuel-wood</td>
<td>Ground-water recharge</td>
</tr>
<tr>
<td>Grazing</td>
<td>Carbon sequestration</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Habitat</td>
</tr>
<tr>
<td>Gene harvesting</td>
<td>Nutrient retention</td>
</tr>
<tr>
<td>Education</td>
<td>Natural disaster prevention</td>
</tr>
<tr>
<td>Research</td>
<td>Watershed protection</td>
</tr>
<tr>
<td></td>
<td>Natural services</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option value</strong></td>
<td><strong>Bequest values</strong></td>
</tr>
<tr>
<td><strong>Existence values</strong></td>
<td></td>
</tr>
<tr>
<td>Biodiversity</td>
<td></td>
</tr>
<tr>
<td>Ritual or spiritual values</td>
<td></td>
</tr>
<tr>
<td>Culture, heritage</td>
<td>Community values</td>
</tr>
<tr>
<td>Landscape</td>
<td></td>
</tr>
</tbody>
</table>
hunting, gene pool services, education and research. These activities can be commercial or non-commercial.

- **indirect use values** - are values derived from the indirect uses of the protected area. Indirect uses are largely comprised of the protected area's ecological functions such as watershed protection, breeding habitat for migratory species, climatic stabilisation and carbon sequestration.

- **option values** - of a protected area are values derived from the option of using the protected area sometime in the future. These future uses may be either direct or indirect and may include the future value of information derived from the protected area.

- **Non-use values** - are values which humans hold for a protected area which are in no way linked to the use of the protected area. Two common examples of non-use values are bequest values and existence values.
  - **Bequest values** relate to the benefit of knowing that others benefit or will benefit from the protected area.
  - **Existence values** reflect the benefit of knowing that the protected area exists even though one is unlikely to visit it or use it in any other way.

### 5.3 Public Participation

Public participation and stakeholder involvement is an essential and integral part of the EIA process and should occur throughout the EIA. It is especially important when developmental projects are targeted at protected areas and their buffer zones. It is important that the DoE and the NEAC ensure that minimum requirements are met, that key stakeholders and important issues have not been ignored or under-represented, and that opportunities for effectively resolving underlying conflicts are provided.

At the present time, consultants undertaking EIAs on behalf of developers are required to carry out public consultations during the assessment process and after the Environmental Impact Statements are submitted to the DoE but before the NEAC review the proposal. Current practice allows scant opportunities for stakeholders to contribute to the scoping process which is the most critical part of any EIA. This omission is specially detrimental and glaring when development proposals are for schemes within PAs or their buffer zones.

The process for engaging the public and other stakeholders fails if it is undertaken as an afterthought or poorly implemented or viewed as a one-time event. Opening up real opportunities for engagement by the public, local governments, and interested and affected institutions requires a degree of openness and disclosure which can be uncomfortable for some who fear that it might open the door to unnecessary complication, higher costs and loss of control.
However, the clear lessons from failed public participation processes are just the reverse: if the public is engaged early, and in an open and transparent manner, the process can help to avoid both unnecessary conflict and potential financial hardship due to project delays and occasionally even permit denial.

There is a need for the DoE to review its policies, regulations and procedures in regards to public consultations with a view to making the process more inclusive especially during the early stages of EIA preparation when public input is critical and when potential problems can be spotted at a time when it stands to do the most good. The recommendation is for the DoE to adopt a more robust approach to public consultations especially for developments targeted at PAs or their buffer zones.

The investor should conduct preliminary consultations with relevant agencies and institutions in order to make an assessment to whether appropriate conditions exists on the proposed project site; availability/suitability of project site, compensations, conflicts of occupancy, land rights, local reactions to the project and the probability of relevant authorities granting approval. These activities are pre-feasibility assessments, which should be done long before the development of a fully-fledged project proposal.

5.4 Application of Strategic Environmental Assessment

Many of the potential detrimental effects of projects on PAs and their buffer areas could be spotted and rectified early if Strategic Environmental Assessment (SEA) were applied. Currently SEA is not mandatory for any type of project under the Belize Environmental Regulations and is consequently seldom applied to project developments although there are indications that this may change.

Strategic Environmental Assessment is the formal, systematic evaluation of the likely significant effects of implementing a plan or program on the environment. The process evaluates the opportunities that the environment offers to development and the constraints that it imposes. The practice of SEA is important to identify possible negative impacts very early on in the process, in order to inform both the development design and the planning process in a pro-active rather than a reactive manner.

SEA seeks to concisely determine the current environment condition of an area and identify any factors or issues which threaten or which could threaten the future state of an area, and recommends ways to address these issues and prevent environmental degradation. SEA is structured to be a proactive iterative process that strengthens the role of environmental issues in strategic decision making, and emphasizes the need to integrate environmental (biophysical, social and economic) considerations into the earliest stages of development planning.

It is undertaken during the preparation period of the plan or program, and before a decision is made to formally adopt it. It identifies, describes and evaluates the likely significant
effects on the environment of implementing the Plan’s (project) objectives. Essentially SEA is a process that should be used to encourage and promote sustainable development on a strategic level (i.e. for areas, regions or sectors of development). Typical and effective application of SEA would include proposals for development in a PA since these are sites that are environmentally sensitive and may respond badly to certain types of development.

The SEA process can assist in and improve the quality of decision making by including the following processes:

- Facilitating the identification and appraisal of alternative plan strategies;
- Raising awareness of the environmental impacts of the Plan’s implementation; and
- Encouraging the inclusion of measurable targets and indicators.

It is important to appreciate the differences between SEA and the EIA processes. These are summarized in Table 5.3 below.

**Table 5.3: Comparison of EIA and SEA.**

<table>
<thead>
<tr>
<th>EIA</th>
<th>SEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is reactive to a development proposal</td>
<td>Is proactive and informs development proposals</td>
</tr>
<tr>
<td>Assesses the effect of a proposed development on the environment</td>
<td>Assesses the effect of the environment on development needs and opportunities</td>
</tr>
<tr>
<td>Addresses a specific development project</td>
<td>Addresses areas, regions or sectors of development</td>
</tr>
<tr>
<td>Has a well defined beginning and end</td>
<td>Is a continuing process aimed at providing information at the right time</td>
</tr>
<tr>
<td>Assesses direct impacts and benefits</td>
<td>Assesses cumulative impacts and identifies implications and issues for sustainable development</td>
</tr>
<tr>
<td>Focuses on the mitigation of impacts</td>
<td>Focuses on maintaining a chosen level of environmental quality</td>
</tr>
<tr>
<td>Narrow perspective and a high level of detail</td>
<td>Wide perspective and a low level of detail to provide a vision and overall framework</td>
</tr>
<tr>
<td>Focuses on project-specific impacts</td>
<td>Creates a framework against which impacts and benefits can be measured</td>
</tr>
</tbody>
</table>

**Overarching drivers and Principles of SEA Implementation**

- SEA is driven by the concept of sustainability.
- SEA identifies the opportunities and constraints which the environment places on the development of plans and programs.
- SEA set the criteria for levels of environmental quality or limits of acceptable change.
- SEA is a flexible process which is adaptable to the planning and sectoral development cycle.
- SEA is a strategic process, which begins with the conceptualization of the plan or programme.
• SEA is part of a tiered approach to environmental assessment and management.
• The scope of an SEA is defined within the wider context of the environmental processes.
• SEA is a participative process.
• SEA is set within the context of alternative scenarios.
• SEA includes the concepts of precaution and continuous improvement.

Strategic Environmental Assessment should be made mandatory for any plans or programs in the agriculture, forestry, fisheries, energy, mining and water sectors and any other developments where land use changes is anticipated within protected areas.

Table 5.4 below summarizes the steps that need to be undertaken when implementing SEA.

Table 5.4: Steps in carrying out a SEA.

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify broad plan and program alternatives</td>
<td>Determine the physical boundary of the site, level of detail to be addressed and alternatives to be assessed if applicable.</td>
</tr>
<tr>
<td>Screening</td>
<td>Determine overarching project and assess if a SEA is necessary.</td>
</tr>
<tr>
<td>Scoping and situation assessment</td>
<td>Interested and affected parties provide inputs, define vision, compile a detailed resource inventory define critical issues, sustainability objectives, criteria and indicators, environmental opportunities and constraints.</td>
</tr>
<tr>
<td>Sustainability parameters</td>
<td>Formulate parameters and guidelines for the project.</td>
</tr>
<tr>
<td>Develop and assess alternative plans and program</td>
<td>Adjust the plans and programs in terms of the assessment. Identify environmental alternatives.</td>
</tr>
<tr>
<td>Decision-making</td>
<td>Review by authorities and/or client.</td>
</tr>
<tr>
<td>Develop a plan for monitoring and auditing</td>
<td>Plan monitoring and auditing activities and obtain commitment for these activities.</td>
</tr>
<tr>
<td>Implementation</td>
<td>Implement the proposal as well as monitoring and auditing activities.</td>
</tr>
</tbody>
</table>

5.5 The Significance of PA Designation in the Assessment Process

In carrying out assessments, best practice indicate that there is a hierarchy when assessing the importance of impacts on PAs (See Table 5.5). In this hierarchy, sites with international designations e.g. World Heritage Sites are accorded the highest importance followed by National Sites with the lowest importance accorded to sites having local designations or only regional importance.

World Heritage Sites – For the purposes of Environmental Impact Assessment, World Heritage Sites should be viewed as “sensitive areas”. World Heritage Sites have Outstanding
Universal Value (OUV), which are considered part of the world heritage of mankind as a whole and deserving protection and transmission to future generations.

Like all sites falling under international designations they should be accorded “highest” status within the PA designation system. This means that any project in Belize falling within or adjacent to a World Heritage Site must be subjected to the highest rigor of assessment. Planning Authorities must require EIA to be carried out for any development proposal in, or partly in, a World Heritage Site if they consider it is likely to have a significant effect on the environment. In addition, design and access statements should be required for development proposals affecting World Heritage Sites.

EIA is often used to formally evaluate impacts to World Heritage Sites, however there are deficiencies in the EIA process in regards to World Heritage Sites which requires adaptations to the process and the need for additional inclusiveness.

**Table 5.5:** IUCN PA Management Objectives.

<table>
<thead>
<tr>
<th>Management objectives</th>
<th>IUCN protected area management category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ia</td>
</tr>
<tr>
<td>Scientific research</td>
<td>1</td>
</tr>
<tr>
<td>Wilderness protection</td>
<td>2</td>
</tr>
<tr>
<td>Preservation of species and genetic diversity</td>
<td>1</td>
</tr>
<tr>
<td>Maintenance of environmental services</td>
<td>2</td>
</tr>
<tr>
<td>Protection of specific natural and cultural features</td>
<td>–</td>
</tr>
<tr>
<td>Tourism and recreation</td>
<td>–</td>
</tr>
<tr>
<td>Education</td>
<td>–</td>
</tr>
<tr>
<td>Sustainable use of resources from natural</td>
<td>–</td>
</tr>
<tr>
<td>Maintenance of cultural and traditional attributes</td>
<td>–</td>
</tr>
</tbody>
</table>

Key:
1 Primary objective; 2 Secondary objective; 3 Potentially applicable objective; – Not applicable
Ia Strict Nature Reserve; Ib Wilderness Area; II National Park; III Natural Monument; IV Habitat/Species Management Area; V Protected Landscape/Seascape; VI Managed Resource Protected Area

Source: IUCN, 1994
The UNESCO guidelines advocate a more global approach to assessing these sites with the focus being on their Outstanding Universal Values. This captures the essence of World Heritage Sites as “places of outstanding universal value to the whole of humanity” having natural significance which is so exceptional as to transcend national boundaries. Emphasis should be placed on cumulative impacts and incremental change (UNESCO 2010).

Effective management of World Heritage Sites is therefore concerned with identification and promotion of change that will conserve and enhance their outstanding universal value, authenticity and integrity and with the modification or mitigation of changes that might change those values. Important concepts in assessing World Heritage Sites are in regards to Limits of Acceptable Change and Absorption Capacity. Appropriate tools to carry out visual impact assessments are key to assessing impacts on these areas. In developing policies to protect and enhance World Heritage Sites planning authorities should aim to satisfy the following principles:

- Protecting the World Heritage Site and its setting, including any buffer zone, from inappropriate development.
- Striking a balance between the needs of conservation, biodiversity, access, the interests of the local community and the sustainable economic use of the World Heritage Site in its setting.
- Need to protect World Heritage Sites from the effect of changes which are singly relatively minor but which, on a cumulative basis, could have a significant effect.
- Enhancing the World Heritage Site where appropriate and possible through positive management.

The UNESCO Operational Guidelines seek protection of the immediate setting of each World Heritage Site, of important views and of other areas that are functionally important as a support to the site and its protection (ibid). The Guidelines suggest the designation of a buffer zone (with legal restrictions placed on its use) around the World Heritage Site wherever this may be necessary for its conservation.

Ramsar Sites - The Ramsar Convention has long recognized the importance of applying impact assessment techniques to situations where the ecological character of Ramsar sites and other wetlands may be threatened by developments. The Ramsar Convention sees the use of EIA “as an aid to the wise use of wetlands”.

Resolution VII.16 calls upon the Contracting Parties to ensure that any projects, plans, programs and policies with the potential to alter the ecological character of wetlands in the Ramsar List, or impact negatively on other wetlands within their territories, will be subjected to rigorous impact assessment procedures (Ramsar, 2010). The Resolution requires the parties to ensure that impact assessment procedures seek to identify the true values of wetland ecosystems in terms of the many functions, values and benefits they provide and to include these environmental, economic and broader social values in decision-making and management processes.
Questions of relevance from a biodiversity perspective in this regard include:

a) Would the intended activity affect the biophysical environment directly or indirectly in such a manner or cause such biological changes that it will increase risks of extinction of genotypes, cultivars, varieties, populations of species, or the chance of loss of habitats or ecosystems?

b) Would the intended activity surpass the maximum sustainable yield, the carrying capacity of a habitat/ecosystem or the maximum allowable disturbance level of a resource, population, or ecosystem, taking into account the full spectrum of values of that resource, population or ecosystem?

c) Would the intended activity result in changes to the access to, and/or rights over biological resources?

National Parks – PAs under this designation have been bestowed with a high level of protection and any developments within a National Park should ensure sustainable use of natural resources. This is safeguarded by a policy of subjecting all investments or development activities to EIA prior to their acceptance within the National Park and ensuring that the recommendations of the EIA are agreed by the investor before implementation.

In order to ensure that this is done, the National Park’s management should ensure that the proposed investments/development projects or activities within the PA comply with the following:

a) Do not compromise the special sensitive and fragile ecosystems typical to National Parks, and other valued ecosystem components.

b) Meet the requirements of the approved Management Plan.

c) Do not contradict the purpose and objectives of the National Park.

Each type of investment in a National Park will have its unique requirements, and will have to be treated independently. Investment in a National Park and/or buffer areas will involve scrutiny and adherence to two main factors:

I. Technical issues such as site selection for the proponents facilities;

II. Regulatory issues such as applying for permits, licences, title deeds and rights to the use of resources.

a. The National Park management for initial assessment,

b. DoE for EIA screening,

c. Sectoral ministries (Ministry of Natural Resources and Agriculture; Ministry of Forestry, Fisheries and Sustainable Development; Ministry of Trade, Investment Promotion Private Sector Development and Consumer protection; Ministry of Energy, Science, Technology and Public Utilities etc.) for technical matters.
**Marine Reserves** – Marine reserves allow some forms of sustainable use through a system of zonation, however the primary objective is protection of biodiversity and habitats. Guidelines for Assessment of investment proposals in marine reserve should be conceived and guided on the following premises:

- The acceptance or rejection of any development in the marine reserve shall be guided by the ecological sensitivity of the site requested and the impacts of the proposed development on the ecosystem and the communities living within or near the proposed site.
- The physical size of the project and magnitude of investment should not be used as credible indicators of the severity of impacts on marine reserves’ sensitive ecosystems.
- Development within the marine reserve should not be guided by short-term economic gains.
- All projects planned in marine reserves should undergo an approval process that assures suitability of the project to the marine reserve.

**Assessment within the Buffer Zones**

In most countries there are set distances for the zones of influence around PAs. In these zones it is expected that the degree for assessment of projects will be more rigorous than outside the zones. Commonly accepted distances for the zones of influence are as follows:

a) International Sites (e.g. World Heritage Sites) – 10kms radius from the PA boundary.

b) IUCN categories 1 to IV sites – 5Kms radius from the PA boundary.

c) IUCN categories V to VI sites – 3Kms radius from the PA boundary.

d) Local Sites - 1Km radius from the PA boundary.

**Investment and Development Constraints within PAs**

Notwithstanding the need to generate revenue by encouraging investments it is important to understand that not all Belizean PAs and not all zones within PAs will be open for investments. Some PAs are under strict management categories that allow investors from the 8 identified sectors little latitude to invest given the PAs strict mandate for biodiversity protection. Likewise many PAs are now divided into zones with some zones falling under very strict management categories. For the most part these zones will be no go areas for investors except where the investor intends to conduct education and research activities and even this will be subject to stringent biodiversity protection safeguards.
5.6 The Significance of Management Plans and Limits of Acceptable Change

The PA management plan is a critical document to be consulted during the assessment of potential projects within PAs and their buffer zones. The management plan would be expected to highlight the goal and the vision for the PA. Management objectives must define and articulate the ‘desired’ future environmental status of the PA.

A properly constructed management plan would also have information about the ecosystems of the site, biodiversity values, management zones, rules and regulations, threats and opportunities and management constraints and limitations among others. Very importantly, the management planning documents should speak to issues of carrying capacity and limits of acceptable change.

The management plan should describe how investments will be promoted and managed. In a sense, protected area plans for managing investment is an attempt to optimize the investment benefits while minimizing its environmental impacts and costs.

Investment policies and guidelines are an important component of the overall management framework that should be enshrined in the management Plan. Development may pose both a threat to the integrity of natural areas and an opportunity to support conservation by encouraging investment and the development of infrastructure. In many cases the revenue generated can help to offset some of the impacts while promoting sound conservation practices and support the local economy which can reap big conservation rewards for the PA.

Table 5.6 indicates the roles and responsibilities of PA managers, the Government and investors.
### Table 5.6: Summary of the Roles and Responsibilities of Parties Involved in PA Management and the EIA Process

<table>
<thead>
<tr>
<th>STEP 1 - Preparation &amp; Submission of Letter of Intent</th>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide to the investor relevant documents such as EIA Guidelines/manual</td>
<td>Submit Letter of Intent to the PA management authority</td>
<td>Provide to the investor relevant documents such as Management Plans, subsidiary regulations and Acts relevant to the establishment of the PA etc.</td>
<td>Determine the acceptability of the project in PA considering its designation and mandate and the type of project being proposed.</td>
<td>2-5 days</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP 2 - Initial Assessment by PA Management Authority</th>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide to investor map(s) of PA Management zones and special biodiversity management areas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP 3 - Registration for Environmental Assessment</th>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Register project at DoE</td>
<td>Provide DoE contact details to Project Proponent if required</td>
<td>Provide appropriate sector guidelines, policies and legal requirements.</td>
<td></td>
<td></td>
<td>5 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP 4 - Screening</th>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine the level of assessment using checklists for screening projects in PAs. Prepare and submit to project proponent a screening report.</td>
<td>The Relevant PA Management Authority participates in screening of project</td>
<td></td>
<td>Ministry represented on the screening panel/consulted in the screening exercise.</td>
<td></td>
<td>30 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP 5 - Scoping &amp; TOR for the EIA</th>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approve ToR for the EIA study in consultation with the PA management authority</td>
<td>Undertake scoping using general scoping guidelines and specific scope of issues to be covered in EIS, Compile and submit to DoE a scoping report and draft ToR</td>
<td>Provide project proponent/consultant relevant information, data, stakeholder identification and important contacts etc.</td>
<td>Provide project proponent/consultant all relevant information, data, stakeholder identification and important contacts etc.</td>
<td>14-30 days</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP 6 - Undertaking the EIA</th>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation for Study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Depends on project characteristics</td>
</tr>
<tr>
<td>EIA practitioner/consultant compile baseline information and undertake the study.</td>
<td>Provide guidelines on environmental characteristics for PAs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare an EIS</td>
<td>Specify minimum content for the EIS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indicate availability for consultation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP 7 - Reviewing the EIA</th>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review the EIS report using review guidelines for EIAs in PAs</td>
<td></td>
<td>Ensure EIS is accessible to a wide range of stakeholders. Provide advice/participate in the review process or conduct independent review</td>
<td></td>
<td></td>
<td>30 days</td>
</tr>
</tbody>
</table>
### Socio-Economic and Environmental Assessments of Priority Protected Areas and Development of Strategies and Guidelines for investing in Protected Areas in Belize

<table>
<thead>
<tr>
<th>Role of DoE</th>
<th>Role of Investor</th>
<th>PA Management</th>
<th>Competent Authority (Ministry of Forestry, Fisheries and Sustainable Development)</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>• determine adequacy of EIS</td>
<td>• review process. • Undertake independent review of EIS and consider recommendations from DoE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Organize Public Reviews</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Submit to the PA management authority recommendations on the EIS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STEP 8 - Preparation of Detailed Project Proposal**

- Prepare a detailed project proposal incorporating the EIA recommendations.

**STEP 9 - In-depth Assessment by PA authority**

- Submit to the PA management authority the EIA report, the DoE review report, and detailed project proposal

- In-depth Assessment conducted by the Advisory Committee of the PA
- Involvement of all interested parties

**STEP 10 - Determination by the PA Board of Trustees**

- PA Board of Trustees considers recommendation and approves, or rejects or recommends modification
- Set the approval conditions

**STEP 11 - Environmental Management and Monitoring**

- Project proponent prepare management and monitoring plans
- Project proponent sign a compliance contract i.e. commitment to implement the identified impact management measures.

- Set and/or endorse monitoring criteria
- Endorse monitoring criteria
- Review monitoring reports or conduct own monitoring

**STEP 12 - Environmental Auditing**

- Subject the project to periodic Environmental Audits.

- PA personnel represented in the auditing panel
- Review and approve Audit report if warranted
- Reserve right to conduct independent audits

- Ministry represented on the auditing panel
- Approve Audit report
- May conduct own independent audits
5.7 Assessment Guidelines for Investments in the Six Sectors

The assessment guidelines are predicated on the impacts identified from the consultations with stakeholders and investors undertaken earlier in this study and from observations made during the field visits to PAs. They are important, because they identify the areas of concern to stakeholders where they believe impacts are occurring and therefore areas that need to be addressed.

The guidelines express the pathway and the goals we want to achieve when contemplating sustainable investments in PAs and their buffer zones. They point to a level of improvement and a state of advancement towards achieving sustainable development and the protection of biodiversity. Guidelines indicate expectations about behavior and codes of conduct and set out specific actions that should be taken to comply with the principles of best practices.

The guidelines presented here are not legally binding; they simply represent good practices that should be followed when undertaking developments in the six sectors within protected areas and their buffer zones. Failure to follow these guidelines could result in projects that are neither sustainable nor environmentally accountable.

The guidelines are not comprehensive and should not be regarded as the last word in environmental protection, however they provide a useful reference for developers, stakeholders and statutory bodies when considering the merits of a propose project. They should be selected and adjusted according to the special conditions of the area where the propose investment project is being evaluated and therefore should not be assumed to represent a complete or obligatory list. Under certain situations, impacts not covered in these guidelines may occur. It is always best to consult other sources in such situation.

The assessments must also consider whether the activity is likely to have any significant cumulative impacts. This will be done by identifying and taking into account any interactions by the propose project with existing and proposed activities in the immediate locality and the region. Particular regard should be given to cumulative impacts resulting from interactions with other projects having a similar nature to the one being proposed.

Specific objectives of these Guidelines include:

a) Improve environmental performance in the various sectors,

b) Improve EIA document quality and quality of EIA decision-making for the various sectors,

c) Improve efficiency and effectiveness of the EIA process for projects falling within these sectors by clarifying expectations, providing detailed guidelines and aligning document preparation and review,

d) Increase confidence on the part of PA managers and stakeholders that project impacts have been properly considered and addressed.

e) Provide technical guidelines for the identification of environmental, social and economic impacts on the sector activities (see Chapter 6),
f) Identify potential for avoidance and mitigation of adverse environmental, social and economic impacts from the various sectors,
g) Help to establish industry best practice to empower options for consideration by industry and government officials,
h) Lay the basis for public participation throughout the process which should be a specific priority for investments in PAs and buffer zones.

If these guidelines are followed they build the argument that developments in these sectors are taking place in a sustainable and responsible manner, thereby promoting public acceptance and helping to improve the image of the investors involved. Table 5.7 summarizes the most important developmental impact by sector as identified in the public consultations (Conducted with PA managers, buffer zone community members and investors).

Table 5.7

Impacts were identified after a series of exhaustive consultations with stakeholders across a range of sectors and responsibilities. Site visits were made to protected areas across the country (including terrestrial and marine PAs) at which time PA managers and buffer community members were interviewed. Subsequently the team interviewed investors from the eight (8) productive sectors identified for the study. Other interviews were carried out with relevant Government Departments and trade and investment organizations. This aspect of the study is detailed in an earlier interim report submitted to the NPAS (Nextera, 2012).

It is becoming clear that to manage social and environmental impacts, the following guiding considerations and principles must be embraced:

- It is impossible not to have negative effects as a consequence of economic activity in a protected area;
- All economic activities within a protected area represent a set of trade-offs;
- Impacts cannot be avoided, but they can be managed based on established objectives or an understanding of the biophysical or social conditions desired; and
- For management to be effective and beneficial to both protected areas and society, management intervention should:
  - Be scientifically and socially informed,
  - Allow for the use of a combination of scientific and value judgments,
  - Allow broad public participation,
  - Be cost-effective,
  - Be timely,
  - Be able to assess causes of impacts,
  - Minimize impacts,
  - Allow for alternative management strategies through adaptive and corrective management based on measurable assessment of indicators and standards.
### Table 5.7: Identification of important impacts by sector.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Stage/phase</th>
<th>Main Impacting activities</th>
<th>Potential Impacts on Habitats and Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tourism</strong></td>
<td>Site Preparation and Access</td>
<td>Land clearing of vegetation</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Rerouting of natural drainage and land contours</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Operation of machinery, generators etc</td>
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<tr>
<td></td>
<td></td>
<td>Building of canals, piers, seawall, marinas, buildings and other infrastructure</td>
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<td></td>
<td></td>
<td>Guiding and Tours</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Tours into protected areas and sensitive sites</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Large number of visitors exceeding carrying capacity of sensitive sites and habitats</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Feeding and petting of wildlife creating dependency</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Hospitality and Services</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Production of large volumes of liquid and solid waste</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Consumption of large amounts of electricity and water</td>
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<tr>
<td><strong>Forestry</strong></td>
<td>Access Roads facilities and infrastructure</td>
<td>Stripping of forest cover for roads</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Quarrying and soil stripping</td>
<td>√</td>
</tr>
<tr>
<td>Sector</td>
<td>Stage/phase</td>
<td>Main Impacting activities</td>
<td>Potential Impacts on Habitats and Species</td>
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<td>------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Harvesting and Extraction</td>
<td></td>
<td>Damage to noncommercial species and trees below harvesting age</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Loss of seed trees and trees of older age cohorts</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Operation of wheel and track machinery compacting soils</td>
<td>√ √ √</td>
</tr>
<tr>
<td>Milling and Processing</td>
<td>Operation of machinery resulting in release of oil pollutants into water and soils</td>
<td></td>
<td>√ √</td>
</tr>
<tr>
<td>Harvest Area Abandonment</td>
<td>Abandonment of equipment buildings and infrastructure</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Agriculture and Fisheries</td>
<td>Land Clearing and soil disturbance</td>
<td>Removal of forest cover and plowing of soils</td>
<td>√ √ √ √ √</td>
</tr>
<tr>
<td></td>
<td>Use of chemicals to destroy pest and selectively remove unwanted plant species</td>
<td></td>
<td>√ √ √</td>
</tr>
<tr>
<td></td>
<td>Introduction of new species and alteration of natural gene pool</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Use of illegal extraction methods including nets spears etc.</td>
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<td>√ √ √</td>
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<tr>
<td></td>
<td>Failure to follow rules governing extraction of species from controlled zones</td>
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<td>√ √ √</td>
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<tr>
<td></td>
<td>Extraction of prohibited and/or undersized species</td>
<td></td>
<td>√ √ √</td>
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<tr>
<td>Sector</td>
<td>Stage/phase</td>
<td>Main Impacting activities</td>
<td>Potential Impacts on Habitats and Species</td>
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<td></td>
<td></td>
<td></td>
<td>Habitats deterioration or fragmentation</td>
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<td></td>
<td>Disturbance and/or displacement of sensitive species, individuals or populations</td>
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<td></td>
<td></td>
<td>Loss of rare or endangered species, species, individuals or populations</td>
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<td></td>
<td></td>
<td>Changes in Species composition and/or abundance</td>
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<td></td>
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<td></td>
<td>Site colonization by alien and invasive pioneer species</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Changes and degradation of aquatic ecosystems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soil, water and air pollution</td>
</tr>
<tr>
<td>Allowable Catch</td>
<td></td>
<td>Exceeding of annual allowable catch</td>
<td>√</td>
</tr>
<tr>
<td>Water Resource Users</td>
<td>Abstraction of water</td>
<td>Use of chemicals and physical processes to make water potable and fit for consumption</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Generation</td>
<td>Dam Construction</td>
<td>Alteration of natural stream flow</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Removal of forest for lake reservoir resulting in loss of habitats</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Excavation and tunneling resulting in release of sediment plumes into waterways</td>
<td>√</td>
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<tr>
<td></td>
<td></td>
<td>Dam operation</td>
<td>Impoundment of water resulting in nutrient loading</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Runoff into waterways resulting in concentration of chemicals</td>
<td>√</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disruption to annual hydrological cycles</td>
<td>√</td>
</tr>
<tr>
<td>Oil and Mineral Extraction</td>
<td>Exploration</td>
<td>Access road construction and movement of workers and equipment</td>
<td>√</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Exportatory drilling and site investigation to determine deposits</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Site Preparation</td>
<td>Stripping of forest cover</td>
<td>√</td>
</tr>
<tr>
<td>Sector</td>
<td>Stage/phase</td>
<td>Main Impacting activities</td>
<td>Potential Impacts on Habitats and Species</td>
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<td>-----------------------------------------------------------------------------------------</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Habitat loss deterioration or fragmentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stripping of soil overburden</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Installation of drilling infrastructure including buildings, roads, washers conveyors etc</td>
<td>✓</td>
</tr>
<tr>
<td>Mineral</td>
<td>extraction</td>
<td>Blasting and excavating</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of water pumps to blast away soils and overburden</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transport of raw materials</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stockpiling of waste and mineral bearing ore</td>
<td></td>
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<tr>
<td>Processing</td>
<td></td>
<td>Use of dangerous chemicals for ore extraction</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Leaching of chemicals and release of fuels etc into water and soils from processing of ores</td>
<td></td>
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<tr>
<td>Abandonment</td>
<td></td>
<td>Abandonment of equipment and infrastructure and failure to carry out site rehabilitation/reinstatement</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scarification of landscape as a result of failure to revegetate, remove waste piles</td>
<td></td>
</tr>
</tbody>
</table>
5.7.1 Assessment Guidelines for Development in the Tourism Sector

Any tourism development within Belizean PAs and their buffer zones must be sustainable and meet all relevant sustainability criteria. The World Tourism Organization (WTO) defines sustainable tourism as:

"Sustainable tourism development meets the needs of present tourists and host regions while protecting and enhancing opportunity for the future. It is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity, and life support system." (http://www.world-tourism.org/sustainable/doc/a21-def.pdf)

Tourism is by far the biggest investment sector in Belize’s protected areas and buffer zone regions. The relationship between sustainable tourism development and PAs is often seen as compatible, complimentary and mutually reinforcing especially when compared to other sectors, which are considered more likely to produce negative biodiversity impacts.

A. Guidelines for Sustainable Tourism within PAs and their Buffer Areas

Sustainable tourism should at its core support the goal of national economic development while being responsive to community participation and the objectives of biodiversity conservation. Tourism developments in Belize should strive to follow the CBD Guidelines for Biodiversity and Tourism Development as well as UNESCO’s Man and Biosphere concept.

In essence a good tourism enterprise should have the following salient features and adhere to the following guidelines:

1. The enterprise should link into the country’s sustainable development strategy and plan and must be integrated into existing regional development and land use planning.

2. The developer must show it is in compliance with and abide by international standards and national legislation such as in the areas of health, safety, labour, and environmental protection.

3. The developer should implement a long-term sustainability management system that is suitable to its location and scale, and that considers environmental, socio-cultural, product quality, health, and safety issues.

4. The tourism enterprise should be integrated into existing spatial planning instruments as long as this exists in the PA management plan and the National Land Use Policy.

5. When considering tourism developments the precautionary principle should hold especially as it relates to the anticipation of future development and cumulative impacts.
6. The PA management should push for tourism development under long term concessionary agreements to ensure investments and management of resources on a sustainable basis.

7. An Environmental Impact Assessment should be undertaken prior to development of any tourism project within PAs or their buffer zones.

8. EIA procedures should recognize the cumulative as well as the individual impacts of all developments on the environment.

9. Investments in the ecotourism sector could produce tangible benefits to communities and provide a lifeline of financial support for beleaguered and embattled PAs, In essence sustainable tourism investments in PAs and Buffer communities should have the following features:
   - Ecological sustainability,
   - Economic viability,
   - Be ethically and socially equitable,
   - Focused on the long term vision and characterised by a long term perspective.

10. Ideally tourism projects should be accepted by the local communities and respect local cultural and social norms. The enterprise should blend harmoniously with the local social environment.

11. The tourism investor should offer the means for local entrepreneurs to sell sustainable products to its clientele that are based on the area’s nature, history, and culture.

12. Tourism businesses should make use of local supply of goods and services since it contributes to the income of locals and reduces environmental impacts from transportation.

13. Sustainable tourism enterprises should strive to reduce leakage of benefits from the local area.

14. Sustainable tourism should respect the cultural values of the local population and blend harmoniously into it.

15. Tourism enterprises should be informative and promote respect among visitors for local culture and the environment within PAs and the buffer region.

16. Local people should be allowed to participate in the tourism business through capacity building, education and training programs.

17. The enterprise should actively supports initiatives for social and infrastructure community development including education, health, infrastructure and sanitation.

18. Local natural resources should be used in a planned, coordinated and sustainable way.
19. Tourism Marketing should encourage visitation by Belizeans both as a revenue generating measure and to increase local appreciation and support for PAs. This potential market segment is currently grossly overlooked.

20. Tourism enterprises should observe all existing legislation on the protection of natural resources (including wild flora and fauna) and the management planning framework of the PA and its buffer area.

21. The enterprise should not exceed the natural carrying capacity of the region and the carrying capacity of the site.

22. Management should determine the carrying capacity or limits of acceptable change and operationalize it into its corporate policy. This means the following
   a. Maximum visitor numbers based on acceptable levels of impacts,
   b. Maximum use intensity and the corresponding mechanisms to control these numbers,
   c. Actions to be taken if the defined numbers are exceeded and the assigning of responsibilities for these actions.

23. The project proponents should investigate the effects of additional consumption of water, fuels, building materials etc. on the local environment prior to project commencement using scientifically viable methods.

24. The activities of the company should not jeopardize or excessively consume basic services, such as water, energy, or sanitation, which normally accrue to neighbouring communities and which could result in shortages.

25. Hunting should not be allowed and fishing should only be carried out in accordance with specific management plans such as designated zones, seasonality etc.

26. No captive wildlife should be kept for display except in cases where they have been rescued.

27. Interactions with wildlife for visitor appreciation must not produce adverse effects on the viability of populations in the wild.

28. A mechanism should be established for compensatory contribution to conservation management. This could take the form of biodiversity offset measures to compensate for forest lost in critical ecosystems along coastal areas.

29. The business should use native species for landscaping and restoration, and take measures to avoid the introduction of invasive alien species.

30. Tourism establishments should strive to reduce resource consumption and focus on the efficient use and proper disposal and recovery of resources. This suggests making use of scientific and technological innovation to achieve these objectives where appropriate.
31. Pollution and consumption should be kept as low as possible so as to decrease production of liquid and solid waste and the release of harmful chemicals to the atmosphere and other receptors.

32. Wastewater, including grey water, should be treated effectively and reused where possible.

33. A solid waste management plan should be implemented which emphasises measures for reducing, reusing and recycling. Quantitative goals should be established to minimize waste that is not reused or recycled.

34. The establishment should strive to use biological instead of chemical controls for pest. It should reduce use of harmful substances, including pesticides, paints, swimming pool disinfectants, and cleaning materials.

35. Responsible tourism within sensitive areas requires the adoption and use of efficient environmentally friendly technology for saving energy and encouraged to use renewable energy generation technology (e.g. solar thermal collectors, photovoltaic and wind power systems).

36. Concerted effort should be made to reduce water consumption throughout all areas of management. Each establishment should try to reduce consumption to 200 to 300 litres per day per person especially on the Cayes.

37. Provisions should be made for staff to receive periodic training regarding their role in the management of environmental, sociocultural, health, and safety practices.

38. The enterprise should plan for the careful integration of tourism-related construction, infrastructure and activities into the given natural and cultural environment as is appropriate for the design, the level of technology and the intensity of use.

39. The tourism enterprise should as far as is practical in its purchasing policy favour environmentally friendly products for use in building materials, capital goods, food, and consumables.

40. The tourism developer should observe traditional land use rights, which may exist although not enshrined in national legislation or in existing land ownership documents.

41. Tourism operators should provide written background information to travellers about how they can minimize their impacts while visiting environments and cultures different from their own.

42. Tourism operators should strive for certification or eco-labeling schemes.
43. To the extent possible, tourism enterprises should strive to make direct funding contribution to protected areas, conservation programmes and promote cooperation between communities and protected areas.

44. Sustainable tourism products (such as from sales) should integrate and promote information on biodiversity conservation and the preservation of cultural heritage as well as promote support for the PA.

45. The tourism establishment should have strict guidelines for visits to culturally or historically sensitive sites, in order to minimize visitor impact and should not participate in nor encourage illegal trading in artefacts.

46. There should be a deliberate and sustained focus on monitoring and controlling visitor impacts, and on educational measures to reduce impacts including active resource protection measures.

47. The tourism enterprise is expected to manage its environmental impact throughout all of its activities and use industry standards, environmental audits and adopt a management philosophy of “best practices” throughout.

5.7.2 Assessment Guidelines for Development in the Forest Sector

Developments in the forest sector within PAs and buffer areas should meet the requirements for environmental and social sustainability. When regulating forest investments in these areas, Belizean forestry projects vetted by the DoE must be able to prove their credibility for sustainability and the protection of biodiversity. This suggests the need for the environmental assessment process to emphasize certification under a verifiable management and monitoring framework.

Forest certification is a tool that combines two processes viz:

1. Targets for sustainable forest management using applicable criteria. On the basis of these criteria, verifiable forest management requirements can be formulated.

2. The verification procedure that is meant to ensure that social, environmental and economic requirements are actually met by forest users.

If adequate environmental standards are observed, a quality label can be attached to the product providing an instantly recognizable proof of sustainable production for the end-user. Generally under certification the timber forestry operator can sell his products at a higher price, more easily access new markets and gain improve resilience against incipient market restrictions. In addition to this the image of the company (and the timber industry) will improve among the various stakeholders and ensure the long term availability of timber.
A word of caution is warranted in terms of the rigor of the certification process and vetting requirements. If stakeholders and the statutory authorities in Belize decide to push for Certification or a label that is not economically viable (e.g. because of requirements that are too demanding) they will probably be rejected by the timber industry which would then subsequently see a decline or would vigorously fight the proposal.

In particular forestry projects in PAs must conform to the following:

- Have long term licensing agreements which will encourage long term investments and favour wise stewardship of resources,
- Maintain standards and requirements that can be verified at the operational level,
- Operations conform to progressive international standards and norms in forestry management,
- Forestry operation is amenable to on-site verification and work with process-oriented criteria,
- Avoid large-scale clear-felling,
- Avoid harvesting within forests having a high conservation value or are habitats to critically endangered species.
- Observe the rights of indigenous peoples and traditional land use rights.

The Forest Stewardship Council (FSC) is an international organization representing the interest of the Forestry Industry. It has produced 10 principles to guide the industry forward in a sustainable manner (ITTO, 2005).

**Principle 1: Compliance with laws and FSC principles**
Forest management shall respect all applicable laws of the country in which they operate as well as international treaties and agreements to which the country is a signatory, and shall comply with all FSC Principles and Criteria.

**Principle 2: Tenure claims, land use rights and responsibilities**
Long-term tenure claims and use rights for land and forest resources shall be clearly defined, documented and legally established.

**Principle 3: Indigenous peoples’ rights**
The legal and customary rights of indigenous peoples to own, use and manage their lands, territories and resources shall be recognised and respected.

**Principle 4: Community relations and workers’ rights**
Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.

**Principle 5: Benefits from the forest**
Forest management operations shall encourage the efficient use of the forest’s multiple products and services to ensure economic viability and a wide range of environmental and
social benefits.

**Principle 6: Environmental impact**
Forest management shall conserve biological diversity and its associated values, water resources, soils and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.

**Principle 7: Management plan**
A management plan appropriate to the scale and intensity of the operations shall be written, implemented and kept up-to-date. The long-term objectives of management and the means of achieving them shall be clearly stated.

**Principle 8: Monitoring and assessment**
Monitoring shall be conducted, appropriate to the scale and intensity of the forest management, to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

**Principle 9: Maintenance of high conservation value forests**
Management activities in high conservation value forests shall maintain or enhance the attributes that define such forests. Decisions regarding high value forests shall always be considered in the context of a precautionary approach.

**Principle 10: Plantations**
Plantations shall be managed in accordance with Principles 1 - 9 above. While plantations can provide an array of social and economic benefits and can contribute to satisfying the world’s needs for forest products, they should complement the management of, reduce pressures on and promote the restoration and conservation of natural forests.

**Guidelines for Assessment**
Operators working within a forest concession granted within a PA should have an operational plan and a management plan. The guidelines assume that such is the case and therefore the concentration is on meeting the standards that would allow the DoE to issue a development permit for the propose timber operation. The guidelines below assume the investment would involve timber extraction (with some level of processing) with enrichment planting and silvicultural treatment since it is quite unlikely that a permit would be given for a forest plantation within Belizean PAs, although this would be quite possible within the buffer zone region.

**Maps of the concession area** – The proponent should be able provide the following information about his concession area using maps on a scale of 1:25000 where appropriate:

- Vegetation types of the area covered by the plan;
- Areas selected for timber harvesting and areas to be excluded from silvicultural activities;
• Approximate boundaries and size of the annual coupes;
• Estimated standing and harvestable volume in each coupe;
• Approximate road location for main transportation routes;
• Extraction techniques to be used; and
• Special conservation measures to be applied.

Requirement for Reduce Impact Logging - The operator should aim to reduce environmental impact through the practice of Reduce Impact Logging (RIL). This will help to reduce impact to the following:

• Reduce disturbances to soil and residual vegetation when compared to conventional logging operations
• Limit overall direct impacts and collateral damage to the forest
• Conserve wildlife and other forest resources, including non-timber forest products (NTFPs), threatened and endangered species, keystone plant resources, and water
• Protect the long-term integrity and value of the permanent forest estate.

Extraction Methods – The proponent should be required to adhere to the following when abstracting timber depending on the topography.

• Allow ground skidding only in areas where the slopes are below 30%.
• Where the slopes within the extraction coupes mainly range from 30-70%, ground skidding should be prohibited because of the prospect for extensive damage to both soil and vegetation which results under these conditions. The operator should investigate the feasibility of using skyline yarding systems in such areas as an appropriate extraction method.
• Exclude from harvesting areas with slopes greater than 70% and reserve those areas as protection forest.
• Reserve riparian zones and areas of unique forest habitat as conservation forest.

Stock surveys – The proponent should provide detail on the methods to be employed during stock surveys across the annual coupe including the list of species according to the production forest and the method of marking and labeling. In particular the timber operator should note the following:

• Protected tree species: rare, threatened, or endangered species.
• Trees with dbh of 10cm or more known by local people to provide non timber forest products (NTFPs).
• Important wildlife resource trees. A select group of tree species that serve as important food resources for wildlife should be marked (especially important for Spider and Howler Monkeys and Macaw Parrots.
• Roosting and nesting trees used for endangered species such as the Macaw, Jabiru and Harpy Eagles.
Topography assessment - Because the road and skidding trails network will be mainly designed and planned according to the terrain the operator should be required to produce accurate topographic maps showing the slope and layout of the land.

Road, landing, and skid trail planning – The road network should seek to minimize road density while providing access to all harvest areas. Roads and skid trail should avoid conservation areas, buffer strips along streams and steep slopes.

Protected areas – Show areas reserved from harvesting based on the following characteristics:

- **Unworkable areas**: areas that are too steep (> 30% for ground skidding and > 70% for any other logging system), rocky, and/or have very low commercial timber. This area may be classed as conservation area.
- **Cultural areas**: areas that have cultural or religious value for the local residents. Such areas should be defined in consultation with the local population and clearly marked as conservation area on the logging plan maps.
- **Conservation areas**: areas that preserve unique and/or fragile habitats, and areas of high biodiversity. These areas must be representative of the different ecosystems occurring in the concession and can only be defined through an assessment of the wildlife community and its habitat within the cutting block.
- **Stream buffer zones**: areas adjacent to streams (permanent watercourses) where logging activities are not permitted. Streams are considered to be watercourses if they flow for at least 2 months in most years. Stream buffer zones vary in width from 20-200 m according to the size of the watercourse. The Table below shows the buffer zones to be used for varying width of streams.

Waste Management – The proposal should detail the methods for disposal of forest, logging and milling waste. Proposals should show how this waste could be incorporated into useful products or energy.

Total width of stream buffer zones (SBZ) based on stream width

<table>
<thead>
<tr>
<th>SBZ width in metres</th>
<th>Stream width between banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 m</td>
<td>No buffer zone</td>
</tr>
<tr>
<td>1-10 m</td>
<td>20</td>
</tr>
<tr>
<td>11-20 m</td>
<td>50</td>
</tr>
<tr>
<td>21-40 m</td>
<td>80</td>
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5.7.3 Assessment Guidelines for Development in the Agriculture and Fisheries Sector

**Guidelines for the Agricultural Sector**

Agricultural investments in protected areas is virtually nonexistent in Belize at the present time, however it is a major industry in the buffer zones of some of the country’s most important protected areas, especially in the Stann Creek and Toledo districts. Recently an agricultural development within a biological corridor area in Central Belize has raised concerns about biodiversity conservation and stoked heated controversy.

Given the relative abundance of land and stakeholder opposition, it is unlikely that agricultural investments will ever take place in Belizean PAs, however the guidelines below are useful in directing sustainable agricultural practices in buffer zone areas.

1. Proposals for agricultural development should demonstrate/promote the following:
   
   a. Be formulated with a good understanding of the local biophysical and socio-economic and socio-cultural environment.
   
   b. Be formulated within the framework of national or local sustainable development plans.
   
   c. Take into account multiple values (social, economic, agricultural, medicinal, etc.) of biodiversity and its components.
   
   d. Use sustainable agricultural practices/approaches/technologies.
   
   e. Promote the sustainable management and use of biological processes (as agricultural inputs).
   
   f. Encourage a more diverse agricultural ecosystem as a shield against diseases and disasters (natural or man-made) and which can contribute to agro-ecosystem resilience. Such a system can act as a suppressant to pest conditions and greater resistance to invasion of farming systems by noxious species.
   
   g. Conserve genetic resources/diversity, especially agricultural genetic resources/diversity.
   
   h. Reduce top-soil losses from erosion and the reduction in soil fertility/soil life.
   
   i. Induce conservation and efficient use of water through efficient irrigation and use of drought resistant crops.
   
   j. Reduce misuse of agrochemicals, contributing to a reduction of toxic substances in soil and water.
   
   k. Encourage low energy consumption technologies and decrease reliance on non-renewable sources of energy.
   
   l. Promote bioenergy sources such as biogass.
   
   m. Protect critical ecosystems and reduce pressure on protected areas.
n. Promote conservation and sound husbandry of land resources.
o. Promote awareness on the need for mitigation of greenhouse gases and adaptation to climate change.
p. Avoid changes in water quality and supply downstream of the project area.
q. Engrave a good understanding of biologically diverse production systems.
r. Integrate the conservation and sustainable use of biodiversity into farming activities.
s. Identify measures, such as agricultural practices, training, and institutional capacity development to conserve and sustainably use biological diversity.
t. Avoid sensitive areas or critical habitats.
u. Avoid the release of chemical substances or the introduction of biologically modified organisms.
v. Avoid the use of alien species/varieties/breeds for livestock, crop, aquaculture or fishery restocking.
w. Avoid the erosion of local genetic resources, varieties, and species; the degradation of natural and agro-systems, and/or the diminishment of ecosystem functions.
x. Avoid significant changes in land use and water extraction patterns.

2. Livestock and animal husbandry

a. Maintain forested areas and protect wild-life.
b. Preserve local environment, in particular, as regards disease prevention and habitat impacts.
c. Avoid stocking rates exceeding the livestock carrying capacity of land which could result in rangeland degradation.
d. Avoid the introduction of new livestock types that do not fit with local farming systems.
e. Avoid losses of animal genetic resources.
f. Take into account rotational grazing systems or combined animal husbandry.
g. Preserve hilly areas and limit soil erosion and compaction problems, such as near waterways.
h. Avoid unsustainable manure management practices that can result in soil and water contamination.
i. Avoid risk of disease transmission to other animal species, wildlife and to humans.
j. Avoid risk of disease transmission through poor quarantine and trans-boundary movements.

3. Fertilizers
a. Encourage integrated plant nutrition systems by combining mineral fertilizers with organic inputs such as farm yard or green manure.
b. Increase the efficiency of fertilizer use while limiting environmental pollution.
c. Limit fertilizer applications to maximum effective rates taking into account the predominant cropping system, soil conditions, and other intensification factors.
d. Protect critical aquifers or water bodies from fertilizer runoff.
e. Promote use of biological nitrogen fixation or other processes that might reduce fertilizer requirements.
f. Encourage crop rotations that recycle nutrients in crop by-products, particularly from legumes.
g. Avoid the accumulation of excess nutrients in soils, causing the leaching of nutrients into groundwater, and excessive nutrient loading of surface water bodies and wetlands.

4. Pesticides

a. Apply integrated pest management (IPM) techniques and best practices, including use of biological control methods, timing of crop sowing, use of pest-resistant varieties etc.
b. Apply best practice guidelines and standards for safe use and disposal of used pesticides containers and outdated stocks.
c. Protect surface and ground water quality, livestock, human health, fish stock, aquatic habitat and wildlife, in particular where run-off is likely to occur.
d. Promote natural enemies of pests and avoid an increase in pest incidence or creation of new pests.
e. Take into account beneficial soil micro-organisms.
f. Ensure the application of pesticides is well targeted and applied under the right conditions.
g. Limit the intense application of systemic chemical pesticides.
h. Limit handling and application of chemicals by inexperienced workers.

5. Socio-economic dimensions

a. Project should contribute to alleviating poverty for a significant portion of the rural population.
b. Create stable employment or generate new income in agriculture, forestry or fisheries.
c. Create opportunities for payments for environmental services such as protection of forest in watersheds.
d. Encourage participation of women in decision-making that directly or indirectly affects them.

e. Enhance food security in terms of self-reliance and self-sufficiency.


g. Ensure project is designed and implemented with prior consultation, consent and participation of affected populations.

h. Introduce new and/or adapted technologies that are environmentally, economically and socially sound.

i. Introduce preventive measures that reduce degradation of natural resources, protect natural ecosystems and biodiversity, and reduce human risk.

j. Increase local and national understanding and knowledge of sustainable development processes.

k. Improve local management and technical capabilities.

l. Encourage formation of self-reliant local groups and share knowledge with neighbouring farmers.

m. Consider land rights schemes and existing system of land use rights.

n. Include participation of people affected by decision-making process.

o. Diversify and expand productive activities, supply of inputs, markets and self-sufficiency.

p. Protect archaeological sites, structures of historic significance and landscape value.

q. Reflect understanding of benefits of natural systems and potential conflicts with local population.

**Guidelines for the Fisheries Sector**

**The Fisheries Sector and MPAs**

In Belize the fishing industry (including aquaculture) provide an array of valuable services, including food, employment, recreation, export trade and general economic well-being for the population. In view of this, it is quite apparent why such an important industry should be conducted in a responsible and sustainable manner.

Unfortunately much of the fishing resources for favored commercial species are now severely depleted with the sole exception being the marine reserves. The evidence for the success of marine protected areas (MPAs) in protecting and nurturing fish is indisputable. Worldwide 63 percent of MPAs have higher fish densities than outside, 90 percent have higher biomass, 80 percent have a larger mean size of individual fish, and 59 percent have greater taxonomic diversity. The main aim of MPAs is to increase biodiversity or enhance a fisheries resource by removing or reducing exploitation pressure.
The success of Belizean MPAs in replenishing fish stocks is evidence by the fishing pattern of fishermen who fish close to MPA boundaries to benefit from spillover of animals from reserves. During recent visits to MPAs, the staff confirmed from their research that MPAs had more abundant densities of fish in all size classes including commercial classes than non-protected areas.

MPAs provide protection for critical marine areas and often provide a spatial escape for intensely exploited species. They protect vital breeding and nursery grounds for important species at critical life history stage when they are particularly vulnerable and easy to exploit. MPAs also protect important spawning aggregation sites in the country. These predictable aggregations are easy targets for fishermen, hence protection is vital, particularly if the species is subjected to heavy commercial fishing pressure like the Nassau grouper (Epinephelus striatus).

MPAs are often associated with increases in spawning stock size, animal body size, and reproductive output of exploited species. MPAs augment catches through export of offspring to fishing grounds, and spillover of juveniles and adults from reserves to fisheries.

In summary, Belizean MPAs support the country’s fishing industry in the following ways:

- Protect vulnerable target species from extinction;
- Protect critical stages of the life cycle of key resources, potentially enhancing spawning biomass and reproduction;
- Protect critical habitats (e.g. coral reefs, algal or seagrass beds) from irreversible degradation due to fishing;
- Provide a buffer against future uncertainty and maintenance of 'reservoirs' of spawning biomass, improved survival of offspring, and maintenance of ecosystem functions;
- Serving as a reference point for improving knowledge of the fisheries ecosystems by providing an example of an untouched ecosystem for comparison;
- improving social and economic conditions of fisheries by maintaining biodiversity, improving biomass and yield, and offering opportunities for alternative employment to fishermen especially in the off season (e.g. those who work in tourism sector).

Allowing fishing in one form or another is now widely accepted as a viable and potentially sustainable approach to the management of MPAs. Not only does it support community livelihoods and the commercial value of the national fishing industry but it also helps to garner community support for MPAs.

In Belize, most marine protected areas are zoned and allow some form of multiple uses including fishing. MPA zoning is a flexible tool encompassing a range of management options ranging from strictly protected no-take zones to multiple use areas where different
activities are carefully managed. At its heart is the requirement for surveillance, sanction and control which is required for the system to work effectively.

In all cases fishermen are restricted in the way they are allowed to carry out their fishing activities in the zones that allow fishing. These restrictions include who can fish (traditional fisherfolk vs other fishermen) the type of fishing allowed, the species taken, the time period in which fishing for certain species is allowed, the size classes that may be taken and the collection methods e.g. using fishing lines as opposed to spears and nets. This needs to be enforced by strengthening the control capacity of the relevant authorities.

Fishing in MPAs shifts the paradigm from common property fisheries (characterized by a lack of property rights and economic over-exploitation) to exclusive use right on the part of fishers who are prepared to abide by the rules. This has created a sense of ownership and responsibility for the management of the resource among the fishermen.

Despite this, although the use of reserves to achieve biodiversity and ecosystem conservation goals is widely accepted, there still exist a good deal of mistrust and apprehension between fisherfolks and the MPAs’ management authorities as was evidenced in the recent consultations. This void needs to be addressed using a constructive approach.

Relying on simplistic solutions to address marine conservation problems risks polarizing stakeholders (especially fishermen). This can ultimately threaten the goal of marine conservation.

**Guidelines for the Fisheries sector**

Marine protected areas should not result in the ejection of existing residents or users from the area nor forbid, on principle, existing and future uses of the resources within their boundaries. Besides the fishing sector MPAs have economic value to a number of commercial sectors including tourism hence the pressure to invest in some areas can be high.

There is a high demand to device management mechanisms in MPAs that will create the balance between conservation and long-term productivity on the one hand and provision of livelihood benefits and economic development on the other. The advocacy of empirically unsubstantiated rules of thumb in marine protection creates potentially dangerous targets for resource conservation. EIAs covering the fisheries sector and its interactions with MPAs should not be considered in terms of restrictions and regulations, but as a tool that can improve the design of projects.

1. The assessment should include a description of the main characteristics of the production processes such as expected type and quantity of fish to be caught and expected methods for capturing fish.
2. The assessment should clearly show the design and size or scale of the development.
3. There should be some indication of the effects to the physical presence of the completed development within the receiving environment.
4. The area taken up by the enterprise should be defined and clearly shown on a map. The environment expected to be affected by the development should be delimited with the aid of a suitable scale map.
5. The uses to which the development will be put should be described and the different management areas (zones) demarcated.
6. The assessment should show the types and quantities of waste matter, energy and residual materials to be produced and the rates at which they will be produced.
7. The ways in which it is proposed to handle and/or treat these wastes should be indicated, together with the routes by which they will eventually be disposed of to the environment. This should be shown using Diagrams, plans or maps.
8. The assessment should give an estimate, by type and quantity, of expected residues and emissions resulting from the operation of the proposed project.
9. The main alternatives considered by the Developer and an indication of the main reasons for the particular choice made, taking into account the environmental effects.
10. A description of the aspects of the environment likely to be significantly affected by the proposed project, including fauna, flora, soil and water, but also local population, landscape, national and regional PAs, and any other aspect that may be significantly impacted.
11. A description of the likely significant effects of the proposed project on the environment resulting from:
   a. The existence of the project,
   b. The use of natural resources,
   c. The emission of pollutants, the creation of nuisances and the elimination of waste.
12. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
13. Evidence of consultation to elicit the views of consultees throughout the process including during the screening and scoping phases,
14. Arrangements should be made to collect the opinions and concerns of relevant agencies, special interest groups, and the general public. This should normally be accomplished through the use of public meetings, discussion groups etc.
15. Evidence that the project is following the ecosystem approach which reflects the diverse and dynamic nature of marine ecosystems.
16. Show evidence used in data collection and analysis. It is difficult to make effective management decisions in the absence of good, usable data.

17. Evidence of collaboration between fishermen, PA managers and researchers.

18. The project should take account of the principles of precautionary management since flexibility and dynamic management practices are needed to cope with the uncertainty inherent in marine ecosystems.

19. Evidence of how the developer intends to manage competing uses such as tourism through marine spatial planning combined with comprehensive stakeholder engagement.

20. Mechanisms which would allow the temporary or permanent closure of certain sites where biodiversity values are threatened.

21. Evidence of how the Developer intends to reduce the catch of non-target species as a way of maintaining the sustainability of the fishery resource and the maintenance of ecosystem health.

22. The requirements for robust management through vigorous monitoring and enforcement to ensure compliance with sustainable fishery goals and regulations.

23. Methods used to monitor and detect illegal fisheries, which if not detected can seriously compromise the sustainability of the fishery resource.

24. Impact should be investigated and described especially with regard to identifying effects on or effecting human beings; benthic substrates, fauna; water and interactions between these things.

25. The Developer should give a description of the methods used to assess the effects on the environment such as computer modelling and expert advice.

26. The significance of an impact should be assessed, taking into account appropriate national and international quality standards where available.

27. Account should also be taken of the magnitude, location and duration of the impact in conjunction with the national and local societal values and those of the PA.

28. Impacts are not confined to immediate effects. Consideration should be given to effects, which may be; positive or negative; cumulative; short or long term; permanent or temporary; direct or indirect.

5.7.4 Assessment Guidelines for Investments in the Water Sector

Water Resource Users

The major providers of potable water in the country have mixed feelings where investments of water resource projects are concerned. They are of the opinion that the protected areas should be kept pristine and well managed to allow for cleaner water to be extracted and distributed.
One of the major constraints where further investments are concerned has to do with a lack of financing to do further development work in the provision of potable water. In Belize, under the PUC, water providers are regulated under the Water and Waste Water Act and further legislation has been promulgated where water resources are concerned.

In Belize, access to potable water through the main provider and village water boards has increased to almost 90% countrywide. If marine and terrestrial protected areas are to be explored for water investments there is a need to ensure strict guidelines that will protect PA biodiversity and their buffer zone region. There is every belief that the EIA process can help to mitigate against undue harm to protected areas.

Although conservation does not necessarily mean consuming less, it should be appreciated that unregulated investments in fragile ecosystem can be catastrophic. Guidelines must be prepared to steer investors towards a satisfactory outcomes. Belize must therefore, determine and implement investor guidelines to keep a balance between conservation and the need for investments to grow the economy.

At the present time Companies in Belize investing in the water sector do so outside PAs and mostly outside their buffer zones, however the PA system provides a valuable service in protecting the watershed, filtering the water and regulating the flow.

Water Companies include the Belize water Services Ltd which produces almost all the piped water in the country that reaches consumers. Smaller systems are found in remote communities. There is a lively trade in bottled water, however this water comes primarily from wells and rivers outside protected areas. In addition to this, the agriculture sector uses some water for irrigation but considering the very few instances where irrigation is practiced in Belize the amounts used is minuscule.

The water sector does not currently make any investments in PAs however this may change in the future if laws allowing Payment for Environmental Services are ever enacted.

1. Reflect provisions of internationally recognized best practices and national or trans-boundary water management plans.
2. Preserve habitat for wildlife or fisheries.
3. Avoid proliferation of water weeds, and protect riparian vegetation.
4. Avoid flooding of land suitable for agriculture or create adverse effects in human settlements.
5. Protect watersheds and water quality within or adjacent to the project area.
6. Avoid changes in water quality and supply downstream of the project area.
7. Avoid land tenure disputes and water use conflicts.
8. Limit erosion in watershed area and in intakes, waterways and reservoirs.
9. Reduce downstream flow can impair aquatic life or endanger the supply of water to wetlands.
10. Avoid water-borne disease hazards or health hazards to local or downstream populations.
11. Provide flood warning and protection and avoidance of flood hazards.
12. Avoid soil salinity or land subsidence.
13. Preserve surface water hydrology, surface water quality and water resources adjacent to project area.
14. Protect commercial fisheries or aquaculture.

5.7.5 Assessment Guidelines for Development in the Energy Sector

Energy Sector in Belize

Belize is faced with the challenge of high energy costs and fossil fuel dependence, high energy imports, increasing environmental impacts, inadequate energy policies, antiquated infrastructure and technologies, outdated production approaches, scarce qualified workforce and inadequate energy data. The energy sector is one of the major sources of government revenue (e.g., fuel taxes, license fees and royalties). Roughly 75% of total energy demand is supplied through foreign sources.

The country’s Belize’s primary energy sources comprise 66% fossil fuel (imported), 26% biomass (traditional biomass and bagasse), 5% Electricity (imported), and 3% Hydro. Wind and solar energy represent a negligible 0.03% of all primary energy sources. These percentages have not changed significantly over the last 10 years. Belize has developed its Energy Policy to address the issue of energy governance.

Energy Generation in Protected Areas

Energy demand is expected to increase substantially over the next decade. Options to address this demand will need to meet environmental, equity and economic imperatives. Increasingly, conventional energy projects are meeting public resistance because of their potentially damaging environmental effects.

Implications for protected areas of increasing energy demand

Increasing energy demand has direct implications for protected areas and the environment. Hydro-power has the potential to be a sustainable and environmentally benign energy source and government may need to consider small scale decentralized schemes. Inevitably, schemes would need to be sited in watersheds, located within protected areas. In addition to this, transmission lines often need to be routed through protected areas.

Power plants running on fossil fuels can also have implications for protected and environmentally sensitive areas. Energy conservation reduces pressure on biodiversity and protected areas.

Reducing the negative environmental effects of energy development
It is vital that Belize meet increased energy demands, but in a way which minimizes negative environmental impacts. Otherwise, energy projects create indirect costs by adversely affecting other development sectors including fisheries, tourism and water resources.

**Public participation in energy development planning**

Increasingly, the Belizean public expects to be consulted regarding the construction of large-scale developments that impact on their environment and livelihoods. Genuine and transparent public hearings could help to defuse public opposition to energy development projects which will inevitably be required in the future.

**Getting energy facilities to pay for the ecosystem services they receive**

Many energy schemes depend on ecosystem services and products to operate. For example, fossil fuel plants are often water cooled and use natural water bodies to release heated effluent, and hydro-power requires water and well protected watersheds to function. Yet, those natural services and products are freely provided often at considerable costs to the PAs, other sectors and communities.

**Energy conservation**

While government has already taken steps to encourage energy conservation, significant potential remains to continue reducing energy demands by implementing a range of conservation measures. Low-cost loans and subsidies to industry and the public to promote investment in energy saving technologies should be considered. For example, economic incentives are needed for solar water heating and energy conservation measures for buildings such as efficient insulation and double-glazing.

**Research on the relationship between protected areas and alternative energy sources**

There is considerable scope for developing environmentally friendly alternative energy sources in Belize and protected areas have a key role to play in providing the context for their development and management. Some research has already been conducted regarding site suitability for wind farms, and solar photoelectric power production. There is also potential for generating electricity from tidal flows.

Initially the government would need to allocate funds for research, and provide tax incentives and cost subsidies for both developers and technology end-users to stimulate the alternative energy industry. The use and establishment of special development zones for this purpose needs to be explored.

**Guidelines for the Energy Sector**

Energy sector can refer to power generation and transmission. Power generation covers a wide and diverse array of sources and includes both conventional power sources (e.g. coal and gas) and renewable sources (e.g. Hydro and solar). The guidelines cannot hope to cover
all the various scenarios of energy generation in PAs and their buffer areas but give good practices that would generally apply to most schemes.

**Physical Environment**

1. Energy proposals having potential to affect protected areas should be subject to Environmental Impact Assessment before they are adopted, and the results should be taken into account in the decision-making process. In instances where an energy project is permitted, the proponent should be required to plan and carry it out in close consultation with PA authorities to minimize adverse effects and to allow the proponent to take preventive and remedial action.

2. Identify applicable environmental standards, norms, and requirements set forth at the international, national, regional and/or local levels including those designed to meet the objectives of resource management and/or land use plans that may be in effect in and around the jurisdiction(s) in which it is propose to develop the project and in which the proposed project might have a potential impact. In the absence of such standards, identify a set of benchmarks that can be used in the analysis.

3. Present all relevant plans related to the proposed energy project, for example, engineering and site preparation plans, operations and decommissioning/closure, environmental management, and mitigation in whatever form these may take.

4. Describe all phases of the project from feasibility studies to site preparation to operations to closure and also plans to expand capacity at the current or adjacent sites.

5. Investigate alternative approaches to meeting the purpose and need for the proposed energy project. This would include alternative fuels (including renewable fuels), siting, designing, constructing, operating and closing the project firstly to avoid and prevent, or secondly to reduce or minimize adverse impacts or improve beneficial environmental or socioeconomic impacts.

6. Assess, as appropriate, the impacts of a range of reasonable and technically feasible alternatives as well as the proposed project. The alternatives to the project must include a “no action” alternative, indicating what would happen in the absence of the proposed project as well as consideration of best practices that may not otherwise have been incorporated in the proposed project. Other alternatives should be developed as needed to address significant issues with the proposal.

7. The assessment should report on the direct, indirect and cumulative impacts and their significance level. The assessment of cumulative impacts is very important in large scale energy projects.
Geology and Soils

8. The assessment document should provide detail information on the geology, soils and topography at the power plant site and along the transmission route. The information should be presented in narrative and tabular form, cross-sections, and on maps. Where information is lacking or unreliable the assessor should carry out a site specific soil survey and boring test.

9. Some energy generation projects are very sensitive to seismic activity. Data should be provided on seismic zone determination, frequency and intensity of earthquakes and tremors, maximum credible earthquake, and maximum probable earthquake data. This proviso applies particularly for projects that include large structures, fuel storage, impoundment dams, canals and penstocks.

Surface Water

10. The assessment should include an evaluation of surface water resources in the direct vicinity of the project. This should include the analysis of the watershed characteristics including water quality, flow characteristics, drainage patterns, soils and vegetation. This information should be shown on topographic maps which should include all surface water resources and floodplains in the area of influence overlaid with the proposed project facilities.

11. The assessment should show all nearby rivers, streams, wetlands, lakes and other water bodies and detail their current uses. Data from historical sources should be compiled on the following:
   - Average daily, monthly and annual flows in cubic meters per second (m3/s)
   - Maximum monthly flows in m3/s
   - Minimum monthly flow in m3/s
   - Seasonal fluctuations in area and volume of wetlands, lakes and reservoirs

12. The EIA should develop and present baseline surface water quality monitoring data which should be conducted over at least a year and be based on a sampling and analysis plan. This data should be collected prior to any project disturbance within the PA and the area of influence, which should be collected prior to disturbance.

   For hydroelectric projects or projects that will have significant wastewater discharges, including thermal discharges, this data should be augmented by the results of a surface water quality monitoring program conducted at specific sites in the project area.

Ground Water

13. Some energy projects have the potential to impact ground water quality far more than others. Hydroelectric projects and the storage of fuel at thermal/combustion plants are examples of energy projects that can affect ground water quality. For such projects, all
wells and springs within the project area should be mapped and information provided on their flows, water levels and uses.

14. The EIA should develop and present baseline water monitoring data which should be collected before any project development begins. All existing data on quantity and quality of water from springs and wells in the vicinity of the project should be collected to help define the baseline.

**Air Quality**

15. Energy projects relying on fuel combustion (fossil fuel and biomass) can have significant effects on air quality. Because of this, the collection of baseline air quality data is critical for combustion powered facilities as it will be used to assess air quality impacts from stack emissions.

16. For combustion powered plants the air pollutants of primary concern will be particulate matter (PM), sulfur dioxide (SO2), oxides of nitrogen (NOX), carbon monoxide (CO) and greenhouse gas emissions (primarily as CO2, nitric oxide [N2O] and methane [CH4]).

17. The assessment and monitoring of air quality should be conducted, both upwind and downwind of the facility. Monitoring should include the use of high volume samplers and/or other methods to collect samples of air borne particulates and gases that may be emitted from the facility.

**Noise and Vibration**

18. Noise measurements must be taken if significant noise will be produced and there are receptors. If receptors are present, baseline noise measurements should be taken at representative points of reception prior to start of construction and reported within the environmental impact assessment report.

19. Particular attention must be made to ensure noise measurements around sensitive habitats and areas of human habitation such as schools, residential neighbourhoods etc.

20. Noise monitoring programs should be sufficient for statistical analysis and should cover a 48 hour period or differing time periods over several days, including weekday and weekend.

21. Noise monitoring should be carried out using a Type 1 or 2 sound level meter meeting all appropriate international quality and accuracy standards and placed approximately 1.5 meters above the ground.

**Landscape Values**

22. The assessment should include baseline information on views and valued vistas that could be impacted by the proposed project such as mountains, lakes and rivers, cultural, archaeological, and historical structures.
23. The location of these views and vistas can be documented by presenting panoramic views (including photos) of them from potential viewpoints such as, roads, residential areas and designated scenic viewing areas.

24. The existing condition must be compared to the views after the project with the facilities installed. This should be superimposed on the existing views.

**Biological Environment**

For developers tasked with undertaking EIAs for development projects in the energy sector that can impact PAs and their buffer zone, the primary pathways for impacts on the biological environment are contamination of soil, water and air and alteration of flow in surface water and flooding of ecosystems. In addition, land use conversions and increased human activity brought about by the project are important considerations which must be taken into account.

Important impacts can include destruction, modification or fragmentation of habitat, disruption of wildlife behavior, including feeding, migration, breeding and nesting. Other important impacts associated with energy schemes include contamination/pollution of habitats, electrocution, wildfires, light pollution and increase accessibility for hunters and loggers. For some energy generation schemes, impacts on aquatic ecosystems can be caused directly from changes in water quantity and quality.

The assessment should start with a proper identification of the ecosystems. The EIA preparer should produce maps showing all ecosystems, key species locations, protected areas, migration corridors and areas subjected to seasonal use for mating, nesting, etc. The timing of such seasonal use for nesting breeding migration etc should be documented for all species that could be affected by the energy project activities.

In addition to this, the assessment should determine the ecological characteristics of the project area along the following themes:

- Size of the various habitats
- Present condition of each habitat and its conservation value
- Species/habitat richness
- Vulnerability of the identified ecosystems
- Population size for species of conservation concern

**Flora**

25. The assessors should conduct a baseline inventory of representative flora within the project area with particular emphasis on the project boundaries. In Belize there is an ecosystem maps covering the entire country, however many of these broad ecosystems have microhabitats and ecosystems which the maps do not show, therefore the results of the inventory should be presented as vegetative maps of the area.
26. The assessment should identify endemic species, keystone species, migratory species and species that may be threatened or endangered.

27. Emphasis should be placed on assessment of wetlands since they are often the recipient of land based pollution in their role as filterers for waterborne sediments that pass through them.

28. Use biodiversity offsets to compensate for forest loss as a result of flooding in impoundment areas, the construction of roads and ancillary facilities.

**Fauna**

29. Land clearing for energy generation facilities and the creation of access roads and right-of-ways can cause destruction and/or fragmentation of terrestrial ecosystems which can impact wildlife. The creation of water impoundments flood ecosystems and reshapes habitats as has happened at the Chalillo site.

30. The construction of access roads and clearing of right-of-ways can fragment existing ecosystems and interrupt migratory corridors. This is especially detrimental to obligate arboreal species. On the other hand, the clearings can favour certain wildlife species such as ungulates which use the clearing as rich foraging habitats and predators which travel along them.

31. Access roads and right-of-ways create opportunities for increased human intrusion for the collection or harvesting of plants and hunting of animals.

32. Light pollution can disorient animals on their migratory routes and disrupt the natural diurnal patterns of light and dark.

33. Transmission towers and transmission line can pose a hazard to birds and bats at night through collisions and electrocutions. The impacts are especially severe when these structures fall within migration corridors or along established flight paths.

34. At the present time Belize does not have commercial wind turbines, however if they are ever introduced they pose a potential hazard to birds and bats due to collision with turbine blades.

35. Dams block movement of species from downstream of the dam to upstream of the dam. The study of migration of fish species along Belize’s rivers and creeks is not well established; however this can be an important consideration if migratory fish are in the river.

36. Other impacts to aquatic species and ecosystems include:
   - Water contamination,
   - Changes in water flows or water levels in surface water,
   - Direct aquatic habitat alteration e.g stream bed scouring,
• Injury or mortality from in steam water technologies (e.g. rotating turbines) and habitat avoidance due to environmental disturbance.

Socio-economic and Cultural
Socioeconomic impacts from power generation and/or transmission projects depend on the project type and size as well as the project footprint and energy source, existing land use practices and location of local population centers relative to the project area. Other variables can arise from the stage in the development of the project e.g. project preparation, construction, operation and decommissioning.

37. Public/Stakeholder concerns related to impacts in and around the proposed project and alternatives at least for stakeholders within the geographic scope of potential impact. The project proponent should document specific steps taken to engage the public and other stakeholders.

Concerned public include: Local governments, persons living and working in the vicinity of the project, those with interests in resources that may be affected i.e., indigenous peoples, and those concerned about protected areas and prime agricultural lands. A summary of public outreach activities, audience, number of persons, organizations involved, concerns raised, responses to comments and actual copies of written comments.

38. Many of the impacts from energy infrastructure projects are positive such as employment opportunities and increase demand for local goods and services as well as the potential to access the power generated. These should be reported upon in the assessment.

39. The assessment should report on negative impacts arising from the development. These could potentially include the following, depending on the type of project and development phase:
   a. Displacement and relocation of current settlements, residents or community resources,
   b. Displacement or disruption of people’s livelihoods (e.g. tourism and recreation),
   c. Increased demand for services such as education, security (police), water, sanitation and health care,
   d. Increase demand for infrastructure such as roads which may necessitate additional investments to cope,
   e. Reduction in quality of life for residents from visual and noise impacts,
   f. Impacts on public health for some schemes such as air quality deterioration,
   g. Impacts on worker health and safety.

40. Large energy projects may impact Belize’s cultural heritage with the most recent case being the Chalillo Upstream Storage Facility where several sites along the Macal River
Examples of adverse effects to cultural and historical resources from energy projects may include:

- Destruction during construction
- Damage and alteration
- Removal from historic location

**Land Use**

41. Large energy projects can have significant land use changes with the most dramatic example being hydrogenation facilities, biomass projects and energy from waste plants. In addition these projects are almost always associated with new access roads and transmission lines increasing their footprint.

42. Projects can impact land use on adjacent properties as well as properties through which roads and right-of-ways may pass.

43. Changes in land use might be precipitated by changes in visibility, noise, odor, air pollution, and water contamination.

44. Not all land use changes are negative. The impoundment areas precipitated by large dams can create inland lakes used for tourism and recreation and spawn local fishing industries.

5.7.6 **Assessment Guidelines for Development in the Oil and Mineral Sector**

Recently, the petroleum and mining sectors have become increasingly important in the country with the interest driven by high energy cost and the demand for precious metals. Much of the exploration is taking place in protected areas where it is believed the best potential exists. The development of these sectors within protected areas is highly controversial with some believing them to violate the PAs biodiversity and resource protection mandate.

In light of this, it is very important that these projects are managed responsibly and vigorously assessed. The guidelines below should help to instill stakeholder confidence in the assessment process and guide the DoE and its advisors in vetting these projects.

**Relevant Guidelines for the Mining Sector:**

There are 2 main phases to be considered in mining:

1. **Mineral exploration** - A permit is normally required for exploration activities. It permits the holder to take certain actions to determine the existence, quality and quantity of minerals. Normally it will include the following activities:
   - Prospecting;
• Using instruments, vehicles, vessels, machinery and equipment and techniques appropriate to determine the existence of any mineral;
• Sampling and testing of material to determine its mineral bearing capacity or properties of mineralisation; and

2. Mineral development – Normally a Mineral Development Licence entitles the holder to legally undertake the following activities:

• Geological, geophysical and geochemical work necessary to evaluate the potential of any mineral occurrence that has possible economic potential;
• Mining feasibility studies and metallurgical testing;
• Environmental and marketing studies;
• Engineering and design studies;

Both the exploration and mineral development project are environmentally relevant projects and should require environmental authorization especially when they occur within or adjacent to PAs even when they are considered to present a low environmental risk.

Mineral exploration and extraction involves a significant degree of land use change and is one of the prime sectors in which to apply Strategic Environmental Assessment.

The following are guidelines which relevant Belizean Statutory Authorities and permitting agencies need to take into account when evaluating mining projects.

**Mining Guidelines:**

1. **Mining Area** - The mining activities should be constrained in area. An area of not more than 10ha of any land should be approved for significant mining disturbance at any one time. To minimize impacts the following should be observed;
   a. Avoid disturbing large and/or mature trees and if possible leave rootstock intact.
   b. Do not carry out mining activities in an Environmentally Sensitive Area;

2. **Financial security** - The holder of the environmental permit must submit the required Financial Assurance to the permitting agency prior to carrying out any mining activity. The financial assurance will consist of two components:
   a. An amount to cover the potential costs of rehabilitation of areas disturbed by mining activities and
   b. An amount to cover the potential costs of restoring land and property disturbed by mining activities and/or the failure of the tenure holder to pay rents and royalties to the Geology Department of Belize.

3. **Air Quality** – Mining can generate a lot of dust from the use of heavy duty wheeled and tracked vehicle and the removal of dirt. Although there are few people living
within the vast majority of PAs, the permit holder should still minimize the creation of unreasonable amounts of dust by taking the following (or similar) measures:

a. If possible alter work practices to avoid or minimize the generation of dust;
b. Scheduling activities for times when they have least impact;
c. Spray water to suppress dust on roads and tracks;
d. Re-vegetate disturbed areas as soon as practicable;
e. Leave or creating wind breaks or screening and install filters on dust generating equipment.

4. **Noise** – Mining equipment generate a lot of noise. This can be detrimental in a noise sensitive area such as a PA. To suppress noise levels, the following (or similar measures) should be applied:

a. Construct and maintain noise barriers and enclosures around noisy equipment or along the noise transmission path;
b. Repair or replace defective mufflers on vehicles and plant with suitable mufflers;
c. Limit the hours of operation of the project to between the hours of 7am to 6pm.

5. **Erosion and Sediment Control** - The environmental permit holder must take steps to install and maintain adequate banks and/or diversion drains to minimize the potential for storm water runoff into disturbed areas. He must also design, install and maintain adequate erosion and sediment controls and prevent erosion of disturbed areas and sedimentation of any river, creek pond or lake. Besides this he must regularly undertake the following measures:

a. Regularly clean out sediment traps, ponds and drains and maintain them in effective working order.
b. Ensure that the capacity of sediment traps, ponds, drains and banks are not reduced below 70% of their design capacity.

6. **Topsoil** - To separate topsoil and overburden and to prevent or minimize the erosion of these stockpiles the following measures or similar measures can be used:

a. Separate topsoil and overburden while stripping;
b. Store topsoil and overburden in separate stockpiles;
c. Install silt fences or bunding around the stockpiles;
d. Limit the height of topsoil stockpiles to 2 metres.

7. **Hazardous Contaminant** - The permit holder should ensure that any spills are expeditiously cleaned up. Such spillage must not be cleaned up by hosing, sweeping or otherwise releasing such contaminants to any watercourse, waterway, groundwater, wetland or lake.
The permit holder must dispose of acid producing waste rock in an excavation or pit and backfill with a benign, low permeability material and seal with a compacted capping layer at least 1m thick.

8. **Storage of Chemicals and Dangerous Substances** - The holder of the mining permit must not store chemicals (other than crude oil, natural gas and petroleum products) including ozone depleting substances, gases or dangerous goods in containers with a design storage volume of more than 1000m³ but less than 10m³.

9. **Environmentally Sensitive Areas** - The permit holder must not carry out mining activities in an environmentally sensitive area such as a designated wetland or within 100m of a Historical or Archaeological site.

10. **Roads and Tracks** - The permit holder must consult with the PA manager (or private land owner) and the Ministry of Works prior to establishing any new roads and tracks. When constructing new roads the following guidelines (or similar) must be followed:

   a. All roads must be built to relevant technical and engineering specifications,
   b. Ensure that the affected area and duration of disturbance to land, vegetation and watercourses is minimized.
   c. Wherever possible use or upgrade existing roads and tracks;
   d. Construct roads and tracks along natural grades and minimise the width of roads and tracks;
   e. Minimise the number of crossings in riverine areas and where crossings cannot be avoided construct crossing in a stable section of the watercourse bed;
   f. Do not construct roads or tracks that run straight down the bank to the crossing;
   g. Construct a causeway, a culvert or a bridge where natural bed conditions within a watercourse will not carry the intended traffic load or where crossing of the bed will generate a significant increase in turbidity;
   h. Position cuts and fills in riverine areas to minimise risk of erosion from subsequent flood events;
   i. Regularly clean out culverts, bridges and causeways to prevent flow being impeded or redirected; and
   j. Repair all damage to existing private roads and tracks resulting from mining activities, so that they are as trafficable as they were prior to any damage.
   k. Use biodiversity offsets to compensate for forest loss in road building.

11. **Mining Camps** - When establishing and maintaining mining camps to house and upkeep workers the following (or similar) measures should be used to minimize the area and duration of disturbance to land, vegetation and watercourses:

   a. Locate camp at least 100m from any riverine areas;
b. Only disturb the minimum area necessary for the campsite;
c. Install appropriate human waste disposal facility (e.g. portable self-contained toilets, pit toilets, septic tanks);
d. Use absorption trenches, transpiration beds or spray irrigation to dispose of grey water; and
e. Locate all waste disposal sites at least 100m distance from any watercourse, waterway, groundwater recharge area, wetland or lake.

12. Waste management – Waste must not be released directly or indirectly from the project area to any watercourse, waterway, groundwater, wetland or lake. When managing waste materials the following strategy should be adopted:

a. Reduce waste creation by planning ahead;
b. Reuse and recycle waste materials;
c. Where possible investigate the possibility of creating energy from waste;
d. Provide adequately labelled waste containers on site for the different types of waste;
e. Burying of general waste onsite will only be allowed in IUCN category VI PAs or their equivalent in Belize, however disposal outside the site to a sanitary landfill site is always the preferred option;
f. The contractor should only be allowed to bury up to 50 tons of general waste per year;
g. The waste pit should be located so as to ensure that the waste will not contaminate any watercourse, waterway, groundwater, wetland or lake;
h. Stormwater should be diverted from entering the waste pit;
i. Secure the waste pit and protect from scavengers;
j. Backfill the pit when the level of rubbish is not less than 1m below the surface and sufficiently overfill the pit to allow for settlement.

13. Wastewater Management - The permit holder must not directly or indirectly release wastewater to any watercourse, waterway, groundwater, wetland or lake. Wastewater can be discarded as follows:

a. Where practical recycle all waste water (e.g. recycle waste water for drilling water);
b. Use wastewater for dust suppression;
c. Discharge waste water onto benign overburden or waste rock heaps for absorption; and
d. Discharge wastewater to an evaporation pond.

14. Protection of Surface Water – Buffer zones must be left around surface water supplies and these should be respected. The table below shows accepted buffer distances from work areas to surface water locations.
<table>
<thead>
<tr>
<th>Body of Water</th>
<th>Width of Buffer Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake Pond/Lake</td>
<td>150 meters</td>
</tr>
<tr>
<td>River Intake</td>
<td>150 meters for a distance of 1 kilometer upstream and 100 meters downstream</td>
</tr>
<tr>
<td>Main River Channel</td>
<td>75 meters</td>
</tr>
<tr>
<td>Main Tributaries/lakes/ponds</td>
<td>50 meters</td>
</tr>
<tr>
<td>Other bodies of water</td>
<td>30 meters</td>
</tr>
</tbody>
</table>

15. **Protection of groundwater** - The permit holder must isolate aquifers where an exploratory drill hole intersects more than one water bearing strata by casing or plugging the hole as soon as practical after the hole is no longer required apart from those holes that are still required for monitoring purposes if:

a. The flow difference between aquifers exceeds 500 L/hour; and  
b. The difference in electrical conductivity of water is greater than 10% of the lower value.  
c. If the land owner/PA manager and the permit holder have agreed that the well should be left for conversion to a water bore, the hole should be temporarily capped to prevent possible ingress of surface waters and associated sediments and pollutants.

16. **Service, Maintenance and Storage Areas** – The permit holder must work to prevent direct or indirect release of fuels, lubricants or other contaminants into any watercourse, waterway, groundwater, wetland or lake. He is therefore expected to employ the following (or similar) measures:

a. Maintain all refuelling equipment in good working order;  
b. Use groundsheets or drip trays to capture spillage during maintenance of machinery and vehicles;  
c. Locate all fuel storages within an impermeable bund;  
d. Ensure all liquid containment, including fuel tank bunds and process water ponds, have a volume at least equal to the design volume plus an additional 10% of that volume; and  
e. To the extent possible, undertake all refuelling and routine maintenance of vehicles within designated service areas.

17. **Chemical, fuel and oil storage facilities** - The permit holder must ensure that:

a. All chemical, fuel and oil storage facilities on a mining tenement, must be designed and operated in accordance with applicable Belizean standards for the
storage and handling of flammable and combustible liquids and where these do not exist to follow best practice international standards.

b. All chemical, fuel and oil storage facilities up to 10,000 L on a mining tenement, must be bunded to contain at least one hundred percent of the volume of the largest container, plus twenty-five percent of the storage capacity of the largest container up to a maximum of 10,000 L.

c. All chemical, fuel and oil storage facilities over 10,000 L capacity on a mining tenement, must be bunded as in (b) above together with ten percent of the storage capacity beyond 10,000 L.

d. Fuels stored within sensitive areas such as protected areas, domestic water supply areas, sensitive wildlife areas, ecological reserves, archaeological sites, should have dyking of fuel caches when:
   i. size of storage is 100 drums or more
   ii. the duration of storage is permanent

e. Dykes should be built of clay or other impermeable materials,

f. A fuel/oil spill clean-up kit must be kept on site within the protected area to facilitate any clean up in the event of a spill. For small storage the kit should include absorbent pads, loose absorbent materials such as sawdust and a container such as an empty drum for recovering the fuel/oil.

g. If there is a bulk fuel storage facility within the protected area, the clean-up kit must include the following:
   i. Fire pump and 100 meters of hose;
   ii. Two hand operated fuel pumps;
   iii. Six recovery containers such as empty drums;
   iv. Four long handled shovels and two pick axes;
   v. Fifteen cubic metres of impervious soil such as clay
   vi. Ten metres of containment boom,
   vii. Twenty-five absorbent pads; and
   viii. One 120-kilogram of loose absorbent material such as dried sawdust.

18. Drilling excavating and sampling - When drilling, excavating or sampling, the permit holder must ensure that the area and duration of disturbance to land and vegetation is minimized. The permit holder should consider the following:

a. Consider seasonal influences, such as the rainy season (June to December) before excavating or establishing a drill site;

b. Construct drill pads no larger than necessary to safely accommodate the drilling rigs ancillary equipment and personnel;

c. Use excavators or backhoes wherever possible in preference to bulldozers which create more soil disturbances;

d. Use drilling fluids and other process fluids which are non-toxic;
e. Not drill, excavate or clear vegetation in standing waters, wetlands or lakes; or on the sloped banks of a river or stream or within 3m of the top of the bank or 5m of the toe of the bank.

19. **Site Rehabilitation** – On the completion of exploration activity or closure of the mine the permit holder must carry out the following:

   a. Complete the rehabilitation of all areas disturbed by mining as soon as practical and prior to the onset of the rainy season.
   
   b. Backfill all excavations, drill holes or sampling sites as soon as practical following the completion of exploration activities except if otherwise agreed with the PA manager or land owner.
   
   c. Rehabilitate areas disturbed by mining activities to a stable landform similar to that of surrounding undisturbed areas.
   
   d. Before revegetating, ensure that the following measures are implemented.
      
      i. Break up compacted soil surface to a depth that is suitable for establishing vegetation,
      
      ii. Spread stockpiled topsoil over disturbed areas to a depth suitable as a rooting medium and provide suitable nutrient booster conditions by using fertilizer if necessary,
      
      iii. Plant native species endemic to the area and location in the landscape,
      
      iv. If there is a serious threat of erosion in disturbed areas plant sterile short lived species with the long term aim of establishing a stable vegetation community similar to that of the surrounding undisturbed areas.
      
   e. Spread seeds or plant species that will promote vegetation of a similar species to that of the surrounding undisturbed vegetation to provide erosion control and stabilization of the disturbed areas.
   
   f. Complete rehabilitation of disturbed areas to the satisfaction of Belize’s statutory authorities and permitting agencies.

**Relevant Guidelines for the Petroleum Sector:**

There are 3 main phases to be considered in petroleum projects. These are:

1. **Seismic Phase** – During this phase the PSA Holder tries to identify the most promising sites for drilling,

2. **Drilling Phase** – This phase is centred around the drilling of deep holes to confirm petroleum deposits,
3. Production Phase – In this phase the PSA Holder begins extraction of petroleum on a commercial scale.

**Main Sources of Impacts and General Considerations**

The guidelines only address onshore projects since at this time drilling in the offshore region has created great controversy. This situation is yet to be resolved.

1. Project footprints typically associated with the various phases are as follows:
   - Exploration and construction footprint may include activities associated with establishment of the seismic lines, well pads, temporary facilities, such as workforce base camps, material storage yards, workshops, access roads, airstrips and helipads, equipment staging areas, and construction material extraction sites (including borrow pits and quarries).
   - Operational footprints may include well pads, permanent processing treatment area, transmission and storage facilities, pipeline right-of-way corridors, access roads, ancillary facilities, communication facilities (Communication towers), and power generation and transmission lines.

2. Impacts may include loss of or damage to, terrestrial habitat, creation of barriers to wildlife movement, soil erosion, disturbance to water bodies including possible sedimentation, the establishment of non-native invasive plant species and visual disturbance. The extent of the disturbance will depend on the activity along with the location and characteristics of the existing vegetation, topographic features and waterways.

3. Forest clearance from the building of access roads will usually be the biggest single cause of environmental impacts in Belize. Road construction may also result in drainage disruption, soil erosion, and increased accessibility into the area for local people resulting in settlements and illegal activities.

4. Wastewaters routinely generated at oil and gas facilities include sewage waters, drainage waters, tank bottom water, equipment and vehicle wash waters, general oily water and non-process industrial wastewater like engine coolant and unused cement slurry.

5. During operations, the main sources of noise and vibration pollution are likely to emanate from flaring and rotating equipment. Noise sources include flares, vents, pumps, compressors, generators, and heaters.

6. Typical non-hazardous and hazardous wastes routinely generated at onshore facilities other than permitted effluents and emissions include general office and packaging wastes, waste oils, paraffins, waxes, oil contaminated rags, hydraulic fluids, used
batteries, empty paint cans, waste chemicals and used chemical containers, used filters, fluorescent tubes, scrap metals, and medical waste, among others.

7. Spills from onshore facilities, including pipelines, can occur due to leaks, equipment failure, accidents or as a result of third party interference (sabotage).

8. The oil company should take into account the possible use of access roads as corridors for people to colonize the area and perpetrate illegal activities. Belizean Authorities should take measures to prevent such activities by putting in manned barriers.

9. For all phases of the project leading up to the early stages of petroleum production, the oil company should appoint an environmental adviser who should ensure that the environmental management and monitoring plan is being implemented and also act as liaison person with statutory and local authority agencies.

10. An environmental audit process should be enforced during the operational phase of the project for continued assessment of environmental performance to ensure that environmental protection management procedures are being rigorously enforced.

11. The commissioning of seismic surveys and other exploration activities should not necessarily mean conflict with conservation objectives.

**SEISMIC SURVEYS**

12. Oil exploration within PAs using remote sensing and aerial geomagnetic survey techniques is unlikely to conflict with environmental interests and is preferred over other means where feasible. Such remotely acquired data may provide useful information for the interpretation of geological structures without the need for extensive on the ground surveys.

13. During seismic surveys in remote areas within PAs the seismic operation should seriously consider the use of helicopters along the seismic lines instead of building roads, although this is an expensive option with many safety issues attached.

14. Preferably seismic lines should be limited to between 1 and 1.5 meters depending on the vegetation type. The lines may be cleared of obstructing vegetation; however the root stock and top soil should be left in place.

15. In protected areas the use of shot holes is preferred to vibroseis since it reduces the width of clearing along the right of way which would be needed for vehicle access.

16. Within PAs, do not use of bulldozers to clear seismic lines and avoid their use to the extent possible when clearing access routes. The preferred method is hand clearing. The circumstances under which bulldozers are used should be strictly controlled.
17. To the extent possible oil exploration companies should be encouraged to plan their seismic work in the dry season to reduce impacts. This suggests working closely with PA managers to work out timelines.

18. If possible site workers camps outside the PA, where this is not possible use appropriately designed facilities to blend in with the local environment.

19. The seismic base camp in PAs should be properly designed and self contained to provide workforce accommodation, canteen facilities, radio room, water supply, vehicle maintenance and parking area, helipad, a bunded area for the storage and handling of fuels, provision for the collection, treatment and disposal of sewage effluent and for the collection and burning of refuse.

20. Special provisions must be made for safe transportation, handling and storage of explosives.

21. All canteen wastes, solid wastes and other putrifiable material should be collected regularly, sorted and segregated and taken out of the PA for proper disposal or recycling.

22. Where package plants are used, sewage and water effluents should be given primary and secondary treatment before disposal. Preferred final disposal should be by deep well injection or sprinkling along perimeter of site away from surface water supplies.

23. The prohibition of hunting, trapping and gathering of forest products by seismic workers should be enforced. Camps should not be supplied with meat from animals killed by seismic workers or food harvested by such workers.

24. Seismic activities sometimes occur in protected areas near to field stations, visitor accommodations and along interpretive trails. The seismic program should endeavour to reduce the impacts of seismic activities in those situations. Possible measures include:

- If possible miss shot holes in sensitive areas or draw line further back;
- Reduce operation times, to the extent practical;
- The charge size and hole depth should be appropriately selected to reduce noise levels from shot holes. Proper back-fill or plugging of holes will also help to reduce noise dispersion;
- If sensitive wildlife species are located in the area, monitor their presence before the onset of noise creating activities, and throughout the seismic program.

25. Survey line waste including line stakes and markers, casings, packaging etc should be collected, removed and disposed of in a responsible manner without impairing soil, water or other resources.
26. At the end of the seismic survey, new access routes, camp sites and seismic lines should be rendered inaccessible to the public. Appropriate methods include breaking up of compacted surfaces to encourage re-vegetation and removal of key bridges specifically installed for the seismic operation.

27. All infrastructure used in surveying should be removed from PA including workers camps etc.

**EXPLORATORY DRILLING**

28. Road construction should be carefully planned to avoid steep slopes and drainage courses. In undulating topography, cut and fill operations should be minimized. Slope engineering is critical and should incorporate preferential drainage courses or culverts, lined with gravel where necessary, to prevent erosion.

29. Exposed soil should be contoured to facilitate natural vegetation or revegetated with indigenous species to speed up the regeneration time. Forest clearing should be kept to the minimum required for safe operation.

30. During well testing, flaring of produced hydrocarbons should be avoided especially near local communities or in environmentally sensitive areas.

31. During exploration drilling, the PSA Holder should have a well-considered and comprehensive oil spill contingency plan.

32. Feasible alternatives should be evaluated for the recovery of hydrocarbon test fluids for transfer to a processing facility or other alternative disposal options.

33. If flaring is the only option available for the disposal of test fluids, only the minimum volume of hydrocarbons required for the test should be allowed and well test durations should be reduced to the minimum extent practicable.

34. Feasible alternatives for the management and disposal of produced water may include injection into the reservoir to enhance oil recovery, and injection into a dedicated disposal well drilled to a suitable receiving subsurface geological formation.

35. Produced water discharges to surface waters or to land should only be considered as a last resort and only outside PAs.

36. To minimize environmental hazards, production chemicals should be selected carefully by taking into account their volume, toxicity, bioavailability, and bioaccumulation potential.

37. Water sourcing for hydro-testing purposes should not adversely affect the water level or flow rate of a natural water body, and the test water withdrawal rate (or volume) should not exceed 10% of the stream flow (or volume) of the water source.
38. Hydrostatic test water quality should be monitored before use and discharge and should be treated to meet the discharge limits. If significant quantities of chemically treated hydrostatic test waters are required to be discharged near a surface water body, water receptors both upstream and downstream of the discharge should be monitored.

39. Separate drainage systems is required for drainage water from process areas (that could be contaminated with oil) and drainage water from non-process areas (open drains). All process areas should be bunded to ensure drainage water flows into the closed drainage system and that uncontrolled contaminated surface run-off is avoided.

40. Drip trays, or other controls, should be used to collect run-off from equipment that is not contained within a bunded area and the contents routed to the closed drainage system.

41. Storm water flow channels and collection ponds installed as part of the open drainage system should be fitted with oil/water separators. Storm water runoff should be treated through oil/water separation system able to achieve oil and grease concentration of 10 milligram per litre (mg/L).

42. Waste materials should be segregated into non-hazardous and hazardous wastes for consideration for re-use, recycling, or disposal. Waste management planning should establish a clear strategy for wastes that will be generated including options for waste elimination, reduction or recycling or treatment and disposal, before any wastes are generated.

43. A waste management plan should be prepared which will document the waste strategy, storage (including facilities and locations) and handling procedures.

44. The operator should have facilities for on-site or off-site biological or physical treatment to render the fluid and cuttings non-hazardous prior to final disposal using established methods.

45. Final disposal routes for the non-hazardous cuttings solid material should be established, and may include use in road construction material, construction fill, or disposal through landfill including landfill cover and capping material where appropriate.

**Base Camp**

46. The base camp should be selected with its anticipated useful life, abandonment, after-use and restoration in mind.

47. Preferably base camps should be located outside of protected areas on level flat land away from water bodies.
48. The PSA Holder should be encouraged to leave large trees within the camp area to minimize damage and soil erosion and to improve camp shading.

49. The drilling phase base camp should be self-contained and may provide workforce accommodation, canteen facilities, radio room, surplus and scrap material handling, vehicle maintenance and parking area, helipad and finally bunded areas for the storage and handling of fuels. In addition there should be onsite provision for the collection, treatment and disposal of sewage effluent, and for the collection and sorting of waste.

50. Liquid wastes that could damage the environment should never be disposed of or allowed to directly drain into a watercourse or groundwater formation.

51. The prospector should make an effort to locate the wells site in a previously disturbed area (e.g. abandoned milpa) or natural clearing.

52. The prospector should use existing roads and avoid impacts to primary forest where there is an option of routing road within secondary forest.

53. Topsoil should be stored and replaced upon site abandonment to facilitate re-vegetation of the cleared area.

54. All exposed slopes should be covered and re-vegetated as a priority with indigenous species. This would occur only if natural colonization does not occur quickly enough to prevent erosion.

55. Well sites should be prepared with proper drainage which can also have the dual role of capturing contaminants.

56. All fuel and chemical storage areas should be sealed and bunded to contain any spillages and facilitate clean-up.

57. An optimum store of essential equipment for oil spill clean-up should be maintained on-site within a dedicated container.

58. Use biodiversity offset methods to compensate for forest loss due to road construction, field camps, well site and other facilities.

**Waste Disposal**

59. Where water based muds are employed in exploration the use of additives containing heavy metal is not acceptable. The use of oil based mud should not be allowed.

60. Mud containment structures (mud pit) should be built above ground and be constructed with sufficient capacity to contain all waste mud and cuttings plus contingency for rain water.

61. The mud pit should be surrounded by a raised bund which prevents ingress of run-off water from the well site and adjacent areas.
Abandonment

62. Wells that are not to be used in the future should be properly plugged and abandoned to positively isolate subsurface zones and protect useable surface waters.

63. The well head, casing and concrete cellars should be cut to a depth sufficient to ensure no impairment of surface use. Any holes should be filled and the surface contoured to fit surrounding terrain.

64. If temporary access roads have been built within the PA these should be dug up and access blocked, any bridges removed and the road harrowed and re-vegetated to restrict access.

PRODUCTION

65. Roads should be planned to minimize road mileage as long as this does not negatively impact PAs.

66. Pipelines extending to the new fields should run parallel to existing roads (preferably underground) to the extent possible. This will also simplify access for inspection and repairs.

67. Visual impacts to landscape features are an important consideration in protected areas and their buffer zones. Visual impact of permanent facilities should be considered in design so that impacts on the existing landscape are minimized. In particular the following should be taken into account:

- The design should take advantage of the existing topography and vegetation. To the extent possible facilities and storage tanks should have low profiles. Colours of facilities should blend in with the local environment to the extent feasible.
- Establish all facilities in locations that avoid critical terrestrial and aquatic habitat and plan construction activities to avoid sensitive times of the year;
- Use hand cutting where possible, avoiding the use of heavy equipment such as bulldozers, especially on steep slopes, wetlands and ecologically sensitive areas;
- Minimize the width of a pipeline ROW or access road during construction and operations as far as possible;
- Clean-up and fully reinstate the pipeline right-of-way and temporary sites such as workforce accommodation camps, storage yards, access roads, helipads and construction workshops, to the pre-existing topography and drainage contours;
- Reinstate off-site aggregate extraction facilities including borrow pits and quarries (opened specifically for construction or extensively used for construction);
- Implement repair and maintenance programs for reinstated sites;
- Install temporary and permanent erosion and sediment control measures, slope stabilization measures, and subsidence control and minimization measures at all facilities, as necessary;
- Regularly maintain vegetation growth along access roads and at permanent above ground facilities, and avoid introduction of invasive plant species.
- In controlling vegetation use biological and mechanical control measures and avoid the use of chemical herbicides as much as possible.

68. The possibility of using directional drilling techniques should be explored wherever practicable in order to cluster multiple wells on one site and minimize the number of well sites that have to be cleared.

69. Avoid construction of facilities in a floodplain, whenever practical, and within a distance of 100 m of the normal high-water mark of a water body or a water well used for drinking or domestic purposes;

70. Consider the use of existing utility and transport corridors for access roads and pipeline to the extent possible;

71. Consider the routing of access roads to avoid induced impacts such as increased access for poaching into PAs;

72. In protected areas, install wildlife escape ramps from open trenches (typically every 1km where wildlife is present);

73. Consider use of animal crossing structures such as bridges, culverts, and over crossings, along pipeline and access road rights-of-way;

74. Bury pipelines along the entire length to a minimum of 1 m to the top-of-pipe, wherever this is possible;

75. To the extent possible use horizontal directional drilling under rivers and creeks for the conveyance of the pipeline;

76. Pipelines should not impede the flow of surface water nor impede the free movement of wildlife. The preference is for pipelines to be buried and where not feasible elevated above ground.

77. Use bulk chemical storage tanks in one location to reduce number of sites for chemical storage.

78. Completion and well work-over fluids can typically include weighed brines, acids, methanol and glycols, and other chemical systems. These fluids are used to clean the wellbore and stimulate the flow of hydrocarbons, or simply used to maintain downhole pressure. Once used these fluids may contain contaminants including solid material, oil,
and chemical additives. Feasible disposal options may include one, or a combination of, the following:

- Injection to a dedicated disposal well, where available.
- Inclusion as part of the produced waste water stream for treatment and disposal.
- Spent acids should be neutralized before treatment and disposal.

79. Well maintenance activities (acidizing, fracturing, solvent stimulation, etc.) should collect spent treatment fluids in steel tanks and not open pits.

80. These fluids should either be injected into non-potable water zones below deep casings or be reclaimed, chemically neutralized and combined with produced fluids and treated to an acceptable level.

81. Produced water should be reinjected into either the producing formation or another non-potable water formation which is unsuitable for human use.

82. For onshore disposal, the permissible concentration limits are given below:

**Suggested Onshore Discharge Standards**

<table>
<thead>
<tr>
<th>Number</th>
<th>Parameter</th>
<th>On-shore discharge standards (Not to exceed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pH</td>
<td>5.5 - 9.0</td>
</tr>
<tr>
<td>2</td>
<td>Temperature</td>
<td>40°C</td>
</tr>
<tr>
<td>3</td>
<td>Suspended solids</td>
<td>100 mg/l</td>
</tr>
<tr>
<td>4</td>
<td>Zinc</td>
<td>2 mg/l</td>
</tr>
<tr>
<td>5</td>
<td>BOD at 27°C for 3 days</td>
<td>30 mg/l</td>
</tr>
<tr>
<td>6</td>
<td>COD</td>
<td>100 mg/l</td>
</tr>
<tr>
<td>7</td>
<td>Chlorides</td>
<td>600 mg/l</td>
</tr>
<tr>
<td>8</td>
<td>Sulphates</td>
<td>1000 mg/l</td>
</tr>
<tr>
<td>9</td>
<td>Total Dissolved Solids</td>
<td>2100 mg/l</td>
</tr>
<tr>
<td>10</td>
<td>% Sodium</td>
<td>60 mg/l</td>
</tr>
<tr>
<td>11</td>
<td>Oil &amp; grease</td>
<td>10 mg/l</td>
</tr>
<tr>
<td>12</td>
<td>Phenolics</td>
<td>1.2 mg/l</td>
</tr>
<tr>
<td>13</td>
<td>Cyanides</td>
<td>0.2 mg/l</td>
</tr>
<tr>
<td>14</td>
<td>Fluorides</td>
<td>1.5 mg/l</td>
</tr>
<tr>
<td>15</td>
<td>Sulphides</td>
<td>2.0 mg/l</td>
</tr>
<tr>
<td>16</td>
<td>Chromium (hexavalent)</td>
<td>0.1 mg/l</td>
</tr>
<tr>
<td>17</td>
<td>Chromium (Total)</td>
<td>1.0 mg/l</td>
</tr>
<tr>
<td>18</td>
<td>Copper</td>
<td>0.2 mg/l</td>
</tr>
<tr>
<td>19</td>
<td>Lead</td>
<td>0.1 mg/l</td>
</tr>
<tr>
<td>20</td>
<td>Mercury</td>
<td>0.01 mg/l</td>
</tr>
<tr>
<td>21</td>
<td>Nickel</td>
<td>3.0 mg/l</td>
</tr>
</tbody>
</table>
83. Full treatment septic systems to process all sewage should be installed for all construction, drilling and production facilities, and camps.

84. Flaring of gasses is an important environmental issue since it has serious environmental and health concerns. The practice of venting or flaring associated gas to the atmosphere should be discouraged since it wastes a valuable resource and is a contributor to greenhouse gas (GHG) emissions. However, this should be balanced against the fact that flaring or venting is an important safety measures to ensure gas and other hydrocarbons are safely disposed in the event of an emergency, power or equipment failure, or other plant upset condition.

85. Oil Companies should adopt measures consistent with the Global Gas Flaring and Venting Reduction Voluntary Standard (World Bank Group’s Global Gas Flaring Reduction Public-Private Partnership) when considering flaring and venting options for onshore activities.

86. Flaring of gas should be kept to a minimum. Where the volume of gas produced is far more than field operational requirements, an assessment of possible markets for the gas should be made or use the gas for on-site energy needs. If a market is not available, gas reinjection should be considered as an alternative to flaring.

87. In cases where flaring is the only viable option, measures to minimize flare volumes should be evaluated and flaring should be considered as an interim solution, with the preferred goal being the elimination of continuous production associated gas flaring.

The following pollution prevention and control measures should be considered for gas flaring:

- Use efficient flare tips, and optimize the size and number of burning nozzles.
- Maximize flare combustion efficiency by controlling and optimizing flare fuel/air stream flow rates.
- Locate flare at a safe distance from local communities and the workforce including workforce accommodation units.
- Implement burner maintenance and replacement programs to ensure continuous maximum flare efficiency.

**Spill contingency plan**

88. All petroleum development projects should require a spill contingency/response plan; however the plan should be especially robust in the context of PAs and their buffer zones. The prevention and control of oil spills is the most important environmental consideration for oil exploration and production in PAs and their buffer zone.

A proper oil spill response plan should clearly identify the actions necessary in the event of an oil spill, the equipment needed, the communications network, and the individual
responsibilities of key emergency response personnel, together with the reporting procedure to the authorities.

89. The operator must demonstrate the capability to implement the plan. The Spill Response Plan should address potential oil, chemical, and fuel spills from facilities, transport vehicles, loading and unloading operations, and pipeline ruptures. Where the facilities are located within PAs or pass through PAs the plan should include at a minimum:

- A description of the operations, site conditions, logistic support and oil properties;
- Identification of persons responsible for managing spill response efforts, including their authority, roles and contact details;
- Documentation of cooperative measures with government/private agencies as appropriate;
- Spill risk assessment, defining expected frequency and size of spills from different potential release sources;
- Oil spill trajectory in potentially affected surface water bodies, with oil fate and environmental impact prediction for a number of credible most-probable spill simulations (including a worst case scenario, such as blowout from an oil well);
- Clear demarcation of spill severity, according to the size of the spill using a clearly defined Tier I, Tier II and Tier III approach;
- Strategies and equipment for managing a Tier I and II spill at a minimum.

Arrangements and procedures to mobilize external resources for responding to larger spills and strategies for deployment

- Full list, description, location, and use of on-site and off-site response equipment and the response time estimates for deploying equipment;
- Sensitivity mapping of the environment at risk. Information should include: soil types; groundwater and surface water resources; sensitive ecological and protected areas; residential, industrial, recreational, cultural, and landscape features of significance; seasonal aspects for relevant features, and oil spill response types to be deployed;
- Identification of response priorities, with input from potentially affected or concerned parties;
- Clean up strategies and handling instructions for recovered oil, chemicals, fuels or other recovered contaminated materials, including their transportation, temporary storage, and treatment / disposal;

90. During the development of the plan vulnerable and sensitive areas should be determined for identification and protection should a spill occur.
91. The plan should address the disposal of contaminated waste generated by a spill, and the transportation and housing of extra labour for clean-up work.

92. Additional spill prevention and control measures specific to onshore oil and gas facilities include:

- The operator should conduct a spill risk assessment for the facilities and design, drilling, process, and utility systems to reduce the risk of major uncontained spills;
- Ensure adequate corrosion allowance for the lifetime of the facilities or installation of corrosion control and prevention systems in all pipelines, process equipment, and tanks;
- Install secondary containment around vessels and tanks to contain accidental releases;
- Install shutdown valves to allow early shutdown or isolation in the event of a spill;
- Develop an emergency shutdown system for significant spill scenarios so that the facility may be rapidly brought into a safe condition;
- Install leak detection systems on pipelines using best available technology;
- Develop corrosion maintenance and monitoring programs to ensure the integrity of all field equipment and in particular pipelines;
- Ensure adequate personnel training in oil spill prevention, containment, and response;
- Ensure spill response and containment equipment is ready for deployment and available for a response.

**Abandonment**

93. All cement, steel or wood installations not being left for others (e.g. use of the PA management) should be removed.

94. All oil and otherwise contaminated soil must be removed.

95. Wells should be plugged and abandoned in accordance with appropriate industry standards.

96. Roads and well or facility sites designated to be abandoned will have all paving and man-made structures removed to a sufficient depth below ground level to allow re-vegetation.

97. The surface will be contoured for drainage and control of erosion and the soil prepared for planting. Indigenous plant species should be planted in an array compatible with surrounding rainforest habitat.
5.8 Assessment and Example Terms of References

Companies investing within the six sectors in protected areas and their buffer zones have generated mixed responses to their investments. Some sectors like energy, mining, and petroleum have generated intense opposition. Protected areas managers and the various stakeholders who support the integrity of PAs are understandably concerned about potential impacts from these projects.

Part of the reason for the opposition, is that PA managers do not believe the investors have properly accounted for the impacts they may create. The investors on the other hand point out that their Environmental Statement is based on the scoping and Terms of Reference (ToR) approved by the DoE.

In an effort to address some of these concerns, this study has produced example terms of references for most of the sectors that typically do EIAs for investments within PAs and their buffer region. The ToRs are not prescriptive, since every project is different and require separate objective assessment; however they can serve as a useful guide to the DoE and the environmental stakeholder community about issues that should be addressed in a good quality EIA. The example ToRs are produced in Appendix 3 of this report.

5.9 Tools to Compensate for Biodiversity Impacts

Investments within Belizean protected areas will almost always result in developmental impacts which must then be balanced off against the need for national development and the more pressing need to generate revenues for PAs. Where impacts are unavoidable, the conscientious developer will want to reduce his footprint and to implement progressive measures to alleviate or cancel out net biodiversity impacts across the wider ecosystem.

In all cases, the initiatives below will require government support through the necessary enabling legislations and policies. The most promising options in the context of Belizean PAs are the following:

1 Biodiversity Offsets

This is a new and innovative tool being applied in developmental projects where the project proponents wish to compensate for his impacts through conscientious action within a defined area. Biodiversity offsets is defined as “Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented”.

Biodiversity offsets are commonly applied to compensate for any damage to biodiversity resulting from infrastructure developments and help to ensure that no net impact on biodiversity occurs within a defined area. Offsets are best developed within tightly
regulated legal frameworks that require impact assessments to be carried out prior to developments so that offsets can be planned appropriately. Such impact assessments would have identified the baseline prior to development, however where offsets cannot be implemented effectively, the presumption is that the project would be revaluated and may not be allowed to proceed where critical ecosystems are under threat.

Biodiversity offsets should produce quantifiable conservation outcomes along a hierarchy of available options. Its main purpose is to demonstrate a balance between a project’s impacts on biodiversity and the benefits achieved through the offset. This involves measuring both the losses to biodiversity caused by the project and the conservation gains achieved by the offset.

The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people’s use and cultural values associated with biodiversity.”

The main limitations/drawbacks of biodiversity offsets are:

- Political, environmental and social concerns,
- Difficulty in defining biodiversity metrics or currencies,
- Lack of fungibility of biodiversity,
- Maintenance of access to natural resource rights,
- Offset failure.

Although there is no single best way to design and implement biodiversity offset projects, an eight (8) step framework has been developed for a typical prospective offset design process that can help developers satisfy the Principles (see Table 5.8 below).

Table 5.8: Typical offset design process.

| Step 1: Review the development project’s scope and activities | • Understand the purpose and scope of the development project and the main activities likely to take place in the different stages of its life cycle.  
• Identify key decision ‘windows’ and suitable ‘entry points’ for integration of biodiversity offsets with project planning. |
| --- | --- |
| Step 2: Review legal framework and / or policy context for a biodiversity offset | • Clarify any legal requirement to undertake an offset and understand the policy context within which a biodiversity offset would be designed and implemented.  
• Explore government and lending institutions’ policies, as well as internal company policies, so the offset can be designed to meet these. |
| Step 3: Initiate stakeholder participation process | • Identify stakeholders at an early stage and establish a process for their effective involvement in the biodiversity offset design and implementation. |

Determining development impacts and biodiversity offset needs and opportunities

| Step 4: Determine the need for a biodiversity offset based on | • Identify biodiversity components in the area that will be affected by the development project. |
residual adverse effects by the development

- Determine the potential significance of impacts on biodiversity and design steps to limit impacts (use mitigation hierarchy: avoid, minimise, if relevant rehabilitate).
- Determine residual impacts that need to be offset.

Step 5: Quantify residual losses in biodiversity

- Decide on methods for calculating biodiversity losses and gains to show that ‘no net loss’ will be achieved through the biodiversity offset.
- Calculate the residual biodiversity losses.

Step 6: Assess the biodiversity gains that could be achieved at potential offset locations

- Identify a range of potential biodiversity offset locations and activities.
- Compare likely biodiversity gains and select preferred locations and activities for more detailed offset planning.

Designing the biodiversity offset: gains and select offset options (location and activities)

Step 7: Finalise offset design: calculate biodiversity gains and make final selection of suitable offset locations and activities.

- Quantify biodiversity gains using the same metrics used to calculate the losses.
- Finalise the selection of the offset location(s) and activities that are planned to result in no net loss of biodiversity, and to ensure adequate compensation to affected communities.

Step 8: Record the offset design and enter implementation process

- Record a description of the offset activities and location(s), including the final biodiversity ‘loss / gain’ account.
- Prepare a biodiversity offset management plan to guide implementation and demonstrate how no net loss of biodiversity will be achieved, how stakeholders will be satisfied and how the offset will contribute to any national requirements and policies.

Biodiversity offsets can be used to compensate for environmental impacts that may arise from investments in the six (6) sectors, although it may be more easily (and justifiably) applied to some projects than to others. At the moment, the system is not being officially used in Belize although past projects have incorporated many of its principles e.g. sustainable forestry projects harvesting mahogany which are required to replant a certain number of trees for each tree cut. At least one oil company currently prospecting for oil intend to use biodiversity offsetting to compensate for trees cleared for the road and drill pad (Nextera, 2012).

Biodiversity offsets will be especially applicable to investments in the mining, petroleum, and energy sectors, where unavoidable impacts at one location can be compensated through appropriate investment at another location. In many cases the investment will take place in the form of agro-forestry projects or the planting of multipurpose trees; however any good biodiversity offset project should adhere to the following principles.

- Compensation of environmental impacts is carried out in the same ecosystem type service category and, whenever possible, in the same location.
- When not possible, compensation is carried out in another ecosystem service category.
Figure 5.3: Schematic illustration of principle underlying biodiversity offsets.

- The compensation initiative should cover most of the impacts on ecosystem services.
- The remaining negative impacts not covered by the biodiversity offset measures can be compensated through the CO₂ markets or via Conservation Banking (see below).

Biodiversity offset projects should be subjected to verification from an independent body which should be tasked with analyzing the methods used and report accurately on the results.

2. Conservation Banking

Conservation banking is now emerging as a way for developers, both public and private, to take care of their environmental impact obligations whether legal or implied. It is a process by which biodiversity loss can be reduced by creating a framework which allows biodiversity to be reliably measured, and market based solutions applied. The framework requires
developers to source biodiversity credits through a market mechanism to offset biodiversity loss. In this way it provides a means to place a monetary value on ecosystem services.

Conservation banking entails protecting specific types of habitat and ‘selling’ that protected biodiversity to developers seeking to offset the impact of their developments elsewhere. The basic assumption as always is that the developer would have taken all appropriate steps to avoid harm in the first instance and that the scheme should only be applied where impacts are considered practically unavoidable.

In the United States, the scheme has been applied mostly to wetlands where unavoidable development impacts to one area of wetland must be compensated by protecting, enhancing or restoring an area of wetlands of similar functions and values in compensation for those that were damaged.

A conservation bank is similar to a bank account, but instead of money, the "account" holds habitat that is worth credits. Landowners sell these credits to a conservation banking firm, which in turn sells them to developers that need to compensate for the conversion of habitat to buildings roads, etc. Every habitat bank is covered by a conservation easement that ensures it will be protected forever and has an endowment that generates funds to manage the land in perpetuity.

Valuation of the credits will depend on the scarcity and the proximity of the ecosystem type to the one that is being impacted.

The success of conservation banking depends on the following:

- The ability to maintain viable habitat that protect the species the land was intended to protect,
- The conservation banking firm does not sell more credits than it has approval for from the regulating agency,
- There is built in provision for monitoring and management over the long term.

Conservation banking has been criticized for encouraging development by providing an easy and convenient way out for developers, however in a world where developmental pressures are high and the onward march of development appears unstoppable it is a convenient and effective means to control valuable and endangered habitats. On the landowner side, conservation banking provides an incentive to be a good steward of the land and make protection of endangered species a financial incentive for the landowner instead of a liability.

There is considerable latitude in Belize to introduce Conservation Banking to offset developmental impacts on threatened species and ecosystems. Perhaps the most pressing and attractive area to apply this approach is in the tourism sector where rampant degradation and removal of the endangered littoral forest is taking place. Conservation
banking would allow land owners in this zone to receive payments from tourism developers to protect their land falling within this zone and its associated habitats and species for a fee into perpetuity. The principles could also be applied advantageously in the mining and energy sectors.
6 Standardized Guidelines to Determine the Significance of Impacts

It is important that all consultants engaged in the preparation of Environmental Statements follow a set of standardized guidelines for evaluating, describing and quantifying the types of impact anticipated during the execution and operation of projects likely to impact on PAs and their buffer zones.

In Belize there are no standardize guidelines resulting in evaluation of impact significance that differ widely and are of limited use when determining impacts from one area to another. The absence of standardize guidelines make EIAs of little value and dubious worth in assessing the true magnitude of impacts from project activities. Standardization of impacts values and ratings is a critical part of producing any guidelines for EIAs addressing impacts to PAs and buffer zone since the mitigation measures propose should be proportional to the impact.

Standardization of impact significance will allow for easier cross referencing through the use of common terms and gives reviewers of the ES a more objective platform from which to evaluate the significant impacts. This should not compromise on the need for objectivity and subjectivity in the professional judgment of the individual EIA practitioner.

In the narrative below, a generalized description is given for the main impact terms to be used in the impact tables, followed by a more topical guideline for the significance criteria to be used in the individual impact studies.

1. Characterization of Impact Terms

   a) Description of the Potential Impact – This should be an objective statement describing the changes both adverse and beneficial that are likely to be brought about by the proposed project. All predictions given should include the reasonable worst case for any sensitive receptor liable to be affected.

   b) Assessment of the potential impact – The EIA practitioner should be given sufficient latitude within his/her professional capacity to make his own value judgment as to the significance of impacts bearing in mind that such opinions will be open to later review by planning authorities, peers and the national stakeholder community. In exercising his/her judgment the practitioner should justify the position taken by giving quantitative evidence and temporal changes with the mitigation measures taken into account. In cases where the mitigation measure is only given as a recommendation, the impact prediction does not need to take the mitigation into account.
In the past, consultants retained for impact studies have used varying descriptive categories and terms to describe the significance of the anticipated impacts. This has created confusion and a lack of symmetry in the interpretation of the impact significance. For the purpose of this study, the following auditable statements of significant impacts should be used by all consultants to the exclusion of all others except where a strong and justifiable case can be made for an exception.

- Major adverse impact
- Moderate adverse impact
- Minor adverse impact
- No perceived or indeterminate impact
- Minor beneficial impact
- Major beneficial impacts,

c) **Duration of impact** – This is the time scale over which an impact is likely to take place bearing in mind that it may take many years for some projects to mature and the impacts to become manifested. There may also be temporal changes in the significance of the impact within discrete time cycles.

d) **Comments** – This is where the EIA Practitioner should justify his value judgment on the significant of impacts and expand on his/her understanding of the issue by giving probabilities for impact occurring, chances for reversibility, frequency of occurrence etc.
2. Impact Prediction Table Format

The impact prediction table for the individual topics covered should be constructed using the following format. Consultants should include these within each chapter within the ‘Potential Impacts’ section.

<table>
<thead>
<tr>
<th>Description of Potential Impact</th>
<th>Assessment of Potential Impact</th>
<th>Duration of Impact</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Terms of Significance</td>
<td>Time Scale/frequency</td>
<td>Statements of Justification</td>
</tr>
<tr>
<td>- Impact Description #1</td>
<td>Describe as either</td>
<td>Describe as either</td>
<td>These should be short factual statements to justify and support opinions given under Assessment of Potential impacts and Duration of Impacts.</td>
</tr>
<tr>
<td></td>
<td>▪ Major adverse impact,</td>
<td>▪ Permanent,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Moderate adverse impact,</td>
<td>▪ Long Term,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Minor adverse impact,</td>
<td>▪ Medium Term,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ No perceived or indeterminate impact</td>
<td>▪ Short Term</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Minor beneficial impact,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Major beneficial impacts,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Impact Description #2</td>
<td>Describe as either</td>
<td>Describe as either</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Major adverse impact,</td>
<td>▪ Permanent,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Moderate adverse impact,</td>
<td>▪ Long Term,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Minor adverse impact,</td>
<td>▪ Medium Term,</td>
<td></td>
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<tr>
<td></td>
<td>▪ No perceived or indeterminate impact</td>
<td>▪ Short Term</td>
<td></td>
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<tr>
<td></td>
<td>▪ Minor beneficial impact,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Major beneficial impacts,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Impact Prediction # 3 etc.</td>
<td>Describe as either</td>
<td>Describe as either</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Major adverse impact,</td>
<td>▪ Permanent,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Moderate adverse impact,</td>
<td>▪ Long Term,</td>
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<td></td>
<td>▪ Minor adverse impact,</td>
<td>▪ Medium Term,</td>
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<tr>
<td></td>
<td>▪ No perceived or indeterminate impact</td>
<td>▪ Short Term</td>
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<tr>
<td></td>
<td>▪ Minor beneficial impact,</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>▪ Major beneficial impacts,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Significance Criteria for Selected Study Topics

A. Archaeology

Significance Criteria
Some of the criteria used for the scheduling of monuments can also be used to assess the importance and cultural heritage value of an archaeological site. These include criteria covering period, rarity, documentation, group value, survival/condition, fragility/vulnerability, diversity and potential. When combined with professional judgement, these criteria can be used to assess the value of archaeological sites and monuments, historic buildings and landmarks such as battlefields.

The magnitude of the potential impact should be assessed for each site or feature independently of its archaeological or historical value. The significance of the impact can then be determined by combining the value of the cultural heritage resource with the predicted magnitude of impact. The impact significance should be considered before and after mitigation measures have been taken into account in the period covering the construction and operational phases.

Table of Significance Criteria for Archaeological Assessments

<table>
<thead>
<tr>
<th>Impact Type and Magnitude</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• The complete destruction of an element of the built heritage or historic landscape.</td>
</tr>
<tr>
<td></td>
<td>• High visual intrusion that would seriously damage the setting of the heritage resource, such that their integrity is compromised and appreciation and understanding of them diminished.</td>
</tr>
<tr>
<td></td>
<td>• Disturbance to more than 75% of the area of known or estimated buried archaeological features.</td>
</tr>
<tr>
<td>Moderate Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Severe damage to, or loss of, regionally important cultural heritage resources.</td>
</tr>
<tr>
<td></td>
<td>• Damage to nationally important cultural heritage resources without adequate recording.</td>
</tr>
<tr>
<td></td>
<td>• Severe compromise or degradation of the setting or context of regionally important cultural heritage resources.</td>
</tr>
</tbody>
</table>
| Minor Adverse Impact | This significance rating applies if the proposed project results in:
| | • The compromise or degradation of the setting or context of nationally significant cultural heritage resources.
| | • Disturbance to between 25 - 75% of the area of known or estimated buried archaeological features.
| **Minor Impact** | This significance rating applies if the proposed project results in:
| | • Damage to, or loss of, locally important cultural heritage resources.
| | • Minor damage to regionally important cultural heritage resources.
| | • Compromise or degrade the setting or context of locally or regionally important cultural heritage resources.
| | • Disturbance to less than 25% of the area of known or estimated buried archaeological features.
| **No Perceived or Indeterminate Impact at this Stage** | This significance rating applies if the proposed project results in:
| | • No appreciable impacts, either positive or negative, on any known or potential cultural heritage assets.
| | • An inadequate information baseline or if data lack subjectivity
| **Minor Beneficial Impact** | This significance rating applies if the proposed project results in:
| | • Enhanced existing historic landscape/townscape character through beneficial landscaping and/or good design.
| | • Restoration or enhancement to the form, scale, pattern or sense of place of the cultural heritage resource through good design.
| | • Removal or reduction of existing impacts affecting nationally important cultural heritage resources or their setting/context.
| | • Removal or reduction of existing impacts (direct and indirect) affecting locally or regionally important cultural heritage resources or their setting/context.
| **Major Beneficial Impact** | This significance rating applies if the proposed project results in:
| | • Potential improvement through removal of damaging or discordant existing impacts (direct or indirect) on regionally or nationally important heritage resources, for significant or extensive restoration or enhancement of characteristic features or their setting.
| | • Removal of existing visual intrusion, such that the integrity, understanding and sense of place of a highly valued area, a group of sites or features of national or regional importance is re-established.
| | • An improvement to both the on-site and the off-site soil and/or water quality
### Table Summarising Cultural Heritage Value

<table>
<thead>
<tr>
<th>Value</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>World Heritage Sites.</td>
</tr>
<tr>
<td>High</td>
<td>Ancient Monuments, Historic Buildings and sites of national importance which have not been scheduled.</td>
</tr>
<tr>
<td>Medium</td>
<td>Conservation Areas, site and building types which are rare in the region or their setting, Large-scale but undesigned sites e.g. Cultural complexes, earthworks etc.</td>
</tr>
<tr>
<td>Low</td>
<td>Other archaeological remains such as isolated earthwork fragments or vestigial crop-marks, historic buildings which are damaged or fragmentary.</td>
</tr>
<tr>
<td>Negligible</td>
<td>Stray finds, or sites which are badly damaged and with few remains.</td>
</tr>
</tbody>
</table>

### B. Ecology

#### Significance Criteria

The following criteria have been developed to determine the level of impact significance and to provide a transparent and auditable decision-making process to the reader. It is important to note that the significance criteria are not designed for use as a prescriptive tool and should be used for guidance purposes only.

#### Table of Significance for Ecological Assessments

<table>
<thead>
<tr>
<th>Impact Type and Magnitude</th>
<th>Receptor Category</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>Designated sites</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Permanent effects on a statutory designated site of nature conservation importance that impacts on the integrity of the site and / or the reason for which the site was originally designated.</td>
</tr>
<tr>
<td></td>
<td>Rare, endangered and protected species</td>
<td>• A permanent and widespread effect on a population of rare, endangered or protected plant or animal species or a substantial effect on their environment at one or more locations within the study area.</td>
</tr>
<tr>
<td>Non-protected habitats and species</td>
<td>Moderate Adverse Impact</td>
<td>Designated sites</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Rare, endangered and protected species</td>
<td>Moderate Adverse Impact</td>
<td>Designated sites</td>
</tr>
<tr>
<td>Non-protected habitats and species</td>
<td>Minor Adverse Impact</td>
<td>Designated sites</td>
</tr>
<tr>
<td>Non-protected habitats and species</td>
<td>No Perceived or Indeterminate Impact at this Stage</td>
<td>Designated sites</td>
</tr>
<tr>
<td>Rare, endangered and protected species</td>
<td>Minor Beneficial Impact</td>
<td>Designated sites</td>
</tr>
</tbody>
</table>

- **Non-protected habitats and species**
  - A permanent and widespread effect on a population of plant or animal species or a substantial effect on their environment at one or more locations within the study area.

- **Moderate Adverse Impact**
  - Designated sites
  - This significance rating applies if the proposed project results in:
    - Permanent effects on a non-statutory designated site of nature conservation value that impact on the integrity of the site and / or the reason for which the site was originally designated.
  - Rare, endangered and protected species
  - A permanent but limited effect on a population of protected or regionally notable plant or animal species or their habitat within the study area.
  - Non-protected habitats and species
  - A permanent but limited effect on a population of plant or animal species or their habitat within the study area.

- **Minor Adverse Impact**
  - Designated sites
  - This significance rating applies if the proposed project results in:
    - Temporary (< 1 year) and limited effects on a non-statutory designated site of nature conservation value that does not impact on the integrity of the site and / or the reason for which the site was originally designated.
  - Rare, endangered and protected species
  - Temporary disturbance (< 1 year) to a population of protected or regionally notable plant or animal species or their habitat within the study area.
  - Non-protected habitats and species
  - Temporary disturbance (< 1 year) to a population of plant or animal species or their habitat within the study area.

- **No Perceived or Indeterminate Impact at this Stage**
  - Designated sites
  - This significance rating applies if the proposed project results in:
    - The level of exposure is considered to be less than the tolerance of the receptor, therefore an impact is unlikely.
    - An inadequate information baseline information or data lacking subjectivity
  - Rare, endangered and protected species
  - Non-protected habitats and species

- **Minor Beneficial Impact**
  - Designated sites
  - This significance rating applies if the proposed project results in:
    - Temporary (< 1 year) and limited beneficial effects on a
<table>
<thead>
<tr>
<th>Major Beneficial Impact</th>
<th>Designated sites</th>
<th>Non-statutory designated site of nature conservation value that improves the integrity of the site and / or the reason for which the site was originally designated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare, endangered and protected species</td>
<td>Temporary benefits (&lt; 1 year) to a population of protected or regionally notable plants or animal species or their habitat within the study area.</td>
<td></td>
</tr>
<tr>
<td>Non-protected habitats and species</td>
<td>Temporary benefits (&lt; 1 year) to a population of plant or animal species or their habitat within the study area.</td>
<td></td>
</tr>
</tbody>
</table>

### Trees and Forest

**Significance Criteria**

The following series of criteria on significance of impacts applies to trees and forest and is included here as a separate component within the ecology portion of the assessment. It will provide a transparent and auditable platform in the reader’s decision making process, however they are not designed to be used as a prescriptive tool and should be used for guidance purposes only.
### Table of Significance Criteria for Trees and Forest

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>This significance rating applies if the proposed project:</td>
</tr>
<tr>
<td></td>
<td>• Affects the whole site or adversely impact on &gt;20% of the A Category trees/woodland.</td>
</tr>
<tr>
<td>Moderate Adverse Impact</td>
<td>This significance rating applies if the proposed project:</td>
</tr>
<tr>
<td></td>
<td>• Affects a significant proportion of the site or adversely impacting on &gt;10% of the A Category trees/woodland or &gt;20% B Category trees/woodland.</td>
</tr>
<tr>
<td></td>
<td>• Adversely impact &gt;20% of B Category trees/woodland.</td>
</tr>
<tr>
<td>Minor Adverse Impact</td>
<td>This significance rating applies if the proposed project:</td>
</tr>
<tr>
<td></td>
<td>• Affect a localised area on site or adversely impact on &gt;2% of the A Category trees/woodland or &gt;10% B Category trees/woodland.</td>
</tr>
<tr>
<td></td>
<td>• Adversely impact on &gt;10% B Category trees/woodland.</td>
</tr>
<tr>
<td>No perceived or indeterminate impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td>at this Stage</td>
<td>• No observable impact or an impact solely affecting R Category trees/woodland.</td>
</tr>
<tr>
<td></td>
<td>• Impact that is not possible to either fully identify or evaluate based on available information.</td>
</tr>
<tr>
<td>Minor Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• A localised gain in the number/extent of trees or woodland through management or new planting.</td>
</tr>
<tr>
<td>Major Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• A whole site gain in the number/extent of trees or woodland through management or new planting.</td>
</tr>
</tbody>
</table>
C. Air Quality

Significance Criteria

Significance was assessed by reference to guidance as detailed in the policy context.

Table of Significance - Air Quality

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A considerable impact (by extent, duration or magnitude) of more than local significance or in breach of standards.</td>
</tr>
<tr>
<td>Moderate Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Limited impact (by extent, duration or magnitude) which may nonetheless be considered significant.</td>
</tr>
<tr>
<td>Minor Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Slight, very short term or highly localised impact of no significant consequence.</td>
</tr>
<tr>
<td>No Perceived or indeterminate Impact at this Stage</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A neutral impact or no significant impact.</td>
</tr>
<tr>
<td></td>
<td>- An inadequate information baseline or data lacking subjectivity.</td>
</tr>
<tr>
<td>Minor Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Slight, very short term or highly localised impact of no significant consequence, an advantageous or positive impact.</td>
</tr>
<tr>
<td>Major Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A considerable impact (by extent, duration or magnitude) or more than local significance or in breach of standards, an advantageous or positive impact.</td>
</tr>
</tbody>
</table>

D. Noise

Significance Criteria

The following series of ‘significance criteria’ have been developed to help ascertain the level of impact significance (i.e. major, moderate, minor, no perceived impact) and to provide a transparent and auditable decision-making process to the reader. It is important to note that
the significance criteria have not been designed to be used as a prescriptive tool and have been used primarily for guidance purposes only.

**Table of Significance - Noise**

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Increase in noise levels &gt; 10dB(A)</td>
</tr>
<tr>
<td>Moderate Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Increase in noise levels of between 5 – 10 dB(A)</td>
</tr>
<tr>
<td>Minor Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Increase in noise levels of between 1 – 5 dB(A)</td>
</tr>
<tr>
<td>No Perceived or indeterminate Impact at this Stage</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- The level of exposure is considered to be less than the tolerance of the receptor, therefore an impact is unlikely.</td>
</tr>
<tr>
<td></td>
<td>- &lt;1 dB(A)</td>
</tr>
<tr>
<td>Minor Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Reduction in noise levels between 1 – 10 dB(A)</td>
</tr>
<tr>
<td>Major Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Reduction in noise levels &gt; 10dB(A)</td>
</tr>
</tbody>
</table>

**E. Surface Water Quality**

**Significance Criteria**

The table below presents a series of ‘significance criteria’ developed to help ascertain the level of impact significance for surface water quality assessments. It should provide a transparent and auditable decision-making process to the reader; however it should not be used for guidance purposes only and not as a prescriptive tool.

**Table of Significance - Water Quality**

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
</table>

F. Landscape and Visual

Significance Criteria

The following table of ‘significance criteria’ for landscape and visuals will help to provide a transparent and auditable decision making process to the environmental statement reviewer. It is important to note that the significance criteria have not been designed as a prescriptive tool and should be used for guidance purposes only.

Table of Significance - Landscape and Visual

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Considerable deterioration in the existing view or landscape character.</td>
</tr>
<tr>
<td>Moderate Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Limited detrimental impact (by extent, duration, or magnitude) which may nonetheless be considered significant.</td>
</tr>
<tr>
<td>Minor Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Slight, very short term or highly localised detrimental impact of no significant consequence.</td>
</tr>
<tr>
<td>No Perceived or indeterminate Impact at this Stage</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• No significant impact to water</td>
</tr>
<tr>
<td></td>
<td>• An inadequate information baseline information or data lacking subjectivity.</td>
</tr>
<tr>
<td>Minor Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Slight, very short term or highly localised beneficial impact of no significant consequence.</td>
</tr>
<tr>
<td>Major Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Considerable positive impact (by extent, duration, or magnitude) of more than local significance.</td>
</tr>
</tbody>
</table>
This may also refer to the loss of a large number of individual features or considerable damage to a landscape feature or area of high value.

**Moderate Adverse Impact**
This significance rating applies if the proposed project results in:
- A noticeable deterioration in the existing view or landscape character. This may also refer to loss of some individual landscape features or noticeable damage to a landscape feature or area of moderate value.

**Minor Adverse Impact**
This significance rating applies if the proposed project results in:
- A perceptible deterioration in the existing view or landscape character. This may also refer to loss of only minimal landscape features or negligible damage to a landscape feature or area of moderate value.

**No Perceived Impact at this Stage**
This significance rating applies if the proposed project results in:
- No discernible deterioration or improvement in the view or landscape character.

**Minor Beneficial Impact**
This significance rating applies if the proposed project results in:
- A perceptible improvement in the existing view or landscape character. This may also be concerned with the addition of a few landscape features or improvement of a minimal area of landscape value.

**Major Beneficial Impact**
This significance rating applies if the proposed project results in:
- Considerable improvement in the existing view or landscape character. This may also be concerned with the addition of a considerable number of landscape features or improvement of a large area of landscape value.

---

**Landscape Assessment Definitions:**

The significance of a landscape impact is determined by the combination of magnitude of the impact and the landscape’s sensitivity.

The sensitivity of change can be classified as follows:

- **High:** A landscape of particularly distinctive character, susceptible to relatively small changes;
- **Medium:** A landscape of moderately valued characteristics reasonably tolerant to change;
- **Low:** A relatively unimportant landscape, the nature of which is potentially tolerant to substantial change.
The magnitude of change can be classified as follows:

- **High**: Notable change in landscape characteristics over an extensive area;
- **Medium**: Moderate changes in a localised area;
- **Low**: Virtually imperceptible change in any components; and
- **Very low**: Virtually imperceptible change of a temporary nature.

### Visual Assessment Definitions

The significance of a visual impact is determined by the combination of magnitude of the impact and the sensitivity of the receptor. Assessment on property is generally carried out on the basis of predicted effects on ground level views (including ground floor and garden views). However, a general assessment of views from upper stories will be given where appropriate. It should be noted that the assessment of views from properties is based on a best assumption from publicly accessible locations close to properties. Where it has not been possible to assess the effects on properties from public viewpoints or where confidence in predictions is low, this should be stated in the text.

The sensitivity of receptors can be classified according to receptor type, as shown in the table below viz:

### Table of Visual Impacts Significance

<table>
<thead>
<tr>
<th>Sensitivity of receptors</th>
<th>Magnitude of change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td>Open view of site; panoramic view of most of site; occupying most of the view resulting in significant change in the existing view, and/or proximity to the site;</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Partial view of site; a clear view of part of the site; partial view of most of it, or a distant view in which the site forms a proportion of the wider view resulting in noticeable change in existing view, and/or proximity to site;</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>Poor view, or view difficult to perceive resulting in barely perceptible change in existing views, and/or proximity to site; and</td>
</tr>
</tbody>
</table>
1000m from the site, and rail traffic.

G. Ground Conditions

Significance Criteria

The following ‘significance criteria’ for ground conditions are given to help you ascertain the level of impact significance. They should be used for guidance purposes only.

Table of Significance - Ground Conditions

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Impact</td>
<td>Adverse</td>
</tr>
<tr>
<td></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Chronic damage to human health and/or pollution of sensitive water resource</td>
</tr>
<tr>
<td>Moderate Impact</td>
<td>Adverse</td>
</tr>
<tr>
<td></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Slope instability/ subsidence causing major structural damage to existing properties</td>
</tr>
<tr>
<td></td>
<td>• Pollution of non-sensitive water resource</td>
</tr>
<tr>
<td></td>
<td>• Significant harm caused to designated sites</td>
</tr>
<tr>
<td>Minor Impact</td>
<td>Adverse</td>
</tr>
<tr>
<td></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Slope instability/ subsidence causing minor damage to existing properties</td>
</tr>
<tr>
<td></td>
<td>• Harm, although not necessarily significant, which may result in financial loss or expenditure to resolve. Non-permanent effects on human health.</td>
</tr>
<tr>
<td></td>
<td>• Minor harm caused to designated sites</td>
</tr>
<tr>
<td>Indeterminate or no Perceived Impact at this Stage</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• No change to soil or water quality, or harm caused to any identified receptors</td>
</tr>
<tr>
<td>Minor Impact</td>
<td>Beneficial</td>
</tr>
<tr>
<td></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• An improvement in the slope stability/ loose soil conditions beneath the site</td>
</tr>
<tr>
<td></td>
<td>• An improvement to the on-site soil and/or water quality</td>
</tr>
<tr>
<td>Major Impact</td>
<td>Beneficial</td>
</tr>
<tr>
<td></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• An improvement to both the on-site and the off-site soil and/or water quality</td>
</tr>
</tbody>
</table>
### H. Agriculture

#### Significance Criteria

The following ‘significance criteria’ are given to help you ascertain the level of impact significance from agricultural changes. They should be used for guidance purposes only.

#### Table of Significance - Agriculture

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Adverse Impact</strong></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A high magnitude change can be defined as a large scale impact which is generally permanent and the key</td>
</tr>
<tr>
<td></td>
<td>elements and characteristics of the existing agricultural environment are completely lost.</td>
</tr>
<tr>
<td><strong>Moderate Adverse Impact</strong></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A medium magnitude change can be defined as a moderate scale impact which can be either permanent or</td>
</tr>
<tr>
<td></td>
<td>temporary and where the key elements and characteristics of the existing agricultural environment are</td>
</tr>
<tr>
<td></td>
<td>partially lost.</td>
</tr>
<tr>
<td><strong>Minor Adverse Impact</strong></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A low magnitude change can be defined as a small scale impact, either permanent or temporary and where</td>
</tr>
<tr>
<td></td>
<td>there is only a minor loss or alteration of the key elements and characteristics of the existing</td>
</tr>
<tr>
<td></td>
<td>agricultural environment.</td>
</tr>
<tr>
<td><strong>Indeterminate or no Perceived Impact</strong></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- An insignificant magnitude of change is where no impacts upon key elements or characteristics of the</td>
</tr>
<tr>
<td></td>
<td>baseline landscape are considered likely.</td>
</tr>
<tr>
<td><strong>Minor Beneficial Impact</strong></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A low magnitude change can be defined as a small scale impact, either permanent or temporary and where</td>
</tr>
<tr>
<td></td>
<td>there is only a minor gain or positive alteration of the key elements and characteristics of the</td>
</tr>
<tr>
<td></td>
<td>existing agricultural environment.</td>
</tr>
<tr>
<td><strong>Major Beneficial Impact</strong></td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- A high magnitude beneficial change can be defined as a large scale impact which is generally permanent</td>
</tr>
<tr>
<td></td>
<td>and the key elements and characteristics of the existing agricultural environment are greatly improved.</td>
</tr>
</tbody>
</table>
I. Traffic and Transport

Significance Criteria

The following are important ‘significance criteria’ for the determination of impact significance within the traffic and transportation section of the environmental statement. It should provide an open and auditable decision making tool for the user, however the user is reminded that these are guidance notes only and are not meant to be prescriptive or to override professional judgement.

Table of Traffic and Transport Criteria

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Large scale impacts.</td>
</tr>
<tr>
<td></td>
<td>- Impacts that is generally permanent.</td>
</tr>
<tr>
<td></td>
<td>- Severance of major transport routes.</td>
</tr>
<tr>
<td></td>
<td>- High level of disruption to normal operation of public transport.</td>
</tr>
<tr>
<td>Moderate Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Moderate scale of impact(s).</td>
</tr>
<tr>
<td></td>
<td>- Permanent or temporary impact(s).</td>
</tr>
<tr>
<td></td>
<td>- Increase in construction traffic on minor roads.</td>
</tr>
<tr>
<td></td>
<td>- Moderate level of disruption to normal operation of public transport.</td>
</tr>
<tr>
<td>Minor Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Low scale impacts.</td>
</tr>
<tr>
<td></td>
<td>- Permanent or temporary impacts.</td>
</tr>
<tr>
<td></td>
<td>- Increase construction traffic on major public roads or trunk roads.</td>
</tr>
<tr>
<td></td>
<td>- Temporary severance of minor transport routes.</td>
</tr>
<tr>
<td></td>
<td>- Increase in light road vehicles.</td>
</tr>
<tr>
<td>No Perceived or indeterminate Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td>at this Stage</td>
<td>- No likely impact(s) upon key elements or characteristics of existing traffic and transport.</td>
</tr>
<tr>
<td></td>
<td>- Insufficient baseline data or subjective data</td>
</tr>
<tr>
<td>Minor Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>- Decrease construction traffic on major public roads or trunk roads.</td>
</tr>
<tr>
<td></td>
<td>- Temporary severance of minor transport routes,</td>
</tr>
<tr>
<td></td>
<td>- Decrease in light road vehicles.</td>
</tr>
</tbody>
</table>
J. Socio-economic

Significance Criteria

The following socio-economic ‘significance criteria’ will help to determine the level of impact significance. It should provide an open and assessable decision making tool for the reader. Users however, should note that these significance criteria are for guidance purposes only.

Table of Socio-Economic Significance Criteria

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Rationale for Assessment of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• A considerable impact (by extent, duration or magnitude) or more than local significance or in breach of standards, a detrimental or negative impact.</td>
</tr>
<tr>
<td>Moderate Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Limited impact (by extent, duration or magnitude) which may nonetheless be considered significant, a detrimental or negative impact.</td>
</tr>
<tr>
<td>Minor Adverse Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Slight, very short term or highly localised impact of no significant consequence, a detrimental or negative impact.</td>
</tr>
<tr>
<td>No Perceived or indeterminate Impact at this Stage</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• A neutral impact of no significance</td>
</tr>
<tr>
<td></td>
<td>• Insufficient baseline information or subjectivity</td>
</tr>
<tr>
<td>Minor Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td></td>
<td>• Slight, very short term or highly localised impact of no significant consequence, an advantageous or positive impact.</td>
</tr>
<tr>
<td>Major Beneficial Impact</td>
<td>This significance rating applies if the proposed project results in:</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• A considerable impact (by extent, duration or magnitude) of more than local significance resulting in an advantageous or positive impact.</td>
</tr>
</tbody>
</table>
7 Conclusions and Recommendations

7.1 Reflections on the Strategies and Guidelines

The focus of this study is to promote and encourage investments in PAs and their buffer areas to generate badly needed revenues for PAs. The purpose of the guidelines is to make projects within protected areas and buffer areas more responsible and responsive to the need of protecting the environment and conserving biodiversity while not discouraging legitimate investors. The guidelines require that developers give careful thought to the potential impacts of their project with a view of minimizing these to the extent possible and to include key players such as PA managers and buffer communities during the process.

Although increasing the emphasis on proper vetting of projects will ultimately benefit the environment, it will place an additional time constraint and expense on the investor. It will also place an additional burden on public sector agencies which are currently under resourced to carry out their duties.

It is quite possible that some investors may be put off by the additional measures and requirements. In particular much of the focus is on encouraging buffer communities and small to medium size enterprises to invest. There is a question as to whether ramping up the requirements for environmental vetting will pose a deterrence to these groups by setting the bar for participation too high, however that is not the intent.

The PA management community believes that the NPAS has a lot to offer genuine investors. The value lies in the careful stewardship of resources and investments that has taken place within PA system over a long period of time.

Well planned and executed projects that respect the environment are a major plus for any company’s corporate image while sustainable management of resources will ensure the investors long term productivity and profits. In addition, carelessly executed projects leaves investors to criminal liability which is not the outcome we are trying to achieve.

It is quite likely that some sectors such as tourism which depend on environmental integrity may buy into more stringent guidelines as long as they are applied evenly across the stakeholder and investor communities. On the other hand they may discourage investors in other sectors who may see the guidelines as excessive and punitive.
This suggests that the implementation of additional environmental requirements and more rigorous vetting for investors will have to be introduced in tandem with a raft of incentive measures and inducements which will help to convince investors that the measures will best serve their long term interest and secure their investments.

In addition to this, there is a need to clarify the terms and conditions for investments within PAs and their buffer areas. This suggests the introduction of policies and regulations, including amendments to some of the existing legal instruments. It is hoped that the recommendations listed below will be a precursor to this and will serve as a useful starting point and a living document to further work in this area.

7.2 Recommendations

On the basis of the outcome of this study the following recommendations are tabled for the consideration of the NPAS and the national environmental stakeholder community:

1. Plan, coordinate and conduct TEV study of all Belizean PAs as a matter of priority.
2. Standardize management plans across the entire PA system.
3. Promote preparation/updating of management plans to reflect increased emphasis on financial sustainability, revenue generation and investor engagement strategies.
4. Promote the use of dynamic modelling technology to determine changes under different use scenarios within the PAs (especially in areas considered sensitive sites) consistent with developmental goals and socioeconomic resources needs.
5. Ensure acceptance and adherence of PA managers across the PA landscape to NPASP principles and goals.
6. Further integrate PAs into national development Plans and Strategies.
7. The relevant agencies should develop a comprehensive national policy on investments within PAs to complement the creation of mechanisms to promote private sector investments within PA.
8. Clarify projects to be allowed within PAs under the various designations and the terms and conditions to be attached.
9. Appoint a technical working group of national and international experts to chart the way forward and advise the GoB on how best to prepare the country and achieve effective participation in REDD+ and the CDM.
10. Lobby for creation of policies and passage of legislation to empower adoption of PES in Belize.

11. Require that all developmental projects (Schedule I and II) falling within Belizean PAs obtain environmental clearance in the form of a Limited Level Environmental Study or a full EIA.

12. Require that developmental projects falling within the buffer zones of PAs should be subjected to adequate environmental controls.

13. Promote broad spatial and regional development planning in addition to the practice of EIA. This can take the form of Local Development Strategies and Regional Development Plans.

14. Lobby the government to place new restrictions on land use within the buffer region of PAs that are more compatible with corridor linkages, and biodiversity protection.

15. Introduce the practice of Strategic Environmental Assessment as a useful tool to inform early decision making on potentially contentious projects.

16. Require EIA assessments in PAs and buffer zones to map the distribution and intensity of future threats and forecast trends using predictive modeling, risk assessments, scenario development and vulnerability analyses.

17. Strive for increase financial self-sustainability of the PA system while continuing to lobby the political directorate for financial, policy and regulatory support.

18. Use the principle of equity to allocate the cost and distribute the benefits of PA revenue generation activities.

19. Enforce the land use policy both in the coastal zone region and in the buffer zone of terrestrial PAs as a matter of priority.

20. Zonation schemes should be drawn up for each PA and should clearly show areas open for investments, infrastructural development and trading.

21. Adopt a policy of permitting up to 10% of a protected area be managed for activities that support and are compatible with the primary objective of the protected area in line with the IUCN recommendation.

22. Increase the requirements for environmental oversight for projects falling within buffer zone areas of PAs.

23. Require PA managers to provide potential investors with all relevant information on the PAs so that a proper assessment of environmental impacts can be carried out.
24. Encourage PA managers to become engaged in the EIA process for investments within PAs and their buffer zone but especially during the screening and scoping stage.

25. Create zonation schemes around PAs commensurate with the designation of the site and declare these areas as sensitive sites and area of influence for PAs. For the various sites the radius should be:
   
   a. International sites – 10kms
   b. IUCN Category 1 to IV sites (and national equivalents) - 5kms
   c. IUCN Category V and IV sites – 3kms
   d. Local sites – 1km

26. Vigorously promote the principle of biodiversity offset and conservation banking as viable tools to compensate for unavoidable environmental impacts arising from investments within PAs. This may necessitate the passing of enabling legislation and regulations.

27. Lobby strongly for screening decisions on developmental projects be made public and published. This is especially relevant for projects falling within PAs and their buffer zones.

28. Display the ToR for developmental projects requiring EIA and LLES on the DoE website.

29. Require that the DoE produce full scoping reports for projects in addition to the ToR.

30. Ensure that all relevant stakeholders for PAs are allowed to contribute to the scoping report for project affecting PAs and buffer communities.

31. Take steps to ensure that the DoE adopt a more robust approach to public consultations especially for developments targeted at PAs or their buffer zones.

32. Promote investments within PAs and their buffer zones which demonstrate capacity for value added and the creation of jobs.

33. Use fiscal policies and market mechanisms as incentives to encourage investments in PAs.

34. Identify and target markets nationally and internationally for certified Belizean green products.

35. Mobilize technical assistance and support for training of PA managers within each of the identified investment sectors.

36. Increase the capacity of the Lead Agencies to promote and manage private sector investments through training, recruitment and capacity building.
37. Develop institutional capacity in the lead agencies for national participation in REDD+, CDM and PES.

38. Appoint a technical committee of eminent Belizean and international PA specialist, PA managers, legal, social and financial experts to advise and support the NPAS in institutionalizing and operationalizing the strategies and guidelines promulgated in this report.

39. Create dialogue between the Technical Committee and the investor community through regular meetings, workshops and training and coordinate through the agency of Beltraide and the Belize Chamber of Commerce.

40. Support community and small scale investments in PAs from small and medium size enterprises (SMEs).

41. There is a pressing need for good quality monitoring in PAs where investors have been given the green light.

42. Monitoring of investments/concessions within PAs should be paid for by the developer and ideally carried out by the PA, the DoE or other competent Government Agency.

43. PAs should establish a set of conditions or values reflecting environmental, physical and social aspects of the site.

44. Establish standards and the standardization of indicators for protected areas across their various management categories and zones.

45. Instead of creating and invoking rules, PA managers should work to get investor buy in to strong management practices. This will prevent environmental deterioration while allowing revenue generation.

46. Investigate potential for congruence and collaboration with other ongoing initiative which focus on community development and natural resource management in rural areas.

47. Consideration and evaluation of the recommendations within this report with a view of incorporating elements into the revision of PA legislation which is ongoing and congruent to this study.
7.3 The Way Forward

The implementation of the strategies and guidelines will require concerted action on the part of all national stakeholders. The most immediate task is for the main actors (e.g. the lead government agencies, conservation NGOs and CBOs, international partners etc.) to come together and agree a plan of action to implement the strategies and guidelines.

The next step would be to engage with the private sector to inform and apprise them of the strategies and guidelines (some of this was done during the consultancy; however this engagement needs to be sustained). The engagement with the private sector should offer opportunities for frank discussion and constructive dialogue and discussion on the important issues of interest to both sides. The current Business Tasters now being run by the Belize Chamber of Commerce and Industry (BCCI) is one such venue, however many other opportunities exist or can be created. Fruitful discussions have already been held with the BCCI in this regard. The following summarizes actions that will need to be taken at the administrative/management level.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Government (lead agencies) initiates comprehensive implementation planning process</td>
</tr>
<tr>
<td>2</td>
<td>Mobilize PA management community (form committees if appropriate)</td>
</tr>
<tr>
<td>3</td>
<td>Develop a work plan and an action plan</td>
</tr>
<tr>
<td>4</td>
<td>Agree on a budget and funding needs to effect implementation of strategy and guidelines</td>
</tr>
<tr>
<td>5</td>
<td>Engage the productive sectors</td>
</tr>
<tr>
<td>6</td>
<td>Based on the outcome of the engagements lobby for the passage of necessary legislations, regulations and policies including for PES</td>
</tr>
<tr>
<td>7</td>
<td>Push for standardization of monitoring protocols</td>
</tr>
<tr>
<td>8</td>
<td>Implement strategies and guidelines in all new investment projects impacting PAs and buffer zone areas</td>
</tr>
</tbody>
</table>
The PAs are faced by many pressing problems and it is inevitable that some issues will need to be prioritized over others e.g. mining in protected areas while others will need to be addressed over different time frames. **Table 7.1** gives an indication of actions that will need to be taken by the NPAS to prepare and safeguard the system for increased investments.

**Table 7.1**: Implementation schedule for key actions arising from the strategy and guidelines.

<table>
<thead>
<tr>
<th>Action</th>
<th>Implementation Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a participatory planning process, involving all major stakeholders including indigenous and local communities as well as other stakeholders.</td>
<td>✓</td>
</tr>
<tr>
<td>Identify major threats to selected conservation targets, and develop threat abatement strategies that will need to be addressed when considering investments (e.g., habitat loss, illegal logging etc.).</td>
<td>✓</td>
</tr>
<tr>
<td>Review national and legislative policy frameworks in regards to investments in PAs. Identify legislative and institutional gaps and barriers in regards to private investments.</td>
<td>✓</td>
</tr>
<tr>
<td>Revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for PES and other investments.</td>
<td>✓</td>
</tr>
<tr>
<td>Integrate protected areas needs into national development strategies and programs.</td>
<td>✓</td>
</tr>
<tr>
<td>Develop or update management plans to create enabling environment for sector investments.</td>
<td>✓</td>
</tr>
<tr>
<td>Undertake valuation study of all protected areas within the NPAS. Conduct national assessments of economic and cultural values of protected areas, and include economic valuation and natural resource accounting in planning.</td>
<td>✓</td>
</tr>
<tr>
<td>Identify and foster economic opportunities and markets for goods and services (including ecosystem services) produced by protected areas.</td>
<td>✓</td>
</tr>
<tr>
<td>Include climate change adaptation measures in plans and management objectives including those covering investments.</td>
<td>✓</td>
</tr>
<tr>
<td>Identify and remove or mitigate perverse incentives. Wherever feasible, redirect these to positive</td>
<td>✓</td>
</tr>
<tr>
<td>Incentives for conservation.</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Identify financial needs and gaps. Implement production of business plans for PAs.</td>
<td>✓</td>
</tr>
<tr>
<td>Enforce urgent measures to halt illegal exploitation of resources from protected areas. Strengthen national laws on this issue.</td>
<td>✓</td>
</tr>
<tr>
<td>Undertake environmental impact assessments (EIAs) of any plan or project potentially affecting protected areas and include strong biodiversity protection measures in EIA legislation and/or processes.</td>
<td>✓</td>
</tr>
<tr>
<td>Develop national approaches to liability and redress measures in relation to damage to protected areas including biodiversity offset and conservation banking.</td>
<td></td>
</tr>
<tr>
<td>Develop national approaches to rehabilitation and restoration of protected areas due to damage from investments.</td>
<td></td>
</tr>
<tr>
<td>Develop institutional capacity within lead agencies and PA administration to manage investments and provide oversight.</td>
<td>✓</td>
</tr>
<tr>
<td>Develop and adopt appropriate long-term monitoring and assessment systems for evaluating the effectiveness of mitigation measures used by investors to reduce development impacts.</td>
<td>✓</td>
</tr>
</tbody>
</table>


Bibliography


Haas, G., R. Aukerman, 2011. *Increasing the Efficiency in the Collection, Administration and Investment of Protected Areas Fees in Belize.*


ITTO, 2005. Revised ITTO criteria and indicators for the sustainable management of tropical forests including reporting format.


http://www.world-tourism.org /frameset/frame_sustainable.html
Appendix 1 - IUCN Categories for PAs

**Category I**
*Ia:* An area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species available primarily for research and/or environmental monitoring.
*Ib:* A wilderness area is a large area of unmodified or slightly modified land and/or sea retaining its natural character and influence without permanent or significant habitation which is protected and managed so as to preserve its natural condition.
(Strict Nature Reserve/Wilderness Area)

**Category II**
A natural area of land and/or sea designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations; (b) exclude exploitation or occupation inimical to the purposes of the area; and (c) provide foundation for spiritual, scientific, educational, recreational, and visitor opportunities all of which must be environmentally and culturally compatible. (National Park)

**Category III**
An area containing one or more specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.
(Natural Monument)

**Category IV**
An area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species. (Habitat/Species Management Area)

**Category V**
An area with coast and sea, as appropriate, where the interaction of people and nature over time has produced an area with significant aesthetic, ecological and/or cultural value and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area. (Protected Landscape/Seascape)

**Category VI**
An area containing predominantly unmodified natural systems managed to ensure long term protection and maintenance of biological diversity while providing at the same time a sustainable flow of natural products and services to meet community needs. (Managed Resource Protected Area)

*Source:* IUCN
Appendix 2 – Example Terms of Reference for Select Sectors

A. Tourism Sector

1. Acronyms and Abbreviations

All acronyms and abbreviations used in the EIA must be clearly and succinctly defined and described in this section. This will relieve the reader of the need to search for the first occurrence of a word and the citing of the acronym or abbreviation in the text.

2. Executive Summary

A general summary of the EIA shall be provided in this section. The summary shall be written using a vocabulary that can be easily understood by the public. It shall include at least the following information about the project from the EIA:

- Objectives and Justification
- Location
- Project Proponents
- Project Description
- Other Project Alternatives
- Environmental Setting
- Evaluation of Impacts
- Mitigation and Monitoring Measures
- Environmental Management Plan
- Issues raised by stakeholders and any outstanding issues

3. General Information

3.1 Objectives of and Justification for the Proposed Project

3.1.1 Objectives: A statement of the general and specific objectives (purpose) of the proposed project, including whether it is a new project, an expansion of an existing project (e.g., increase in land area or increase in visitor capacity) or modernization of an existing operation.

3.1.2 Justification for the Project: Provide a justification for the proposed project (need) highlighting the benefits to surrounding communities and economic development of the region and country.

3.2 Project Proponents

- Names, addresses, telephone numbers, and applicable legal documentation of proponents (including developers, major equipment suppliers if part of project team, shareholders and providers of financing, and representatives).
• Names and contact information for responsible parties within the organization.
• Financial viability of the company (including a certified banking statement indicating that the company is financially stable and reputable).
• Bonding requirements and proof of ability to meet bonding requirements sufficient to cover the anticipated costs of environmental management during all phases, as well as the costs, by a third party, of decommissioning and long-term post-closure liabilities associated with the project.

3.3 Project Team

This section shall provide information on the multidisciplinary team that prepares the EIA. The types of professionals included in the team shall be appropriate to the type of project and the type of environment in which the project is located and may include (but not be limited to) engineers, architects, biologists, geologists, hydrologists, air quality experts, archeologists, anthropologists, sociologists and economists. The information provided for each member of the EIA project team includes the following:

• Names, addresses and registry numbers of contractors.
• Names, contact information, qualifications and registry numbers of key personnel involved in the study; as well as an affidavit indicating their area of participation.
• List of professionals/experts participating in the EIA, their areas of expertise, degrees, experience, professional registrations and stamps, seals and signatures.

3.4 Legal and Regulatory Framework

This section of the EIA shall define the legal framework under which the EIA is being completed listing and summarizing requirements or alternatives used as benchmarks, and evidence of non-applicability or compliance including:

• Ownership with written authorization
• Period of lease/permit/concession agreement
• Maps showing the lease/permit/concession area
• Applicable environmental standards, norms and requirements set forth at the international, national, regional and/or local levels
• Required regulatory approvals and/or permits for all stages and their status
• Applicable tourism strategies and plans – national, regional, and local
• Applicable natural resource management or protected area management plans and responsible agency(ies) (demonstrate conformity and compliance with all applicable plans)

4 Project and Alternatives Description

The project proponent shall submit a full description and location of the proposed project and reasonable alternatives including ancillary facilities and operations such as the camp/housing for construction and operation phases, borrow and disposal areas, sanitary services, waste disposal and transportation infrastructure, etc. as addressed through 4.1 to 4.3 below. It shall include at a minimum:

4.1 Location
The general location of the project and associated activities in terms of:

- Political-administrative location (region, district, town or other relevant political administrative units) with accompanying location map
- Means of site access – i.e., by air, river, road, train or vehicle
- Maps of project area at a scale of no less than 1:50,000 or as required by the regulatory agency
- Project plan and location on a fold-out A3 (11” X 17”) page.
- Indicate the project area and the direct and indirect areas of influence for the physical, biological and social-economic-cultural impacts

4.2 Summary of Proposed Project and Alternatives

All project alternatives that are reasonable and feasible and meet the purpose and need for the proposed project shall be identified, summarized in this section, and evaluated in the EIA as appropriate. In addition to the proposed project, such alternatives include alternative locations, alternative site configuration of elements of the project, alternative size, and alternative plans for construction, operation and decommissioning of the project including best practices that may avoid and/or reduce the adverse impacts to the physical, biological or social-economic-cultural environments.

If the project area or the buffer zone of the project area for an alternative is in an ecologically fragile area, the description of the alternative must include a clear justification for not opting for another site. Identify which alternatives will be carried through the analysis in the EIA and the basis for that decision.

4.3 Project and Alternatives Details

The EIA shall provide specific project details for the proposed project and each alternative. The level of detail presented shall be the same for the proposed project and each alternative evaluated. The following project details shall be provided:

- Type and nature of the project
- Type (resort, hotel, camping, day use)
- Overview of all proposed facilities and activities and their relationship
- A detailed drawing showing access points, layout of all project components including on-site roads, walkways and paths, existing structures, topography and natural features such as water bodies, wetlands and geologic structures
- A summary table showing the type, quantity and size of each component
- Anticipated use: maximum, minimum and average by month and season
- Principal project facilities
  - Location and design information – primary material of construction (wood, brick, stone, etc.), layout and dimensions. Design drawings should be provided for each facility, including: Plan (overhead view), Elevations (front view), Profiles (side view) and Sections.
  - Hotel (including cabins, cabanas and other overnight visitor quarters)
  - Restaurant(s) and bar(s)
  - Conference centre
  - Entertainment venue (indoor or outdoor)
- Shopping area (mall, arcade, craft market, etc.)
- Camping
- Swimming pool(s)
- Gym/Exercise room
- Athletic courts (tennis, basketball, raquet ball, etc.)
- Golf course (including vegetation management e.g. Irrigation (including grey water systems if applicable), Fertilization, Pest control
- Dock for visitor arrival or recreational activities
- Dredging (if applicable) including legal authorization for the dredging, dimensions of area to be dredged, map showing extent of dredging operations
- Plans for beach development
- Walking trails
- On-site walkways
- Staff housing
- Storage areas, warehouses and repair shops
- Fuel stations including, location, number, size and configuration of tanks (buried or above ground, leak protection, etc.)
- Electrical energy including demand and source of supply
- Water supply including demand source and treatment
- Waste handling and disposal
- Green spaces/landscaping

- Access and transportation
  - Roads including all new and existing roads to be used (including closed roads that will be reopened, if applicable) and roads to be constructed or upgraded
  - Other transport systems (if applicable)
- A GANTT or critical path management chart for the entire project, from
- Key areas (related to environmental sensitivity/importance) that will remain undisturbed during construction (waterways, wetlands, forested areas and other “green space,” etc.)
- Erosion control structures such as:
  - Equipment this should include equipment Roster, specifying type and quantity by size, weight, motor size, and fuel requirements for each piece of equipment or machinery used in each activity
- Labour during construction and operation
- Raw materials to be used for construction
- Construction camp (if applicable) showing layout, ancillary facilities and location and description of services
- Decommissioning of temporary structures including measures for returning the area to pre-construction features
- Closure and decommissioning plan
  - The project description shall include at least a general Restoration and Closure Plan, recognizing that terms of closure may be very different when this phase approaches
The description of restoration measures should include the size of the area to be restored as well as concurrent, temporary and final restoration measures to be used and their schedules. For each measure include:

5 Environmental Setting

Based on information available from the literature, government and special studies or other sources, the EIA shall provide information on environmental setting for the different types of physical, biological and social-economic-cultural environments for the current situation, important trends and predicted situation in the absence of the proposed project. All sources of data must be cited in the EIA when and where they are used. Indicate the direct and indirect and cumulative impact areas of influence for physical, biological, and social-economic-cultural impacts and basis for defining area. This section shall include at a minimum, the following information:

Physical Environment

5.1 Geologic Resources and Hazards
Cross sections of the geology including soil horizons
- Geologic characteristics at all project structure locations and in the area of influence.
- Geological map of the project area and area of influence at a scale of 1:10,000.

Topography and slope conditions and geomorphology
Seismicity and stability characteristics

5.2 Soil Resources
The EIA shall describe baseline soil resources, and make use of maps, tables and accompanying narrative text to describe the soils at the project site and along new or reconditioned access routes associated with the project and included in the EIA.
- Types, capacity and uses
- Fertility and potential uses of the land for agriculture
- Stability and permeability
- Erosion and sedimentation potential
- Quantity and quality available for re-vegetating and restoring the disturbed area at time of closure

5.3 Water Resources

Surface water
- Names and locations on maps of all permanent and intermittent streams, rivers, wetlands, lakes and reservoirs within the area of influence
- Seasonal fluctuations in area and volume of wetlands, lakes and reservoirs
- Delineation of watersheds and water drainage pattern in the area of influence using cadastral/aerial/remote sensing satellite imageries (map)
Groundwater
- Provide a map and identify and describe aquifers and underground waters adjacent to the project, indicating the depth of the water table along with trend data:
  - Location and characteristics of all existing springs and wells in the area of influence (on topographic map)
  - Groundwater recharge data
  - Water quality (only necessary if project will discharge wastewater, includes irrigation, or will use fertilizers and pesticides on landscaped areas)
    - Existing water quality data
    - Supplemental sampling and analysis (if existing data is not adequate to
    - Surface water and groundwater standards that apply to the project

5.4 Air and Climate
Baseline information for air resources shall be collected for at least one year or as required by the regulatory agency and shall include at a minimum the following:
Climate and meteorology
- Source of data (meteorological station(s) from which climatological data have been obtained)
- Temperature variations
- Rainfall (total precipitation, rainfall intensity, and duration by month)
- Wind Rose (Wind direction and speed, 24 hourly data)
- Risk of high impact storms, storm surges, hurricane levels, tropical storms frequency and seasonality

5.5 Noise and Vibration
Present a description of the noise and vibration levels for receptors near where noise generating activities of the project may occur. The EIA shall include:
- Location of monitoring stations
- Daytime and night time noise levels (measured in decibels) 5.5.3 Inventory of existing noise sources

5.6 Aesthetic and Visual Resources
- Photos presenting baseline panoramic views of the project site from potential viewpoints
- Viewsheds or other aesthetic or landscape resources
- Existing sources of light contamination

Biological Environment
The EIA shall provide detailed information on the location and condition of ecosystems in and around the project area in the form of narrative, maps and tables, including the following:

5.7 Vegetation/Flora
- Vegetative mapping of terrestrial and wetland habitats (aquatic and marine if appropriate) for project area and areas affected by the project (e.g., project site and areas around new roads)
- Species and structure (abundance, density, status, plant communities, presence of invasive species, etc.)
5.8 **Aquatic and Terrestrial Wildlife/Fauna**

- Fish and Aquatic Resources including Identification of fish, mussel, macroinvertebrate and other aquatic species
- Wildlife Resources
  - Species (including status, i.e., endemic, migratory, exotic, endangered, threatened, keystone, etc.), life history, and seasonal use
  - Breeding areas
  - Mating and brooding areas
  - Migratory corridors (if applicable)
  - Important wildlife use areas (roosts, clay licks, etc.)

5.9 **Ecosystems: Terrestrial, Wetlands, Aquatic, Marine**

*Much if not all that may be needed to address the environmental setting for terrestrial, wetlands, aquatic and/or marine ecosystems may have been covered in Sections 5.7 and 5.8. This section is not intended to duplicate that information; rather, it should integrate the information to ensure that the structure and function of each ecosystem is adequately presented.*

5.10 **Endangered or Threatened Species and Habitats**

*Identify all species in the project area. This section should highlight all endangered and threatened species and critical habitat that potentially occur in the vicinity of the project.*

5.11 **Protected Areas**

*Identify on maps the specific locations and boundaries of relevant national parks, sanctuaries, reserves, etc., as well as any areas proposed for protection. Provide a brief narrative description of each area.*

**Social-Economic-Cultural Environment**

5.12 **Socio-Economic Conditions**

*Identify nearby human settlements including the following information for each settlement:*

i. Population (size, gender and age distribution)
ii. Cultural characteristics (religion, ethnic composition, languages spoken, etc.)
iii. Economic activities (employers, employment and incomes)
iv. Literacy rates
v. Community organizations
vi. Skills, services and goods availability in the communities
vii. Public Health and Safety
   a. Diseases in the project area (including the sources of data and the methodology used to collect and analyze the data)
   b. Level of emergency services and access to clinics, doctors and hospitals
   c. Existing practice for assessment of occupational health

5.13 **Infrastructure**
For each human settlement identified in subsection 5.12, describe the infrastructure in or serving the settlement, including the following information:

Transportation infrastructure
i. Roads – Location and condition of all existing roads in the project area that may be used by the project or tourists coming to the project
   a. Surface materials
   b. Erosion and sediment control
   c. Traffic capacity, patterns and densities
   d. Safety levels and current circulation issues
ii. Airports and air strips – Locations, conditions, capacities, current uses and trends
iii. Other transportation infrastructure as applicable such as rail, bus, pipelines for fueling, harbors for cruise ships, and marinas for boats – Locations, conditions, capacities, current uses and trends

Public health infrastructure
i. Drinking water supplies and treatment,
ii. Wastewater treatment and management
iii. Solid and hazardous waste management and treatment

Communications infrastructure
i. Types of communications systems
ii. Types of transmission (wired or wireless)

Energy infrastructure
i. Types of energy
ii. Sources including location and description of generating facilities in the area of influence
iii. Transmission lines and/or pipelines
iv. Fuel storage facilities

5.14 Cultural, Archeological, Ceremonial and Historic and Resources

Identify all cultural, archaeological, ceremonial and historic resources within the area of influence, including the following information:

i. Data and maps relating to archaeological, cultural, ceremonial, and historic sites in the direct vicinity of the project
ii. Information on indigenous people or other traditional cultures, if any

5.15 Land Use

Describe actual and potential land use showing location, size and proximity within and surrounding the project area, including land use maps, and to extent possible, integrated into one map.

i. Population centers, including information and locations of
ii. Agricultural lands
iii. Forested lands
iv. Protected areas
v. Wetlands and mangroves
vi. Other environmentally sensitive areas
vi. Tourism and recreation areas  
viii. Culturally sensitive areas  
ix. Flood plains and water bodies  
x. Coastal zones  
xi. Other land uses as appropriate

6 Assessment of Impacts

The EIA shall provide information on potential impacts (direct, indirect and cumulative) and the magnitude and frequency of potential impacts on physical, biological, social-economic-cultural resources resulting from construction, operation and closure of the proposed project and alternatives.

The assessment shall use standardized predictive methods, such as models, to determine the specific range of impacts on environmental and socio-economic resources. The EIA shall identify which impacts are significant and the criteria used to make this judgment. Critical data input from project description and environmental setting analysis projecting the conditions in the environmental setting in the absence of the proposed project shall be used as the baseline upon which potential impacts are forecast. The EIA shall also identify sources of data used in the analysis and the uncertainties associated with the outputs of each method used.

For each assessment area information must be given on overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context.

Physical Impacts

6.1 Geologic Resources and Hazards

Potential impacts to geologic resources and potential effects on project structures shall be described including but not limited to geologic hazards, Changes in topography and drainage patterns.

6.2 Soil Resources

Potential impacts to soil resources shall be described. The analysis shall include, but not be limited to soil quality including contamination and impacts on use, erosion, slope alteration, vegetation removal and drainage patterns.

6.3 Water Resources

Potential impacts to surface water and groundwater shall be described. The analysis shall include but not be limited to the geomorphology, quantity of use, water quality especially from runoff, erosion and sedimentation from roads, disturbed areas and stream crossings, wastewater discharges, chemical contamination (herbicides fertilizers and pesticides), spills and accidents.

6.4 Air and Climate
Potential impacts to air resources shall be described including but not limited to impacts on ambient air quality, receptors (e.g., communities, schools, soils, water bodies, ecosystems), greenhouse gas generation

6.5 Noise and Vibration

Potential impacts from noise shall be described including but not limited to potential noise levels at different representative sites in the project area and in communities near the project area, potential vibration due to blasting and movement of heavy equipment, and related damage to materials and structures.

6.6 Aesthetic and Visual Resources

Potential impacts to Aesthetic Resources, including light pollution, shall be described including but not limited to Impacts on visual resources and landscapes and increases in light contamination

Biological Impacts

Potential impacts to biological resources shall be described and quantified including but not limited to the following:

6.7 Vegetation/Flora and Associated Ecosystems

Describe and quantify alterations in vegetative cover due to:
   i. Deforestation or wetlands destruction
   ii. Other vegetative type conversions
   iii. Direct vegetative removal
   iv. Increased road access in remote areas leading to destruction of existing vegetative cover (land use changes)
   v. Spread of noxious or invasive species

6.8 Aquatic and Terrestrial Wildlife/Fauna and Associated Ecosystems

Describe and quantify alterations in aquatic and terrestrial wildlife populations due to:

Fish and Aquatic Resources
   i. Loss in habitat from changes in water quality due to sedimentation and use of chemicals for vegetation maintenance
   ii. Disturbance of aquatic resources during construction, operations, or maintenance activities

Wildlife Resources
   i. Loss of habitat, migratory routes/corridors, and breeding areas due to changes in vegetative cover/wetlands loss
   ii. Disturbance of habitat, migratory routes/corridors and breeding areas due to project construction, operation, and maintenance, recreational use, and human settlement associated with the project (e.g., noise, vibration, illumination, vehicular movement)
   iii. Increased hunting

6.9 Endangered or Threatened Species or Habitats
Describe and quantify impacts to endangered or threatened species or habitats

i. Biodiversity
ii. Individual species (with special emphasis on endemic, rare, threatened and endangered species)

6.10 Protected Areas

Social-Economic-Cultural Impacts

The EIA shall assess potential positive and negative impacts to social-economic-cultural resources including but not limited to the following:

6.11 Socio-Economic Conditions

i. Increased individual incomes through employment and trade
ii. Employment opportunities for local residents
iii. Increased tax base
iv. Displacement and relocation of current settlements, residents or community resources
v. Displacement or disruption of people’s livelihoods (e.g., fishing, hunting, grazing, farming, forestry and tourism)
vi. Public finance requirements – will more infrastructure need to be built and maintained to meet the demands of increased population in the areas of public education and public service (water, sanitation, roads, emergency services, etc.)
vii. Change in population, religious, ethnic or cultural makeup of community
viii. Impacts on worker health and safety

6.12 Infrastructure

Transportation infrastructure
This section of the EIA addresses impacts of transportation and traffic patterns on existing roads. The impacts of new and existing roads on water quality, biological resources and land use should be addressed in those respective sections. The EIA shall assess potential impacts to transportation systems including but not limited to the following:

i. Potential changes to traffic patterns, densities, and traffic safety issues in area affected by project
ii. Potential impacts to previously inaccessible areas from improvement of roads

Public health infrastructure

i. Increased need for public health infrastructure
ii. Alterations to public health infrastructure

Communications infrastructure

i. Increased need for communications infrastructure
ii. Alterations to communications infrastructure

Energy infrastructure

i. Increased need for energy infrastructure
ii. Alterations to energy infrastructure
6.13 Cultural, Archeological, Ceremonial and Historic and Resources

i. Destruction, damage and alteration during construction
ii. Introduction of visual or audible elements that diminish integrity
iii. Loss of medicinal plants
iv. Loss of access to traditional use areas
v. Impacts to previously inaccessible resources from development/improvement of roads

6.14 Land Use

i. Temporary and permanent changes in land use by both area and location
   a. Increased need for additional infrastructure
   b. Increased need for tourism and recreation infrastructure
   c. Housing market (during construction and operation and after closure)
   d. Identification of any components of the proposed project that would fall within 25- or 100-year flood plains

7 Mitigation and Monitoring Measures

This section of the EIA must include measures designed to mitigate potential adverse impacts to physical, biological and social-economic-cultural resources from construction, operation and closure of the proposed project and alternatives. These shall include measures to avoid and prevent, and if needed, to reduce or minimize adverse impacts. The project proponent must include measures considered to be “best practices” in the design of all alternatives.

Here and/or in the Environmental Management Plan section, proposed mitigation shall be described in auditable terms and at a level of detail sufficient to demonstrate its effectiveness in addressing the concern or performance criterion, including its anticipated level of effectiveness and/or measurable performance, and design specifications.

The monitoring plan must include monitoring throughout the life of the project for each potential mitigation to confirm the effectiveness of the measure and support contingency plans to provide assurance that the project, at the site preparation, construction, operation, expansion, and closure stages will meet applicable environmental requirements/standards by law, and fall within the limits of impacts deemed acceptable upon approval of the EIA. Some important items to address in the mitigation plan and associated monitoring plans include, but are not limited to the following:

Physical Impacts

7.1 Geologic Resources and Hazards

i. Pre-excavation, onsite geological inspection and geotechnical study protocols to determine slope stability and landslide risks
ii. Slopes built and maintained to avoid landslides and favor revegetation and soils formation
iii. Slope stabilization by constructing retaining walls, using vegetation, geotextile membranes, or other mechanical methods

7.2 Soil Resources
i. Erosion and sedimentation control measures (temporary and permanent) including when each will be installed or implemented, how often it will be checked and the process for and timing of removal of temporary measures
ii. Spoil and disposal measures
iii. Best management practices to minimize soil disturbance
iv. Decommissioning/Rehabilitation Plan-if needed (summary of relevant measures with full document in Annex)
v. Restrictions on discharge of pollutants to soil

7.3 Water Resources

Water Quality
i. Water Quality Management Plan to include sewage and domestic wastewater, plus nonpoint sources – runoff, erosion and sediment control prevention measures (summary of relevant measures with full document in Annex)
ii. Spill Prevention and Containment Plan (summary of relevant measures with full document in Annex)
iii. Solid Waste Management Plan (summary of relevant measures with full document in Annex)
iv. Hazardous Waste Management Plan (summary of relevant measures with full document in Annex)
v. Transport system construction and maintenance to avoid erosion and sedimentation including:
vi. Waste minimization practices

Water Quantity
i. Water conservation practices
ii. Mitigation measures unique to specific alternatives

7.4 Air and Climate
i. Dust control measures
ii. Energy conservation measures
iii. Emissions control measures
   a. Emissions reduction equipment
iv. Maintenance and inspection of equipment and vehicles using combustion engines
v. Spill Prevention and Containment Plan (summary of relevant measures with full document in Annex)

7.5 Noise and Vibration
Noise control measures
i. Noise reduction technologies (suppression equipment, sound-absorbing structures, vibration dampening devices, berms, noise barriers, etc.)
ii. Rerouting of traffic and other infrastructure related activities to minimize impacts of noise and vibration
iii. Time of day limitations on movement of heavy equipment when in close proximity to houses

7.6 Aesthetic Resources
i. Redesign height and location of structures blocking view or producing light pollution

ii. Lighting minimization

iii. Visual/Landscape Management Plan (summary of relevant measures with full document in Annex)

**Biological Impacts**

**7.7 Vegetation/Flora and Associated Ecosystems**

i. Control of noxious and invasive weeds

ii. Measures to compensate for loss or damage of forests, wetlands or other critical ecosystems, including establishment of new protected areas

iii. Restoration/Rehabilitation Plan for disturbed areas (summary of relevant measures with full document in Annex)

**7.8 Aquatic and Terrestrial Wildlife/Fauna and Associated Ecosystems**

**Fish and Aquatic Resources**

i. Scheduling construction to avoid critical or important fish life history periods (e.g., spawning)

ii. Relocation of sensitive, threatened or endangered species

iii. Mitigation measures unique to specific alternatives

**Wildlife Resources**

i. Controls on hunting within the project area

ii. Modify locations of structures and locations and timing of activities to avoid critical ecosystems, migratory routes and breeding areas

iii. Scheduling construction to avoid critical or important wildlife history periods (e.g., breeding, nesting)

iv. Relocation of sensitive, threatened or endangered species

v. Mitigation measures unique to specific alternatives

**Social-Economic-Cultural Impacts**

**7.9 Socio-Economic Conditions**

i. Investigate option of selecting of an alternate site for the project,

ii. Training local residents for employment in the project

iii. Development of a “Code of Conduct” (with associated training program) for workers to show respect to the local populations and their culture and social rules

iv. Development of an Occupational Health, Industrial Safety and Accidents Prevention Program with appropriate accident prevention program, reporting and periodic review (summary of relevant measures with full document in Annex)

v. Spill Prevention and Containment Plan (summary of relevant measures with full document in Annex)


vii. Mitigation measures unique to specific alternatives

**7.10 Infrastructure**

Transportation infrastructure
This section of the EIA addresses mitigation measures for transportation and traffic patterns on existing infrastructure (roads, airports, air strips, harbors, etc.). Mitigation of impacts of new and existing transportation infrastructure on water quality and biological resources and land use should be addressed in those respective sections.

i. Transportation Plan (summary of relevant measures with full document in Annex)
   a. Placement of traffic signals
   b. Establishing, posting and enforcing speed limits for the vehicles that transport material
   c. Training employees, contractors and subcontractors on measures to reduce or avoid potential accidents

Public health infrastructure

Communications infrastructure

Energy Infrastructure

7.11 Cultural, Archeological, Ceremonial and Historic and Resources

i. Indicate how structure and activity locations could be modified to avoid significant archaeological, cultural, ceremonial and historic sites
ii. If avoidance is not possible, how will developer conduct appropriate resource recovery operations before disturbing the sites
iii. How will the project delineate boundaries and post signs identifying existing archaeological, cultural and historic sites on roadsides and within the project area boundaries so that they are easily recognized by machinery operators, workers and tourists
iv. Development of a code of conduct for activities in indigenous and local communities with the consent of and in collaboration with the community
v. Development protocols for use during construction and operation stages for identifying and responding to archeological, cultural, ceremonial and historic sites not identified during the preliminary surveys

7.12 Land Use

i. Criteria and method for calculating compensation for loss of land and crops
ii. Method for compensation to farmers and ranchers for crop or forage losses and restore lost agricultural lands at the end of the project.
iii. Method of compensation to property owners for relocation of their homes in the event the relocation is unavoidable

8 Environmental Management Plan

The EIA shall include an Environmental Management Plan to prevent, mitigate and monitor each impact identified in the EIA. Plans will describe actions to be taken in sufficient detail to provide a basis for subsequent auditing of compliance with commitments made in the EIA process including who is responsible, how and when it will be implemented, what will be done and what results will be achieved, why it is being done, and how to know whether it is effective in addressing the underlying concerns. The Environmental Management Plan shall have the following elements:
8.1 Overview of Environmental Management Plan Organization and Policy

iv. Describe the project management and how environmental management and organization relates to overall project responsibility. Describe the personnel and performance accountability system for design, operation, maintenance and closure for implementation of mitigation and monitoring measures

v. Describe the environmental policy that will govern the Project throughout its implementation, including at least the objectives, scope, commitment to continuous improvement, control and environmental monitoring and good relationship with neighboring populations and countries, as well as the commitment to internal controls such as compliance and environmental monitoring and routine audits

vi. Identify the persons responsible for the implementation of mitigation measures, in each phase

8.2 Project-wide Mitigation Plan including an implementation schedule. It has two elements:

i. Environmental resource mitigation (such as air, water)

ii. Socio-economic-cultural mitigation (relocation, etc.)

8.3 Project-Wide Monitoring Plan (usually specific to monitoring of surface and ground water)

Short-term and long-term monitoring of resource condition, including but not limited to:

i. Slope stability

ii. Water Quality Monitoring Program
   a. Where, how and when monitoring shall be conducted
   b. Parameters to be monitored
   c. Monitoring frequencies
   d. Sampling and analytical protocols to be used

iii. Air Quality Monitoring Program
   a. Where, how and when monitoring shall be conducted
   b. The Parameters to be monitored
   c. The monitoring frequencies
   d. The sampling and analytical protocols to be used

iv. Noise and Vibration

v. Cultural, ceremonial archaeological and historic resources in the vicinity of the project

Short-term and long-term monitoring to ensure that the mitigation measures are functioning as predicted and that rehabilitation is working

8.4 Management of Other On-Site or Off-Site Environmental Pollution Control and Infrastructure

This section should address management of critical elements of pollution control and infrastructure that are not otherwise included in the mitigation plan because they were considered an essential part of the proposed project.

8.5 Contingency Plans

Contingency plans shall be prepared and described to address a) failure to meet specific performance criteria established by law or necessary for the project to meet its commitments in the EIA and b) respond to natural and other risks previously identified and mitigated in the EIA in the event reasonable and feasible mitigation measures to address the risks are inadequate.
i. Performance-related Contingency Plans, indicating the steps that will be taken should monitoring indicate that:
   a. Environmental standards are not being met
   b. Impacts are greater than predicted
   c. The mitigation measures and/or rehabilitation are not performing as predicted

ii. Natural Disaster Risk Response Plan (assumes that risk identification and risk reduction have been addressed in other parts of the EIA)

iii. Other Risks Response Plans (assumes that risk identification and risk reduction have been addressed in other parts of the EIA)

iv. Contingency plans for maintaining service or reducing downtime in the event of accidents or natural catastrophes that disrupt project operation

9 Signed Commitment Statement

The EIA shall contain a legally binding signed letter of commitment to meeting the terms of the EIA. The statement must be signed by the authorized representative of the proponent company with assurance that all financial surety measures as required by the regulatory agency have been met.

10 Annexes

These shall be numbered and duly referenced in the text

10.1 Public Consultation

   i. Public consultation plan
   ii. A summary of public outreach activities including: audience, number of persons, organizations involved, concerns raised, responses to comments
   iii. Summary of response to comments
   iv. Actual copies of written comments

10.2 Technical Supporting Documents

   i. Include maps, plans, charts and figures in the sequence mentioned in the EIA document
   ii. Zoning maps with resources and results of impacts
   iii. Special Studies if relevant but not readily accessible
   iv. Detailed materials on predictive tools/models and assumptions used for the assessment but too detailed for the body of the EIA

10.3 References

Submit a list of all references, (books, articles, technical reports and other information sources) cited in the various chapters of the EIA study with full biographic references, and the following conventional procedures cited in the literature: author, year, title, source, number of pages, and city of publication or issuance.
B. Forest Sector

1. Objectives of and Justification for the Proposed Project

Objectives

A statement of the general and specific objectives (purpose) of the proposed project, including whether it is a new project, an expansion of an existing project (e.g., increase in land area or increase in annual production) or modernization of an existing operation.

Justification for the Project

Provide a justification for the proposed project (need) highlighting the benefits to surrounding communities and economic development of the region and country.

2. Project Proponents

Provide the following information

i. Names, addresses, telephone numbers, and applicable legal documentation of proponents (including developers, major equipment suppliers if part of project team, shareholders and providers of financing, and representatives).

ii. Financial viability of the company (including a certified banking statement indicating that the company is financially stable and reputable).

iii. Forest tenure and ownership

3. Project Team

The types of professionals included in the team shall be appropriate to the type of project and the type of environment in which the project is located. Report on the following:

i. Structure and staffing of team responsible for sustainable forest management

ii. Number of professional and technical personnel at all levels to perform and support forest management

iii. Existence of communication strategies and feedback mechanisms to increase awareness of sustainable forest management

iv. The team’s ability to apply appropriate technology to sustainable forest management and the efficient utilization and marketing of forest products

4. Legal and Regulatory Framework

Provide any policy, legal or administrative issues that may have an impact on the proposed development.

i. Existence and implementation of policies, laws and regulations to govern forest management

ii. Forest tenure and ownership
iii. Evidence of any economic instruments that will encourage sustainable forest management

iv. Define the legal framework, complete listing and summarizing requirements or alternatives used as benchmarks, and evidence of non-applicability or compliance, including:
   a. required regulatory approvals and/or permits for all stages and their status applicable plans
   b. applicable natural resource management or protected area management plans and responsible agency(ies) (demonstrate conformity and compliance with all applicable plans)

5. **Project and Alternatives Description**

The project proponent shall submit a full description and location of the proposed project and reasonable alternatives including ancillary facilities and operations such as the logging camp/housing, headquarters buildings wood processing area, roads, sanitary services, waste disposal, transportation infrastructure and fuel storage.

6. **Location**

The general location of the project and associated activities in terms of:

i. Political-administrative location (region, district, town or other relevant political administrative units) with accompanying location map

ii. Means of site access – i.e., by air, river, road, or vehicle

iii. Latitude and longitude of project area

iv. Maps of project area at a scale of no less than 1:50,000 but preferably 1:25,000 or as required by the regulatory agency

v. Project plan and location – indicate the project area and the direct and indirect areas of influence for the physical, biological and social-economic-cultural impacts

vi. All drawings should present scale and key coordinates or benchmarks as
   a. latitude/longitude, Universal Transverse Mercator (UTM) coordinates, or
   b. local survey plate that can be cross-referenced to latitude/longitude

7. **Summary of Proposed Project and Alternatives**

All project alternatives that are reasonable and feasible and meet the purpose and need for the proposed project shall be identified. In addition to the proposed project, such alternatives include alternative locations, alternative fuels, alternative site configuration of elements of the project, alternative size and output capacity, and alternative plans for construction; best practices that may avoid and/or reduce the adverse impacts to the physical, biological or social-economic-cultural environments. If the project area or the buffer zone of the project area for an alternative is in an ecologically fragile area, the description of the alternative must include a clear justification for not opting for another site.
8.  **Land Use**

Actual and potential showing location, size and proximity within and surrounding the project area, including land use maps, and to extent possible, integrated into one map.

9.  **Forest Baseline Assessment**

Please provide information on the following:

i. Extent (area) and percentage of total land area under comprehensive land-use plans

ii. Extent (area) of forests committed to production and protection

iii. Extent (area) and percentage of total land area under each forest type

iv. Percentage of PFE with boundaries physically demarcated

v. Changes in forested area

vi. Forest condition

vii. Extent and nature of forest encroachment, degradation and disturbance caused by humans and the control procedures applied

viii. Extent and nature of forest degradation and disturbance due to natural causes and the control procedures applied

10. **Forest Production**

Please provide information on the following:

i. Extent and percentage of forest for which inventory and survey procedures will be used to define the quantity of the main forest products

ii. Projected sustainable harvest of wood and non-wood forest products

iii. Expected composition of harvest

iv. Projected extent of compartments/coupes to be harvested

v. Total amount of carbon stored in forest stands

vi. Any plans to salvage and convert forest waste into products and energy

vii. Existence and implementation of:

   a. forest harvesting/operational plans (within forest management plans); and

   b. other harvesting permits (small-, medium- and large-scale permits without forest management plans)

11. **Project and Alternatives Details**

Provide specific project details for the proposed project and each alternative. The level of detail presented shall be the same for the proposed project and each alternative evaluated.

The following project details shall be provided:

i. General Information

ii. Type and nature of the project-Type (plantation, forest concession etc)
iii. Scope of the project: Number of hectares in total, amount committed to production and protection forest, percentage of land area under each forest type, changes in forest area and forest condition,
iv. Flow diagram for the operation of the project showing the phases of the project, the production and processing of forest resources and their relationships to each other,
v. General plan for the facilities, showing the location and layout of all project infrastructure

I. Project operations
   i. description of how the project would operate (seasonally, monthly, daily, hourly, as appropriate)
   ii. establishment and construction phase and timetable
   iii. schedule for each phase of project establishment including construction of facilities and demarcation of boundaries and annual coupes including, but not limited to:
      a. Resource Mobilization
      b. Access road construction and improvements
      c. Land clearing for construction of welfare and industrial facilities
      d. Borrow and spoil disposal
      e. Erosion and sediment control
      f. Extent of any forest inventory
      g. Extent of compartments/logging coupes
      h. Expected actual and sustainable harvest of wood and non-wood products
      i. Forest management plans and other plans

II. A GANTT or critical path management chart for the entire project, from start to finish

III. Equipment
   i. Equipment Roster specifying type and quantity by size, weight, motor size, and fuel requirements for each piece of equipment or machinery
   ii. Transportation mobilization and mobilization frequency
   iii. Machinery and equipment mobilization routes to be used, as well as the features of the ways on which they will be transported, including a map of routes, as applicable, and mobilization.

12. Environmental Setting
Environmental setting for the different types of physical, biological and social-economic-cultural environments for the current situation, important trends and predicted situation in the absence of the proposed project. Indicate the direct and indirect and cumulative impact areas of influence for physical, biological, and social-economic-cultural impacts and basis for defining area.
13. Biological Environment

I. Provide detailed information on the location and condition of ecosystems in and around the project area in the form of narrative, maps and tables, including the following:
   i. Vegetative mapping of terrestrial and wetland habitats (aquatic and marine if appropriate) for project area, and any downstream area affected by the project
   ii. Species and structure (abundance, density, status, plant communities, presence of invasive species, etc.)
   iii. Aquatic and terrestrial wildlife/fauna
   iv. Fish and aquatic resources
   v. Extent and location of spawning, rearing, feeding and wintering habitat Wildlife Resources Species (including status, i.e., endemic, migratory, exotic, endangered, threatened, keystone, etc.), life history, and seasonal use
   vi. Procedures to identify and protect endangered, rare and threatened species of forest-dependent flora and fauna
   vii. Report on any endangered, rare and threatened forest-dependent species

14. Biological conservation in production Forest

i. Describe the procedures for the protection and monitoring of biodiversity in production forests as follows:
   a. retaining undisturbed areas;
   b. protecting rare, threatened and endangered species;
   c. protecting features of special biological interest (e.g., nesting sites, seed trees, niches, keystone species, etc.); and
   d. assessing recent changes in (a), (b) and (c) above through inventories, monitoring/assessment programs and comparison with control areas

ii. Extent and percentage of production forest that has been set aside for biodiversity conservation

15. Protected Areas and Biological Corridors

i. Identify on maps the specific locations and boundaries of relevant national parks, sanctuaries, reserves, etc., as well as any areas proposed for protection

ii. Identify and describe any biological corridor connection between protected areas

16. Soil and Water Resources

Please provide the following information on water resources:
   i. Extent and percentage of total forest area managed exclusively for the protection of soil and water
   ii. Procedures to ensure the protection of downstream catchment values
   iii. Procedures to protect soil productivity and water retention capacity within production forests
iv. Procedures for forest engineering, including:
   a. drainage requirements;
   b. conservation of buffer strips along streams and rivers;

Describe potential impacts to soil resources:
   i. Soil quality
   ii. Contamination (accidental spills of fuel, oil or other hazardous substances)
   iii. Impacts on use
      a. protection of soils from compaction by harvesting machinery; and
      b. protection of soil from erosion during harvesting operations
      c. Extent and percentage of areas in production PFE that have been defined as environmentally sensitive (e.g. very steep or erodible) and protected
   iv. Erosion, slope alteration, vegetation removal and drainage patterns
   v. defining the areas with high erosion potential
   vi. Sediment accumulation and transport
   vii. Sediment and hazardous waste removal and disposal if any
   viii. Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

17. Waste Management

1. Determine the nature and volumes of all types of wastes and other by-products, to be generated by the proposed forest developmental including domestic waste, timber waste, milling waste if any, plant debris etc.

2. Evaluate alternative options for the collection, treatment, recycling (if appropriate), and disposal of these wastes. Identify any chemicals planned for use in the treatment or management of these wastes.

3. Identify the preferred option(s) for waste management/disposal method based on environmental grounds, including necessary infrastructure. Specify any residual impacts of waste management, their significance, and any mitigation measures to be undertaken.

18. Social-Economic-Cultural Environment

Identify nearby human settlements including the following information for each settlement:
   i. Population (size, gender and age distribution)
   ii. Cultural characteristics (religion, ethnic composition, languages spoken, etc.)
   iii. economic activities (employers, employment and incomes)
   iv. Number of people depending on forests for their livelihoods
   v. Training, capacity-building and manpower development programs for forest workers
   vi. Existence and implementation of procedures to ensure the health and safety of forest workers
vii. Area of forests upon which people are dependent for subsistence uses and traditional and customary lifestyles

viii. Number and extent of forest sites available primarily for:
   a. research and education; and
   b. recreation

Community and indigenous peoples’ rights and participation
   i. information on indigenous people or other traditional cultures, if any
   ii. Extent to which tenure and user rights of communities and indigenous peoples over publicly owned forests are recognized and practised
   iii. Extent to which indigenous knowledge is used in forest management planning and implementation
   iv. Extent of involvement of indigenous peoples, local communities and other forest dwellers in forest management capacity-building, consultation processes, decision-making and implementation

19. Infrastructure

For each human settlement identified, describe the infrastructure in or serving the settlement, including the following information:
   i. Transportation infrastructure
   ii. Infrastructure for energy generation
   iii. Infrastructure for energy storage

20. Cultural, Archeological, Ceremonial and Historic and Resources

Provide information on the following:
   i. Any features of archaeological or cultural importance within the project area
   ii. Show how the project will, modify its activities to avoid significant archaeological, cultural, ceremonial and historic sites
   iii. If avoidance is not possible, show how the project will conduct appropriate resource recovery operations before disturbing the sites
   iv. Show what methods the project will use to identify existing archaeological, cultural and historic sites on roadsides and within the project area boundaries so that they are easily recognized by the machinery operators and other workers

21. Public Consultation

   i. Public consultation plan
   ii. Summary of public outreach activities including: audience, number of persons, organizations involved, concerns raised, responses to comments
iii. Copies of written comments

22. **Assessment of Impacts**

Provide information on potential impacts (direct, indirect and cumulative) and the magnitude and frequency of potential impacts on physical, biological, economic-cultural resources resulting from construction, operation and closure of the proposed project and alternatives.

23. **Project-wide Mitigation Plan including an implementation schedule.**

i. environmental resource mitigation (such as soil, water)
ii. socio-economic-cultural mitigation (road rehabilitation dust, etc.)

24. **Technical Supporting Documents**

i. Zoning maps with resources and results of impacts
ii. Special Studies if relevant but not readily accessible
iii. Detailed materials on predictive tools/models and assumptions used for the assessment

25. **Mitigation and Monitoring Plan**

1. Based on the investigations, develop a mitigation matrix outlining mitigation measures for all potential negative environmental impacts.
2. Provide a monitoring plan to be implemented for the entire operation.
C. Water Sector

1. Water Resources
   i. Surface water
   ii. Names and locations on maps of all permanent and intermittent streams, rivers, wetlands, lakes and reservoirs within the area of influence
   iii. River mile designation or other reference point for the intake and discharge points of the project (if project will be using surface water for cooling)
   iv. The monthly minimum, mean and maximum recorded flows of the river at the diversion point
   v. A monthly flow duration curve (i.e., flow exceedance curve) indicating the period of record and location of gauging stations where data were gathered to derive the curves
   vi. Seasonal fluctuations in area and volume of wetlands, lakes and reservoirs
   vii. For any proposed or existing cooling ponds, surface area, volume, maximum depth, mean depth, flushing rate, shoreline length, substrate composition
   viii. Delineation of watersheds and water drainage pattern in the area of influence using cadastral/aerial/remote sensing satellite imageries (map)
   ix. Runoff characteristics of watersheds
   x. Inventories of consumptive and non-consumptive use, especially those who are in the floodplain between intake and discharge points and downstream of the discharge (if project will be using surface water for cooling)
   xi. Surface water balance (if project will be using surface water for cooling)
   xii. Existing uses by type and volume
   xiii. Groundwater (if project will be using groundwater for cooling and/or cooling ponds)
   xiv. Provide a map and identify and describe aquifers and underground waters adjacent to the project, indicating the depth of the water table along with trend data

2. Hydro geologic characteristics of the area (vadose zone and aquifers)
   i. Flow regime
   ii. Flow direction

3. Influences of geologic structures (faults, contacts, bedrock fracturing, etc) and surface water bodies

4. Location and characteristics of all existing springs and wells in the area of influence (on topographic map)
   i. flow/yield data for each spring and well (including water levels in wells)
ii. depth and construction information for each well
iii. existing uses by type and volume
iv. capacity available
v. groundwater recharge data
vi. groundwater potential yield
vii. availability
viii. water table levels (dry and rainy season)

5. Water quality (if project will discharge cooling water and/or will use cooling ponds)
   i. existing water quality data
   ii. locations of all water quality monitoring stations in and around the project area (with direction and distance from the site)
   iii. water quality data for each station for those parameters likely to be affected by project construction, operation, or maintenance
   iv. physical, chemical and biological water quality characteristics, including water temperature and dissolved oxygen concentrations for any proposed or existing cooling ponds water temperature and dissolved oxygen concentrations, including seasonal vertical profiles
   v. supplemental sampling and analysis (if existing data is not adequate to characterize water quality)
   vi. water quality information upstream of the location of water intake, at the point of discharge and downstream from discharge point

6. Proposed locations of representative monitoring stations upstream and downstream of proposed project activities
   i. monitoring program design with at least a year of baseline data being collected
   ii. parameters (including as appropriate, physical, chemical and biological)
   iii. frequency of collection

7. Analytic methods
   i. Surface water and groundwater standards that apply to the project
   ii. Current uses
   iii. standards for current uses (in the absence of such standards, identify a set of benchmarks used in the analysis)

8. Quality
   i. Water Quality Management Plan (summary of relevant measures with full document in Annex)
   ii. cooling water discharges
iii. sewage and domestic wastewater
iv. nonpoint sources – runoff, erosion and sediment control prevention measures
v. prevention and Containment Plan
vi. solid Waste Management Plan
vii. hazardous Waste Management Plan

9. **Transport system construction and maintenance to avoid erosion and sedimentation including:**
   i. elevation or rerouting
   ii. design for proper run-off control and catchment
   iii. provision of culverts to allow flow that might otherwise be impeded by roadways or other rights of way
   iv. appropriate traffic control

10. **Potential impacts to surface water and groundwater resources shall be described including but not limited to the following:**
   i. Geomorphology
   ii. Location of all stream or wetland crossings by right-of-ways and access roads.
   iii. Modification/diversion in the existing drainage pattern
   iv. Downstream scouring and upstream head cutting
   v. Bank erosion (surface water discharges, stream crossings and dredging)
   vi. Potential for increased flash flooding

11. **Aquatic and Terrestrial Wildlife/Fauna and Associated Ecosystems**
    Describe and quantify alterations in aquatic and terrestrial wildlife populations due to:
    i. Fish and Aquatic Resources
    ii. Loss in habitat (e.g., spawning, rearing, juvenile, or adult habitats) from changes in water quality (temperature, dissolved oxygen and other parameters) and instream flow
    iii. Disturbance of aquatic resources during construction, operations, or maintenance activities, including equipment noise, erosion and sedimentation, vehicular movements, or blasting
    iv. Entrainment and mortality effects on fish populations from water intakes for cooling water

12. **Wildlife Resources**
    i. Loss of habitat, migratory routes/corridors, and breeding areas due to changes in vegetative cover/wetlands loss
    ii. Disturbance of habitat, migratory routes/corridors and breeding areas due to project construction, operation, and maintenance, recreational use, and human settlement associated with the project (e.g., noise, vibration, illumination, vehicular movement)
13. **Endangered or Threatened Species or Habitats**
   
   i. Describe and quantify impacts to endangered or threatened species or habitats
   
   ii. Biodiversity
   
   iii. Individual species (with special emphasis on endemic, rare, threatened and endangered species)
   
   iv. Overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

14. **Protected Areas**

   **I. Social-Economic-Cultural Impacts**

   Assess potential positive and negative impacts to social economic-cultural resources including but not limited to the following:

   i. increased individual incomes
   
   ii. direct employment at the project

   **II. Cultural, Archeological, Ceremonial and Historic and Resources**

   i. destruction during construction
   
   ii. damage and alteration
   
   iii. removal from historic location
   
   iv. introduction of visual or audible elements that diminish integrity
   
   v. neglect that causes deterioration
   
   vi. loss of medicinal plants
   
   vii. loss of access to traditional use areas
   
   viii. impacts to previously inaccessible resources from development/improvement of roads
   
   ix. overall assessment of significance of direct, indirect and cumulative impacts for all phases of the proposed project based upon analysis of magnitude, frequency, scope and duration in context

15. **The monitoring plan**

    The plan must include monitoring throughout the life of the project for each potential mitigation to confirm the effectiveness of the measure and support contingency plans to provide assurance that the project, at the site preparation, construction, operation, expansion, and closure stages will meet applicable environmental requirements/standards by law, and fall within the limits of impacts deemed acceptable.

    Monitoring plans should include, but are not limited to the following:

    **I. Physical Impacts**
i. geologic Resources and Hazards
ii. pre-excavation, onsite geological inspection and geotechnical study protocols to determine slope stability and landslide risks
iii. slopes built and maintained to avoid landslides and favor revegetation and soils formation
iv. slope stabilization by constructing retaining walls, using vegetation, geotextile membranes, or other mechanical methods
v. blasting Plan, if applicable
vi. use of signage to mark areas where slopes are not stable as a preventive measure in the event of a landslide
vii. mitigation measures unique to specific alternatives

II. Social-Economic-Cultural Impacts

16. Socio-Economic Conditions

Selection of an alternate site for the project, and if not possible then adhering to requirements of an internationally recognized Resettlement Action Plan (RAP)
   i. Rehabilitation Program for people displaced by the project
   ii. Training local residents for employment in the project
   iii. Development of a “Code of Conduct” (with associated training program) for workers to show respect to the local populations and their culture and social rules
   iv. Measures proposed to protect public from failure of proposed facilities
   v. Design and operational measures to avoid or reduce risk
   vi. Measures to exclude public from hazardous areas
D. Energy Sector

1. Objectives of and Justification for the Proposed Project

Objectives

A statement of the general and specific objectives (purpose) of the proposed project, including whether it is a new project, an expansion of an existing project (e.g., increase in land area or increase in annual production) or modernization of an existing operation.

Justification for the Project

Provide a justification for the proposed project (need) highlighting the benefits to surrounding communities and economic development of the region and country.

2. Project Proponents

i. Names, addresses, telephone numbers, and applicable legal documentation of proponents (including developers, major equipment suppliers if part of project team, shareholders and providers of financing, and representatives).

ii. Financial viability of the company (including a certified banking statement indicating that the company is financially stable and reputable).

3. Project Team

The types of professionals included in the team shall be appropriate to the type of project and the type of environment in which the project is located and may include (but not be limited to) engineers, architects, biologists, geologists, hydrologists, air quality experts, archeologists, anthropologists, sociologists and economists.

4. Legal and Regulatory Framework

i. define the legal framework under, complete listing and summarizing requirements or alternatives used as benchmarks, and evidence of non-applicability or compliance, including:
   a. Required regulatory approvals and/or permits for all stages and their status applicable plans).
   b. Applicable natural resource management or protected area management plans and responsible agency(ies) (demonstrate conformity and compliance with all applicable plans).

5. Project and Alternatives Description

The project proponent shall submit a full description and location of the proposed project and reasonable alternatives including ancillary facilities and operations such as the camp/housing for
construction and operation phases, borrow and disposal areas, sanitary services, waste disposal and transportation infrastructure:

6. **Location**

The general location of the project and associated activities in terms of:

i. Political-administrative location (region, district, town or other relevant political administrative units) with accompanying location map

ii. Means of site access – i.e., by air, river, road, or vehicle

iii. Latitude and longitude of project area

iv. Maps of project area at a scale of no less than 1:50,000 or as required by the regulatory agency

v. Project plat plan and location – indicate the project area and the direct and indirect areas of influence for the physical, biological and social-economic-cultural impacts

vi. All drawings should present scale and key coordinates or benchmarks as
   a. latitude/longitude, Universal Transverse Mercator (UTM) coordinates, or
   b. local survey plate that can be cross-referenced to latitude/longitude

7. **Summary of Proposed Project and Alternatives**

All project alternatives that are reasonable and feasible and meet the purpose and need for the proposed project shall be identified. In addition to the proposed project, such alternatives include alternative locations, alternative fuels, alternative site configuration of elements of the project, alternative size and output capacity, and alternative plans for construction; best practices that may avoid and/or reduce the adverse impacts to the physical, biological or social-economic-cultural environments. If the project area or the buffer zone of the project area for an alternative is in an ecologically fragile area, the description of the alternative must include a clear justification for not opting for another site.

8. **Project and Alternatives Details**

Provide specific project details for the proposed project and each alternative. The level of detail presented shall be the same for the proposed project and each alternative evaluated. The following project details shall be provided:

i. General

ii. Type and nature of the project-Type (wind, solar thermal, solar photovoltaic, solar, geothermal)

iii. Capacity: maximum, minimum and average power output as MW, and as MWhrs by month and season

iv. Flow diagram for the generation of power showing all components of the plant and their relationships to each other

v. General plan for the facility, showing the location and layout of all project
I. Project operations

i. description of how the project would operate (seasonally, monthly, daily, hourly, as appropriate)

ii. construction phase and timetable

iii. schedule for each phase of construction for all project and ancillary facilities including, but not limited to:
   a. Mobilization
   b. Road construction and improvements
   c. Land clearing
   d. Drilling
   e. Blasting
   f. Borrow and spoil disposal
   g. Erosion and sediment control
   h. Excavation and sub grade preparation
   i. Foundation preparation
   j. Concrete work
   k. Construction or installation of each project facility
   l. Stabilization of disturbed areas

II. A GANTT or critical path management chart for the entire project, from start to finish

III. Equipment

i. Equipment Roster specifying type and quantity by size, weight, motor size, and fuel requirements for each piece of equipment or machinery

ii. Transportation mobilization and mobilization frequency

iii. Machinery and equipment mobilization routes to be used, as well as the features of the ways on which they will be transported, including a map of routes, as applicable, and mobilization.

9. Environmental Setting

Environmental setting for the different types of physical, biological and social-economic-cultural environments for the current situation, important trends and predicted situation in the absence of the proposed project. Indicate the direct and indirect and cumulative impact areas of influence for physical, biological, and social-economic-cultural impacts and basis for defining area.

10. Biological Environment

Provide detailed information on the location and condition of ecosystems in and around the project area in the form of narrative, maps and tables, including the following:
i. vegetative mapping of terrestrial and wetland habitats (aquatic and marine if appropriate) for project area, including in the area of transmission lines and any downstream area affected by the project

ii. species and structure (abundance, density, status, plant communities, presence of invasive species, etc.)

iii. aquatic and terrestrial wildlife/fauna

iv. fish and aquatic resources

v. identification of fish, mussel, macro invertebrate and other aquatic species

vi. extent and location of spawning, rearing, feeding and wintering habitat Wildlife Resources Species (including status, i.e., endemic, migratory, exotic, endangered, threatened, keystone, etc.), life history, and seasonal use

11. **Protected Areas**

Identify on maps the specific locations and boundaries of relevant national parks, sanctuaries, reserves, etc., as well as any areas proposed for protection.

12. **Social-Economic-Cultural Environment**

Identify nearby human settlements including the following information for each settlement:

i. Population (size, gender and age distribution)

ii. Cultural characteristics (religion, ethnic composition, languages spoken, etc.)

iii. economic activities (employers, employment and incomes)

13. **Infrastructure**

For each human settlement identified, describe the infrastructure in or serving the settlement, including the following information:

i. Transportation infrastructure

ii. Roads

14. **Cultural, Archeological, Ceremonial and Historic Resource**

Identify all cultural, archaeological, ceremonial and historic resources within the area of influence, including the following information:

i) data and maps relating to archaeological, cultural, ceremonial, and historic sites in the direct vicinity of the project.

ii) information on indigenous people or other traditional cultures, if any.

15. **Land Use**
Actual and potential showing location, size and proximity within and surrounding the project area, including land use maps, and to extent possible, integrated into one map.

16. **Assessment of Impacts**

Provide information on potential impacts (direct, indirect and cumulative) and the magnitude and frequency of potential impacts on physical, biological, economic-cultural resources resulting from construction, operation and closure of the proposed project and alternatives.

17. **Physical Impacts**

Potential impacts to geologic resources and potential effects on facility shall be described.

18. **Soil Resources**

Potential impacts to soil resources shall be described:
- Soil quality
- Contamination (accidental spills of fuel, oil or other hazardous substances)
- Disposal of heat transfer fluids and component parts of photovoltaic cells
- Impacts on use
- Erosion, slope alteration, vegetation removal and drainage patterns
- Models for soil erosion should be included using methods like USLE
- defining the areas with high erosion potential
- Sediment accumulation and transport
- Sediment and hazardous waste removal and disposal
- Overall assessment of significance of direct, indirect and cumulative impacts for
- all phases of the proposed project based upon analysis of magnitude, frequency
- scope and duration in context

19. **Cultural, Archeological, Ceremonial and Historic and Resources**

- Modify facility and activity locations to avoid significant archaeological, cultural, ceremonial and historic sites
- if avoidance is not possible, conduct appropriate resource recovery operations before disturbing the sites
- Clearly delineate boundaries and post signs identifying existing archeological, cultural and historic sites on roadsides and within the project area boundaries so that they are easily recognized by the machinery operators and other workers

20. **Project-wide Mitigation Plan including an implementation schedule.**

- environmental resource mitigation (such as air, water)
ii. socio-economic-cultural mitigation (relocation, etc.)

21. **Public Consultation**
   i. public consultation plan
   ii. a summary of public outreach activities including: audience, number of persons, organizations involved, concerns raised, responses to comments
   iii. summary of response to comments
   iv. actual copies of written comments

22. **Technical Supporting Documents**
   i. Zoning maps with resources and results of impacts
   ii. Special Studies if relevant but not readily accessible
   iii. Detailed materials on predictive tools/models and assumptions used for the assessment

E. **Mining Sector**

**EXECUTIVE SUMMARY OF THE EIA**

The executive summary should summarize the overall benefits of the project, highlight the major environmental findings and how these will be managed to prevent, reduce or rehabilitate adverse impacts. The overall closure and post-mining land capability objectives should be stated clearly.

**TABLE OF CONTENTS OF THE EIA REPORT**

**PART 1: BRIEF PROJECT DESCRIPTION**

1.1 Name and address of the applicant for, or holder of, prospecting/mining license of mineral concession.
1.2 Prospecting/mining License number.
1.3 Name of Mineral(s) covered by the Prospecting/ mining License.
1.4 Name and Address of the Owner of the Land and The Title Deed Description of the Land
1.5 Regional Setting (Plan or Aerial Photograph Required)
   1.5.1 Direction and Distance of neighbouring settlements
   1.5.2 Surface Infrastructure (such as roads, and power lines in the vicinity) within 2 km radius of the lease area.
1.5.3 Land tenure and use of immediately adjacent land
1.5.4 The name of the river catchment in which the mine is situated

1.6 Description of the proposed project

A very brief description of the project is required here.

Mineral Deposit

1.6.1 Mine product(s) or prospecting target mineral(s)
1.6.2 Estimated reserves or extent of target area
1.6.3 Proposed prospecting or mining method(s) (e.g. open cast, underground, long wall, extensions to existing mine, etc)
1.6.4 Estimated life of the project, planned production rate, estimated capital employed and Expected employment.

PART 2: MOTIVATION OF PROPOSED PROJECT

2.1 Benefits of the project

A brief indication of the following is required for the project:

2.1.1 Where it is intended that the product(s) will be sold (if already mining).
2.1.2 An estimate of the expenditure to bring the project into production.
2.1.3 An estimate of the total annual expenditure at full production.
2.1.4 An estimate of the employee strength at full production (if already mining).
2.1.5 An estimate of the multiplier effect on the local, regional and national economy.

2.2 Consideration of project alternatives

The major project alternatives and their impact on the environment that were considered prior to the compilation of the EMP should be recorded. Such alternatives may include:

2.2.1 Mining method.
2.2.2 Mineral processing method.
2.2.3 Transport, power and water supply routes.
2.2.4 Sources of water.
2.2.5 Mine infrastructure sites.
2.2.6 Mine residue disposal sites.
2.2.7 Domestic and industrial waste disposal sites.
2.2.8 Housing sites.
2.2.9 Land use options after rehabilitation.
2.2.10 The "No project" option.

PART 3: DESCRIPTION OF THE PRE-MINING ENVIRONMENT

The approach for this section should be to describe in general the regional setting and then describe in detail the project area or site. For instance,

3.1 Geology
3.1.1 Describe in general the regional geology of the project area.
3.1.2 Describe in detail the study area, geological structures and formation, and mineralogical evaluation.
3.1.3 Identify the position of the ore body, the tenement boundaries, and alternatives for location of mining infrastructure.
3.1.4 Geology (include where appropriate representative borehole logs, a section through the ore body and surface mapping. Identify and characterize overburden material that will be disturbed and which, once disturbed, may adversely affect water quality).
3.1.5 Describe surface material and bedrock characteristics of the development area.

3.2 Climate
3.2.1 A brief description of the regional climate.
3.2.2 Mean monthly and annual rainfall for the site and number of days per month with measurable precipitation.
3.2.3 Maximum rainfall intensities per month.
3.2.4 Mean monthly, maximum and minimum temperatures for the past three years.
3.2.5 Monthly mean wind direction and speed - where appropriate hourly wind direction and speed, with the maximum one minute speed in each hour for the past three years, may be required.

3.3 Topography
Provide a topographic map of the development area at an appropriate scale with surface contours at an appropriate interval and describe topographic patterns and landforms with regard to elevation, relief, and aspect.

3.4 Soil
A description of the soil types to be disturbed, their fertility, erodability and depth should be provided and the soils should be mapped according to a recognized soil classification system.

3.5 Pre-mining land capability
3.5.1 Provide inventories and evaluations of land capabilities in the proposed lease area, including, as appropriate, the following categories: agriculture, forestry, wildlife, fisheries, recreation, Archaeological and cultural sites.
3.5.2 For the various land capabilities describe, document the area and location of the capacity classes to be disturbed by the project.

3.6 Ecology (Natural Vegetation/Plant Life within 2 km Radius of the Proposed Lease Area)
3.6.1 Describe and map the regional vegetation and document the dominant species.
3.6.2 Endangered or rare species.
3.6.3 Illustrate the location and document the area of the various vegetation types and forest types that will be disturbed by the project.

3.7 Animal Life

3.7.1 Provide an inventory of wildlife resources in the development area, including items such as species, composition, distribution and abundance
- Rare or endangered species
- Migration route and staging areas
- Habitat evaluation, distribution, and utilization; critical habitat
- Regional and local significance of populations
- Sensitivity to disturbance

3.7.2 Document the type, location, quantity and capability of habitat that will be disturbed or lost as a result of the project.

3.8 Surface Water

3.8.1 The following are to be indicated on a plan:
   i. Streams and rivers
   ii. Ponds and lakes
   iii. Dams
   iv. Position of the estimated maximum flood-line for the 1 in 50 year flood event

3.8.2 Surface Water Quantity
   i. A map at an appropriate scale indicating the catchment boundaries,
   ii. Flood peaks and volumes for recurrence intervals of 1:20 and 1:50 years and the regional maximum flood.

3.8.3 Surface water Quality
An analysis of surface water samples in sufficient detail to characterize the water quality in the affected water course(s).

3.8.4 Wetlands
Location of wetlands on the property, the extent thereof and an indication of the significance and the biological diversity of the wetland.

3.9 Ground Water

3.9.1 Depth of water table(s).
3.9.2 Presence of water boreholes and springs and their estimated yields (Plan required).
3.9.3 Ground water quality.
Analyze water in boreholes and springs in the affected zone so as to be able to characterise the water quality.

3.9.4 Ground water use.
Identify, where possible, ground water and spring water users in the study area and the quantities used.

3.9.5 Ground water zone.
The ground water zone which is likely to be affected by the mining operation (the affected zone) should be identified. Its importance as a regional resource should be described. If available, maps at appropriate scales should be provided indicating the ground water zone boundaries.

3.10 Air Quality
A survey of the air quality and existing sources of air pollution in the area should be made including fallout dust, suspended dust and gaseous emissions (only if the project includes a scheduled process, as defined in the Atmospheric Pollution (Prevention) Act).

3.11 Noise and Vibration
Existing noise levels on and around the property should be identified as well as potential noise impact sites. If the potential impacts warrant it, pre-mining noise monitoring may be required. Similar exercise should be done for vibration.

3.12 Archaeological and Cultural Aspects

3.12.1 Conduct a baseline survey to identify and describe archaeological sites in the study area.
3.12.2 Examine monuments and site records held by National Institute of Culture and History
3.12.3 Sites of recognized archaeological and cultural interest should be described and shown on a plan.

3.13 Sensitive Landscapes and Protected Areas
If sensitive landscapes enjoying statutory protection occur on the site these should be described and shown on a plan.

3.14 Visual Aspects
Describe the visibility of the project site from scenic views, tourist routes and existing residential areas.

3.15 Regional and Socio-Economic Structure
Local or national regions could be considered depending on the nature of the project.

3.15.1 Population density, growth and location.
3.15.2 Major economic activities and sources of employment.
3.15.3 Unemployment estimate for the area.
3.15.4 Housing demand, availability.
3.15.5 Social infrastructure - schools, hospitals, sporting and recreational facilities, shops, police, civil administration.
3.15.6 Water supply.
3.15.7 Power supply.

3.16 Public Consultations

3.18.1 Identify and list known interested and affected parties and their representatives. This may be done in consultation with the relevant authorities.

3.18.2 Conduct public consultations with interested and affected parties as well as key stakeholders to establish the following:
   • Dissemination of project information to all the affected communities and interested parties, updating them on progress made and eliciting their views on the project.
   • To establish environmental issues of public concern

PART 4: DETAILED DESCRIPTION OF THE PROPOSED PROJECT

4.1 Surface infrastructure (Plan required)

The proposed major surface infrastructure required for the mine should be described briefly and shown on a topographical plan. This should include:

4.1.1 Roads, power lines and access routes to and within the plant.
4.1.2 Solid waste management facilities.
   • Industrial and domestic waste disposal sites.
   • Mine residue disposal sites. Give or show on the plan the type of residue, final extent of the dumps, construction method and water reticulation layout.
4.1.3 Water pollution management facilities.
   • Sewage plant location, its design capacity and the process to be used.
   • Pollution control dams, paddocks and evaporation dams. Indicate if these are to be lined or not.
   • Polluted water treatment facility, its design capacity and process to be used.
4.1.4 Potable water plant location, its design capacity and the process to be used.
4.1.5 Process water supply system, its design capacity and the process to be used.
4.1.6 Mineral processing plant.
4.1.7 Workshops, administration and other buildings.
4.1.8 Housing, recreation and other employee facilities.
4.1.9 Show the water supply source(s) and the water discharge point(s).
4.1.10 Indicate the storm water diversion measures designed to separate clean from contaminated water.

4.2 Construction phase

4.2.1 A brief description of the activities during this period is required, including a plan if necessary.

4.2.2 Direct employment during construction possible influx of labor and stress on public utilities and services

4.2.3 Use of water and power and its source during construction, proposed earth moving, dredging and drilling operations

4.2.4 Proposed plan for transportation and storage of construction material.

4.2.5 Detailed schedule of activity and resource requirements.

4.2.6 Disposal of solid waste/dredged material.

4.3 Operational phase

4.3.1 Mineral processing.

A brief description of the mineral processing method is required. This description should highlight areas in the plant that could generate air, water and noise pollution.

4.3.2 Plant residue disposal.

A brief description of the disposal method(s) giving tons disposed per day at full production for each type of residue.

4.3.3 Transport.

A brief description of how the raw material and final products will be transported (to their point of sale inland or port of export) is required.

4.3.4 Proposed river or stream diversions.

Depending on the importance and timing of the diversion and its potential impact on the environment, the following information may be requested.

- Topographical plans covering the original alignment and the new alignment.
- Details of any linings or erosion control measures.
- Details of points where storm water is expected to enter the diversion and the associated erosion control measures.

PART 5: ENVIRONMENTAL IMPACT ASSESSMENT
The mining proponent will be expected to demonstrate that he has considered and understood the potential or anticipated impacts of the project on the environmental components described in Part 2. Therefore an estimate of the nature of these impacts should be given for the construction, operational and decommissioning phases.

When describing the impacts see guidelines in Chapter 6 of this report.

5.1 Construction phase

Describe the impacts on the environment to be expected during the construction phase of the project.

5.1.1 Geology

Potential dilution and sterilization of the ore reserves

5.1.2 Topography

- Some facilities such as waste dumps and tailings storage facilities are major permanent changes to the landscape and the design, and location of these structures requires special consideration.
- The impact the project will have when viewed from scenic views, tourist routes and existing residential areas should be assessed as well.

5.1.3 Land

Special consideration should be considered to changes in land use, drainage pattern, soil, land quality including effects of waste disposal, riverbanks and their stability.

5.1.4 Biological (Natural Vegetation, Plant and Animal Life)

Deforestation/tree-cutting and shrinkage of animal habitat, impact on fauna and flora due to contaminants/pollutants, impact on rare and endangered species, endemic species, and migratory path/route on animals and impact on breeding grounds should be assessed.

5.1.5 Surface Water.

When assessing surface and ground water impacts, two overriding questions must be asked: Will the project significantly change either the catchment yield or the water quality in the catchment? If the answer to one or both questions is yes, an effort must be made to determine the magnitude and nature of the impact.

5.1.6 Ground water.

Include an assessment of the impacts in the affected zone of mining activities on ground water and the impact on ground and surface water users.

5.1.7 Air quality.

Air quality prediction should go up to a distance where the ambient air quality standards are not compromised. The predictions should identify the areas of maximum pollution impact.
5.1.8 Noise.

The noise that can be potentially generated by the project should be assessed against existing noise levels at possible noise impact sites such as tourism sites and its effects on fauna and human health.

5.1.9 Sites of archaeological and cultural interest.

Describe impacts and indicate locations.

5.1.10 Socio-Economic

Impacts on the local community including demographic changes, economic status, human health, and increased traffic should be assessed.

5.1.11 Interested and affected parties.

Identify and list known interested and effected parties and their representatives. This may be done in consultation with the relevant authorities.

5.2 Operational phase

Describe the environmental impacts of the project on the items 5.1.1 to 5.1.11 during the phase when the mine is producing (or prospecting is underway) up to when decommissioning activities begin.

5.3 Decommissioning phase

When a mine, or part of a mine, ceases production (or prospecting activities cease) decommissioning activities start. This phase continues until closure.

5.4 Residual impacts after closure

There may be some significant residual impacts, resulting from the construction, operational or decommissioning phases, which persist after these activities have ceased and a closure certificate has been issued.

Where possible, these impacts should be identified at least qualitatively so that they can be accommodated when the closure objectives are being defined and when the environmental management program, described in Part 6, is being devised.

The environmental impact assessments done in accordance with paragraphs 5.1 to 5.3 of Part 5, will have highlighted the major issues on which to focus.

5.4.1 The potential for acid mine drainage or poor quality leachates emanating from the mine or residue deposits.

5.4.2 The long-term impacts on surface & ground water.

5.4.3 The long-term stability of rehabilitated ground and residue deposits.

5.4.4 The long-term impacts arising from river diversions.
PART 6: ENVIRONMENTAL MANAGEMENT PROGRAMME

Whenever a significant impact has been identified in Part 5, the proponent must describe how the impact will be managed. Once approved, the environmental management program set out in this Part will be legally binding on the developer.

6.1 Construction Phase

Using the checklist of items set out in 6.2.1 to 6.2.10, describe how each significant impact identified in pre-construction phase will be managed.

6.2 Operational Phase

Describe how significant impacts, identified in construction phase, will be managed during the operational phase up to when decommissioning activities begin.

6.2.1 Geology

6.2.2 Topography

Plan required of anticipated post-mining topography. Include what slopes will be achieved during rehabilitation and dump construction.

6.2.3 Soils

Include depths of soil that will be used and how soil fertility and erosion will be managed.

6.2.4 Natural vegetation/plant life.

Include a description of the plant life that will be used during rehabilitation and how the vegetation will be managed.

6.2.5 Surface water.

Indicate the strategies for managing.

• Storm water.
• The legitimate requirements of surface water users on the affected watercourse.

6.2.6 Air quality

If the assessment reveals significant potential impacts on air quality at potential impact sites include an air pollution control plan.

6.2.7 Noise

Include a noise reduction plan in significant impacts are expected at receptor sites.

6.2.8 Sensitive landscapes.
6.2.9. Visual aspects.

6.2.10. Regional socio-economic structure.

6.3 Decommissioning phase and closure

Every effort should be made during the life of the project to minimise the cost and amount of work required for this phase. This Part should briefly describe how the project will be decommissioned and closed.

Demolition or disposal of structures and buildings, removal of foundations and debris and rehabilitation of the surface.

6.3.3 Mine residue deposits.
- Disposal facilities (pipes, solution trenches, water dams etc).
- Ongoing seepage, control of rainwater.
- Long-term soil stability.
- Final rehabilitation in respect of erosion and dust control.

6.3.4 Sealing of underground workings and rehabilitation of dangerous excavations.

6.3.5 Final rehabilitation of opencast mine haul ramps and roads.

6.3.6 Submission of information.

6.4 Proposed timetable, duration and sequence

These dates are estimates and are dependant on the economic conditions pertaining from time to time during the life of the project.

6.4.1 Prospecting projects.
- Submission of prospecting EMP, where appropriate, and Prospecting application.
- Proposed start, duration and completion dates for prospecting.
- Proposed rehabilitation programme and rehabilitation completion date.

6.4.2 Mining projects
- Submission of mining EMP and applications for mining Permissions.
- Start and duration of construction period.
- Proposed start of mining, full production and cessation of production dates.
- Proposed rehabilitation programme
- Proposed dates for progressive or partial closure applications.
- Proposed decommissioning and aftercare programme.
- Proposed date for closure application.

6.5 Financial provision
Particulars should be given about the projects and proponent’s ability to make the necessary provision to implement the measures described in Part 6.

PART 7: CONSULTATION PROCESS

The applicant should provide details of the hearings and meetings with relevant authorities and individuals. At this stage the proponent is obliged to respond to issues raised during the meetings.

In reviewing the adequacy of the consultation process, together with the incorporation of its results into the detailed EIA, the Applicant should examine whether the procedure has been followed and give:

- An overview of the issues discussed
- How the concerns raised were responded to by the project proponent
- How these responses were conveyed back to those consulted

PART 8: CONCLUSION

Assuming that the closure objectives are met give the general overall net impact of the project on the environment.

PART 9: STATUTORY REQUIREMENTS

A list of permissions already granted under other statutes concerning the environment should be provided, giving permit or registration number, date and place of issue. If applications have been made but not yet granted, these should be included.

PART 10: AMENDMENTS TO EMP

This part is intended to accommodate amendments to the document so that it remains dynamic and complete.

PART 11: REFERENCES AND SUPPORTING DOCUMENTATION

References to back-up information/reports.
F. Petroleum Sector

Detailed ToR Guidelines _ Onshore Petroleum Projects

1 Executive Summary

Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources, justification, etc. In addition, it should briefly provide a compilation of the EIA report including main impact and mitigation, EMP and post-project monitoring.

2 Project Description

The following should be addressed:

3.2 Justification for selecting the proposed location.
3.3 Geographic information on the site – Latitude/Longitude, total area envisaged for setting up of project, seismic zone classification, topography, etc.
3.4 Land requirement for the project including its various project use zones and purposes, availability and optimization.
3.5 Maps at appropriate scales with proper labels and legends to illustrate the general settings of project-related development sites as well as surrounding areas likely to be environmentally affected.
3.6 Details on the implementation of the project in phases i.e., Seismic phase, exploratory drilling phase and development/exploitation.
3.7 Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs (material, water and energy balance).
3.8 Details on support infrastructure in the study area.
3.9 Details on geological, geophysical and seismic surveys.
3.10 Details on outline of the overall management structure anticipated for the proposed activities.
3.11 Details on solid waste management for drill cuttings, drilling mud and oil sludge, produced sand, radioactive materials, other hazardous materials, etc. including its disposal options during all project phases.
3.12 Details on wastewater generation, treatment and utilization/discharge for produced water, cooling waters, other wastewaters, etc. during all project phases.
3.13 Identify the legal and regulatory framework regarding the fulfillment of license requirements and other permits.
3.14 Details on the stratigraphic structure, fracture patterns and seismic history (if any) of the area.
3.15 Details on projected energy requirement for each phase of the development.
3 Description of the Environment

3.16 The baseline data to be collected from the study area w.r.t. different components of environment viz. air, noise, water, land, and biology and socio-economic (please refer Section 4.3.2 for guidance for assessment of baseline components and identify attributes of concern). Actual monitoring of baseline environmental components shall be strictly according to the parameters prescribed in the ToR after considering the proposed coverage of parameters by the proponent in draft ToR and shall commence after finalization of ToR by the competent Authority.

3.17 Details on demography and socio-economic status in the study area.

3.18 Details on establishment of baseline on the air quality of the areas immediately affected by the exploratory drilling and also particularly with reference to hydrogen sulphide and sulphur dioxide and background levels of hydrocarbons (HC) and Volatile Organic Compounds (VOCs).

3.19 Significant amount of toxic gas emissions from the site facilities and activities shall be quantified annually in accordance with nationally/internationally recognized methodologies and reporting procedures in order to reduce air emissions. Also, cost effective options that are technically feasible shall be evaluated for reducing these emissions.

3.20 Details on establishment of baseline on the water resources of the area. This baseline should include water quality assessment of available waters sources of the project site and zone of influence. The baseline should potentially include parameters such as:

- Total Nitrate
- COD
- Sulphates
- Conductivity
- Hydrocarbons
- Salinity
- BOD
- Hardness
- Heavy metals (Total metals, mercury, lead, copper etc.),
- pH
- Phosphates
- TDS
- Arsenic

3.21 Details on estimation and computation of air emissions (such as nitrogen oxides, sulphur oxides, carbon monoxide, hydrocarbons, VOCs, etc.) resulting from flaring, DG sets, combustion, etc. during all project phases.

3.22 Quantify noise and vibration levels to be expected from seismic activities and potential exploratory drilling.

3.23 Details of the basic physical environment of the study area. This should include:

3.23.1 Topography: including degree of slopes, drainage patterns around project site, and flood hazard

3.23.2 Map outlining the boundaries of area of influence in relation to protected areas, surrounding villages, roads, etc.
3.23.3 Climate, Hydrology and Meteorology: including rainfall average per year, prevailing wind patterns
3.23.4 Geology: description of the characteristics of landform, land surface including exposed rocks, types of unconsolidated materials sediments, rivers, tributaries, if they can be determined by field mapping
3.23.5 Soils: specific soil types, soil fertility, agricultural value

3.24 Land use of the proposed study area as well as the project area – notified industrial area, residential and institutional infrastructure, nearest village/township/locality, agricultural layouts, indigenous lands, mangroves, wilderness area, national parks, sanctuary, marshes, surface water bodies, roads, protected areas, agriculture, tourism. These land uses should preferably be shown using satellite imagery.

3.25 Identify patterns of land use within the corridor of the proposed route, and record these on a map with annotation.

3.26 Maps at appropriate scales and with proper labels and legends to illustrate the general settings of project-related development sites as well as surrounding areas likely to be environmentally affected.

3.27 Air Quality - Give details on baseline air quality of the areas immediately affected by the exploratory drilling.

3.28 Provide physical description of surrounding water bodies including creeks and rivers.

3.29 Studies on flora and fauna including the main habitat types with list of species of flora and fauna and their conservation value, giving particular attention to any species protected under national laws or are of conservation concern.

3.30 Details on baseline on the current presence of hydrocarbons and heavy metals in the soils.

3.31 If any incompatible land use attributes fall with in 5 km from the project boundary, proponent shall describe the sensitivity (distance, area and significance) and propose the additional points based on significance for review and acceptance by the EAC. Incompatible land use attributes include:
   3.31.1 Public water supply areas from rivers/surface water bodies, from groundwater
   3.31.2 Scenic areas/tourism areas/resorts
   3.31.3 Monuments of national significance, World Heritage Sites
   3.31.4 Airport/airfield areas
   3.31.5 Any other feature of potential land use conflict including migratory corridors etc.

3.31.6 If ecologically sensitive attributes fall with in 5 km from the project boundary, project proponent shall describe the sensitivity (distance, area and significance) and propose additional points for consideration such as in cases of Ecological sensitive attributes include: national parks, wildlife sanctuaries, Mangrove area, wetlands, forest reserves and any other protected areas).

3.32 Determine the nature and volumes of liquid waste (including sewage if applicable), and wastewater and other sources of runoff to be generated by the entire project.
3.33 Determine the nature and volumes of solid wastes, including seismic program by products, drilling mud, drill cuttings etc., to be generated by the entire project.
3.34 Quantify whether any of the solid waste are to be considered hazardous or not.
3.35 Details on hazardous or toxic chemical material or substance to be used during either seismic testing or potential exploratory drilling.
3.36 Details on existing socio-economic conditions, giving a brief overview of the socioeconomic background to the study area, including population, employment and travel patterns.
3.37 Consult with relevant local stakeholders (village councils, local community, and local NGOs) within the direct project area, to identify their economic, environmental and social concerns about the proposal.
3.38 Public Interest - Report on the views and concerns of directly affected communities, local NGOs and relevant government departments/agencies regarding the development of the project.
3.39 Archaeology - Conduct a general assessment of the area to determine any features of archaeological or cultural importance and provide recommendations for the protection of any features.

4. **Anticipated Environmental Impacts & Mitigation Measures**

4.1 Anticipated environmental impacts based on valued environmental components (VECs).
4.2 Describe and identify potential impacts on the terrestrial and aquatic fauna and flora of the study area for each phase. This would include, where applicable, forest, river corridors, wetlands, biological corridors, and protected areas.
4.3 If clearing of vegetation is required, estimate the acreage.
4.4 Details on potential impacts of seismic and exploratory drilling activities on water quality within the study area.
4.5 Details on potential impacts of project activities on the air emissions resulting out of drilling operations.
4.6 Air quality impacts should be estimated by the use of baseline air quality assessments and atmospheric dispersion models to establish potential ground level ambient air concentrations during facility design and operations planning.
4.7 Details on potential impacts on the water quality due to the activities in the various phases of the project.
4.8 Details on noise and vibration levels quantification that is expected from seismic activities and potential exploratory drilling and specify any potential impacts of these on the surrounding environment including human habitation.
4.9 Details on odour sources (such as hydrogen sulfide, mercaptans etc) and mitigation measures taken to control the odour.
4.10 Details on impact of spills and discharge of crude oil in the surrounding areas.
4.11 Details on impacts of drilling waste such as drilling mud, additives (polymers, oxygen scavengers, biocides, surfactants), lubricants, diesel oil, emulsifying agents, flocculating agents, etc. and its treatment and disposal options to control the impacts.

4.12 Details on environmental impacts of the decommissioning of oil and gas installations, drill cuttings, etc.

4.13 Describe mitigation measures including an EMP which is to be implemented to reduce or offset the adverse impacts of seismic testing, potential exploratory drilling and exportation. Also, include measures to be taken during decommissioning phase.

4.14 Details on outline designs for any proposal and costs for implementing the mitigation measures.

4.15 Identify the preferred option(s) for waste management/disposal method based on environmental grounds, including necessary infrastructure. Specify any residual impacts of waste management, their significance, and any mitigation measures to be undertaken.

4.16 Identify mitigation measures to reduce or limit the potential impact on the surrounding environment and zone of influence (humans and wildlife).

4.17 Give details on occupational health and safety impact on employees and workers.

4.18 Recommend precise mitigation measures based on the specific option selected, for the proper management of all types of traffic close to and within the project area. These mitigation measures must include recommendations for protection features against erosion, and other potential pollution to the environment as well as social and human impacts.

4.19 Describe the potential social, economic and cultural impacts of conducting the proposed activity. Characterize the impacts in terms of type (beneficial or adverse), magnitude (high, medium or low), direct/indirect, duration (short, medium and long term, sporadic), avoidance and reversibility.

4.20 Give appropriate measures that could be considered for the mitigation of impacts.

5. **Analysis of Alternative Resources and Technologies**

5.1 Evaluate options for the provision of suitable access for each of the components of the exploration phase.

5.2 Select preferred option for the provision for exploration phase components. This may need to examine construction materials (types, sources, volumes, transportation) and methods in relation to their environmental impacts.

5.3 Evaluate alternative options for meeting project needs. For these options, it may be necessary to investigate:
   - fuel storage (where relevant)
   - transportation (where relevant)
   - health and safety
5.4 Select the preferred option for energy generation. Again, this should be based on environmental grounds, and should specify the residual impacts of generation of the preferred option, their significance and the mitigation measures, which will be undertaken.

5.5 Evaluate alternative options for the collection, treatment, recycling (if appropriate), and disposal of these wastes. Identify any chemicals planned for use in the treatment or management of these wastes.

5.6 Details on improved technologies that could be used to reduce project impacts.

6. **Environmental Monitoring Program**

6.1 Details on environmental monitoring program during surveying, drilling and exploration.

6.2 Details on use of advanced monitoring technologies if any.

6.3 Identify and develop a water quality monitoring program able to detect any change in groundwater or surface water quality that could impact:

- Public health
- Forest, wetland and adjacent aquatic habitats; and
- Flora and Fauna (including endangered or threatened species) in project area and zone of influence.

6.4 Develop and Implement an air quality monitoring programme to monitor the release of toxic emission in particular SO2, CO NO2 and H2S and their potential impacts on Public Health, wildlife health and environment.

6.5 Design an appropriate monitoring network and assess the residual impacts, if any.

7. **Environmental Management Plan**

7.1 Outline the overall management structure anticipated for the proposed activities.

7.2 Details on compliance verification of the emissions of the environmental components (such as emissions limits, discharge limits, noise limits, odor, etc.) with national/ international standards.

7.3 Description of the pertinent regulations, standards and policies, governing environmental quality, health, safety and protection of sensitive areas, species and ecosystems. These could include cultural resources, protection of endangered or threatened species, infrastructure development and land use control that may have an impact on the proposed development.

7.4 Specify options for refueling of vehicles and identify best practice methods for eliminating spills and maximizing health and safety.

7.5 Details on risk assessment including identification of hazards, proposed measures, disaster management plan, contingency plan, emergency response plan, etc.
7.6 Identify emergency preparation and applicable management measures for the proposed activities dealing with the following eventualities:

- Oil spills
- Hurricanes
- Floods
- Fires
- Blow out plan
- Hydrogen sulfide safety (including other types of gases)
- Employee training and disaster preparation