

PROGRESS REPORT FOR SERENGETI NATIONAL PARK (N.156)

Name of World Heritage Property: **Serengeti National Park**

Geographical coordinates: **Long. 34° - 35°15' E, Lat. 1°15' - 3°20' S**

Date of inscription on the World Heritage List: **30.10.1981**

Organization(s) or entity (ies) responsible for the preparation of the report:

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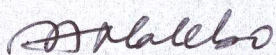
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Date of submission of the Report: **February 2019**

Signature on Behalf of the State Party:



HAMISI M. MALEBO . PhD, FASI, FRSC

**SECRETARY GENERAL OF THE UNITED REPUBLIC OF TANZANIA NATIONAL
COMMISSION FOR UNESCO**



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Serengeti National Park (United Republic of Tanzania) (N 156)

Decision: **42 COM 7B.96**,

The World Heritage Committee,

1. Having examined Document **WHC/18/42.COM/7B**,
2. Recalling Decisions **35 COM 7B.7**, **38 COM 7B.94** and **40 COM 7B.83** adopted at its **35th (UNESCO, 2011)**, **38th (Doha, 2014)** and **40th (Istanbul/UNESCO, 2016)**, respectively,
3. Commends the State Party on its anti-poaching efforts, contributing to further Reduced elephant poaching and maintaining zero poaching of rhinos in the property;

Response

Through concerted and deliberate efforts the State party has maintained zero poaching of rhinos in the property and has further reduced elephant poaching.

4. Notes with utmost concern that a series of dams have been proposed upstream of the property in Kenya, which could have a negative impact on the Outstanding Universal Value (OUV) of the Serengeti National Park and Kenya Lake System in the Great Rift Valley World Heritage properties, and requests the State Party of Kenya to submit to the World Heritage Centre, without delay, all available preliminary and full Environmental Impact Assessments (EIAs) to the World Heritage Centre for review;

Response

The State party appreciates the observation and concern of the World Heritage Centre on the potential impacts that the proposed dams will have on Outstanding Universal Value (OUV) of the Serengeti National Park. The State Party also appreciates continuous follow up of World Heritage Centre and is committed to provide all necessary support necessary to resolve this issue. Currently through relevant ministries there are plans to establish joint Water Management Plan between Tanzania and Kenya on water resources use in the Mara River Basin. The Water Allocation Plan (WAP) for Kenya has been completed through the support of the Dutch Embassy in Kenya. WAP preparation for the Tanzania side is ongoing under the support of the Sustainable Water Partnership (SWP). Once completed; the two state parties will harmonized their plans to develop one Joint Water allocation plan for the Mara River Basin. In implementation of the Joint Water Allocation Plan, the two state parties will avoid conflict of uses and mitigate detrimental effects to OUV of the Serengeti National Park and Kenya Lake System in the Great Rift Valley World Heritage properties.

5. Reiterates its request to the States Parties of Tanzania and Kenya to develop and implement a joint management plan for the Mara River basin to sustainably manage water resources, and also requests the State Party of Tanzania to inform the World Heritage Centre on the status of updating the 2006-2016 General Management Plan;

Response

Management of the Mara River Basin is stipulated on articles of the MoU between Tanzania and Kenya that was signed on September 2015. Article 2 - sets out the objectives of the MoU. Article 3 - Sets the scope of interventions, Article 4 - sets out the Governance Structure Joint Management Committee Joint Steering Committee (JSC), Joint Technical Committee (JTC) and Joint Implementation Committee (JIC) and Article 9 - gives mandate to LVBC to oversee the implementation of MoU.

It is through this MoU a 3rd Joint Technical Committee meeting of experts was held on April 5th -6th, 2018 in Kisumu, Kenya to take consideration on the concerns raised by UNESCO on the proposed Dams in the Mara River Basin. The Lake Victoria Basin Commission Secretariat made presentation on feasibility studies that were conducted by The Nile Equatorial Lakes Subsidiary Action Program (NELSAP) on the proposed dams in the Mara River Basin.

The 3rd Joint Technical Committee made the following observations:-

- i. The East Africa Community (EAC) guidelines for the Environmental Impact Assessment for shared resources in East Africa is not officially approved for implementation by parties.
- ii. The Lake Victoria Basin Commission (LVBC) to get all the necessary documentation for cooperation
 1. Protocol on Sustainable Development of the Lake Victoria Basin (2003)
 2. Lake Victoria Basin Strategic Plan (2016-2021)
 3. The Mara River Basin MoU-Tanzania & Kenya
 4. The Trans-boundary Mara River Basin Strategic Environmental Assessment and share with parties before the next JSC.

With reference to the status of updating the 2006-2016 General Management Plan; The State Party would like to inform that the management plan have been reviewed and endorsed by Tanzania National Parks (TANAPA's) Board of Trustees meeting held in June 2017

6. Appreciates that the State Party is undertaking a feasibility study and a preliminary design for two options for the Serengeti Southern Bypass route, and further requests the State Party to submit to the World Heritage Centre for review as soon as available:
 - a. The Route Option Selection Report and the feasibility study and preliminary design, including a map of the proposed alignments, upon completion by the end of September 2018,

Response

Tanzania National Roads Agency (TANROADS) through a grant from the German Bilateral Financial Cooperation, provided through the German Development Bank KfW, has tasked the Consultant in January 2017 to assist in the Route Option Selection process and subsequently undertake the Feasibility Study and Preliminary Design for the chosen option.

There are two Route Options that are the subject of the study (the "Lake Eyasi Route" and the "Mbulu Route"), one of which has already been taken up for Feasibility Study and Detailed Design (Lake Eyasi Route).

At this time, the Consultant has undertaken desk-studies and field investigations to collect socio-economic, environmental, social and technical data in support of the Route Option Selection. The draft Route Option Selection Report has been submitted and a decision for the preferred Route Option is awaited.

In general, the following activities have been completed; Material investigation, Hydrology and structure assessment and Topographic survey and amendment of Scoping Report & Terms of

Reference (ToR). Similarly, the following activities are ongoing; Geometrical design – Structural design, Earth works design, Hydrologic design and Social baseline data collection.

It is foreseen that the Route Option Selection Report and the feasibility study will be completed by mid 2019.

- b. The Strategic Environmental Assessment (SEA) and the Comprehensive Transport and Trade System Development Master Plan;

Response

The State Party note the importance of conducting SEA as required by the National Environmental Management Act of 2004 for the Comprehensive Transport and Trade System Development Master Plan prior to approval.

In February 2013, The State Party completed a Comprehensive Transport and Trade System Development Master Plan supported by the Government of Japan with technical assistance from Japan International Cooperation Agency (JICA). This Master Plan, prepared under the auspices of the Ministry of Infrastructure Development, highlights the transport and trade systems developments envisioned for the country for the period 2013-2030. With regard to transport infrastructure, the Master Plan covers roads, ports (border, inland and sea), railways, pipelines, and aviation. Rigorous Strategic Environmental Assessment (SEA) as required by the National Environmental Management Act of 2004 was undertaken and completed and approved on 10 February, 2014. Generally, there does not seem to be immediate plans (at least by year 2030) for major infrastructure development within Serengeti National Park.

7. Requests furthermore the State Party to reaffirm its commitments to maintain the northern road traversing the property as a gravel road under Tanzania National Parks (TANAPA) management and reserved mainly for tourism and administrative purposes (Decision 35 COM 7B.7) **and to abandon the construction of the proposed northern highway** (Decision 38 COM 7B.94);

Response

The stretch of the northern road traversing through the park from Tabora B to Klein's gate in the property will remain under the management of Tanzania National Park and will be maintained as a gravel road. However, the state party is intending to develop to bitumen standard parts of the northern road not traversing the property For example Loliondo to Mto wa Mbu Road; Lot 1: Wasso – Sale Junction Section (49 Km) construction has started and expected to be completed within two years.

8. Considers that the Belabela Lodge proposed within the 'low-use zone' of the property close to a wildebeest migration route could pose a potential threat to the property's OUV, and requests moreover the State Party to undertake an EIA of the proposed lodge, including a specific assessment of potential impacts on OUV in line with IUCN's World Heritage Advice Note on Environmental Assessment, and submit it to the World Heritage Centre for review;

Response

With respect to Belabela, Lodge the EIA has been undertaken and EIA certification to the developer through Ministry of Environment Vice President Office United Republic of Tanzania has been done. The state party will monitor and mitigate any potential indirect impacts to ensure that the property's OUV is not impacted. EIA report is included with this report.

9. Welcomes the proposal to include the ecologically important Speke Gulf into the property, which would require a request for boundary modification in line with the appropriate provisions in the Operational Guidelines, and encourages the State Party to ensure compensation for affected communities that were legally residing in the proposed area, and to keep the World Heritage Centre informed;

Response

The Ministry have finalized and submitted the concept and Cabinet papers for Inter-ministerial Technical Committee and Cabinet meeting for approval. Once approval has been done, comments and inputs will consolidate all views and concerns. Thereafter, the Parliament Resolution will be developed for submission to the Parliament for approval. Finally, boundary modification will be done in line with the appropriate provisions in the Operational Guidelines, and compensation for affected communities will be done accordingly.

10. Notes that based on the submitted EIA the proposed upgrade of the Mugumu airport has been significantly downsized from the initial plans to construct an international airport, also considers that it will no longer pose a significant threat to the property's OUV, but requests in addition the State Party to monitor and mitigate any potential indirect impacts should the project move forward;

Response

The proponent of the project is no longer interested with implementation of the project despite the EIA being downgraded from the initial proposed International airport. The State Party will monitor and mitigate any potential indirect impacts should the project move forward.

11. Also requests the State Party to invite a joint World Heritage Centre/IUCN Reactive Monitoring mission to the property, which should also meet with representatives of the State Party of Kenya, to assess threats posed by the dams proposed upstream of the property in Kenya, and any other developments that may impact the property's OUV;

Response

Consultation between State Parties will be done, once all necessary arrangement have been completed and Terms of Reference shared and agreed among state parties involved Reactive Monitoring Mission (RMM) will be invited. It is anticipated that consultation will be done and mission will be invited after 43 Session of the WH-Committee Meeting.

12. Finally requests the State Party to submit to the World Heritage Centre, by **1 February 2019**, a progress report and, by **1 December 2019**, an updated report on the state of conservation of the property and the implementation of the above, for

examination by the World Heritage Committee at its 44th session in 2020.

Response

The States Party has complied with this requirement through submission of the progress report as directed by WHC.

**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED
DEVELOPMENT OF SERENGETI-BELABELA LODGE TO BE LOCATED AT
MSABI HILLS WITHIN SERENGETI NATIONAL PARK, SERENGETI
DISTRICT IN MARA REGION**

DEVELOPER



M/s KAMAL ALLOYS LIMITED (AVIKA HOTELS AND RESORTS LIMITED)

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30th JANUARY, 2018

EXECUTIVE SUMMARY

M/s Kamal Alloys Limited (Avika Hotels and Resorts Limited) of P.O Box 10392, Dar-es-Salaam, Tanzania Arusha with contact telephone number +255 22 2862975 is proposing to construct and later on operate a 40-rooms Belabela Lodge to accommodate 80 visitors at full capacity at Msabi Hills in Serengeti National Park (SENAPA), Serengeti District in Mara Region. The proposed facility will provide accommodation services on full board basis to high class tourists, and other clientele visiting the world famous SENAPA. In order to ensure that the operation of the lodge is conducted in an environmentally friendly manner and pursuant to the Environmental Management Act (EMA) Chapter 191, 2004 and the Environmental Impact Assessment (EIA) and Audit Regulations, 2005, this EIA study was conducted by registered environmental experts namely Dr. Victor Apollo Runyoro, Ms. Asanterabi Lowassa-Kweka and Mr. Kasim Sengoe. Professional input on architectural-related tasks was sought from Huzeifa Yusufali from Kamal Group Companies.

The site where the proposed lodge will be constructed is situated in the “High Use Zone” and was granted to the developer by Tanzania National Parks (TANAPA) following successful accomplishment of the development requirements as provided in the TANAPA’s Development/ Actions and Lease Procedures (DALP). The grant of the site was based on the developer’s plan to partner with an international Sarovar Hotels and Resorts, which has long experience in providing high class services in hotels, lodges, resorts, apartments, water parks, and restaurants’ business. Currently Sarovar is one of the leading hotel chains with varied selection of properties, both operational and under development across India and Africa. The lodge will offer a unique “bush” environment, which will depict African culture. All buildings will be thatched with durable building material that will blend with the environment. The total investment cost of the proposed facility is estimated to be USD 10,000,000 of which, USD 6,605,000 will be spent within the country and the remaining USD 3,395,000 abroad.

The purpose of establishing the proposed lodge is to offset the existing shortage of tourist beds in SENAPA. Bed shortage has progressively expanded due to the interminable increase in tourists visiting Tanzania since the Kenya-Tanzania border was re-opened in 1984. According to SENAPA’s draft General Management Plan (GMP) of 2017, there exists 2,074 visitor beds offered in different accommodation facilities in the Park as opposed to required 3,728 (TANAPA, 2017). The existing lodges in SENAPA akin to the proposed one, in terms of quality and standard, are always overbooked during high tourist season. The market survey that was conducted by the developer prior to initiating this proposal revealed that the current market constitutes two main segments, which are high-class holiday foreign tourists and diplomats as well as business executives from within the country. The findings of the survey exemplify that the proposed lodge shall fit in well into these market segments.

Avika Hotels and Resorts Limited is a subsidiary of M/s Kamal Alloys Limited, which is a Tanzanian registered Company with registration certificate number 65167 of 21st April, 2008. The company contains an incentive certificate from the Tanzania Investment Center number 032266 of 21st August, 2017. According to the Ministry of Natural

Resources and Tourism (MNRT), the Tanzania Tourism Business License (TTBL) is issued to a company, which is ready to operate after other processes of construction have been completed.

Major stakeholders, who were consulted and gave out their opinions and views, are TANAPA, SENAPA, Serengeti District Council, MNRT and the United Nations Education, Science and Culture Organization (UNESCO)/the International Union for the Conservation of Nature (IUCN). TANAPA, which is under the MNRT, is responsible for managing SENAPA. Whereas SENAPA is on the list of UNESCO's World Heritage Sites, Serengeti District Council bears some responsibility to the proposed facility because the project will be developed in the district's administrative jurisdiction. Other stakeholders, who were consulted, are Serengeti Serena Lodge, which operates a more or less similar facility in the Park and Tanzania Wildlife Research Institute (TAWIRI).

The EIA study was conducted between March and June 2017 based on the EIA and Audit Regulations of 2005. The overall objective of conducting this EIA was to assess baseline environmental conditions of the proposed site, identify environmental and social impacts and recommend mitigation measures as well as enhancement actions for negative and positive impacts respectively. The assessment entailed literature review on relevant policies, laws, and international conventions, field visits and stakeholders' consultation. Identification of potential impacts of the proposed facility during all phases of the project was done using a simple checklist as provided in TANAPA's DALP. Significant impacts were predicted by superimposing proposed project elements onto existing social and environmental conditions. Evaluation was conducted using an impact correlation matrix. Although all possible impacts were identified, mitigation measures and enhancement actions were proposed for significant impacts rated to be high negative, very high negative, high positive and very high positive.

Results from public consultation revealed that generation of both solid and liquid waste and its subsequent management was a major environmental concern. With that regard, sorting out solid wastes into different types and keeping them into different containers at the lodge before they are transported outside the park for disposal by registered companies were recommended as basic approaches for garbage management. It was recommended that wet waste be compressed, dried and burnt together with other burnable rubbish like papers in an engineering designed chamber that control smoke from being emitted into air. Stakeholders urged the project proponent to join hands with other developers in the Serengeti ecosystem to expand and improve the existing dumping site located in the outskirts of Mugumu town to enable it receive waste in an environmentally friendly manner. With respect to sewage management, stakeholders recommended for the minimization of wastewater generation by use of water-serving appliances at the proposed lodge. A properly constructed and maintained wastewater treatment and sludge activation plant, where water recycling shall be undertaken was also recommended. The recycled water will be re-used in non-human consumption activities such as irrigating indigenous flowers and trees within the lodge premises and cleaning vehicles. While sludge shall be converted to biogas to make the wastewater treatment plant self-sufficient

in energy supply, it was recommended that neighbouring communities should be encouraged to collect the remaining dry sludge after dewatering for use as manure.

Basing on public consultation results, field observations and environmental experts' experience, positive significant impacts that were identified are employment opportunities, availability of other economic opportunities to neighboring communities, increased high-class accommodation facilities within SENAPA and opportunity for increased revenue to TANAPA, Serengeti District Council and the Treasury. Potential and significant negative impacts at different phases of the project implementation that were identified are water overutilization, generation of solid waste, increased poaching and criminal incidences, soil erosion, which may emanate from vegetation clearance and noise. Others were effect of dust to humans, wildlife and plants, interference with wildlife dispersal areas and calving grounds, potential for introduction of invasive plant species, transmission of sexual diseases particularly HIV/AIDS, contamination of soil and water by oil spills and sewage.

Alternatives, which were considered that, could achieve more or less similar objectives without deviating much from the envisaged project's goal were, the "no project", the size, design, location and technological. The EIA study revealed that the government is encouraging private investors in the hospitality industry to construct and operate high quality tourist accommodation facilities in Tanzania and particularly in the Serengeti ecosystem so as to cater for increasing number of visitors. The "no project alternative was eventually disqualified because, if opted would compromise government efforts of offsetting high-class accommodation facilities' gap in the country. A relatively bigger lodge with more visitor amenities was considered a better option than a smaller permanent tented camp because the facilities available in the park akin to the proposed one are always overbooked during high tourist season. Thus the proposed lodge in terms of size was opted in order to reduce the existing gap in tourist beds in the Park. The lodge construction concept with scattered structures was also deemed to be a relatively favoured design for its easiness to conceal buildings within the surroundings and offer calm, bushy and exclusive environment to visitors than having all activities confined in one or few structures with several storeys, which many be compromise the beauty of the natural scenery. The proposed location revealed that the lodge will be situated in the "High Use Zone" congruent to SENAPA's GMP zoning scheme where it will offer the most sought safari destination to tourists without compromising the park's conservation interests than if an alternative site would have been considered. Regular movement of visitors and park employees in this remote area of the, which is not frequently patrolled by park rangers will also control poaching.

The study revealed that all significant positive impacts will be enhanced in the course of operation and the budget for that will be set aside annually. The Company is also committed to implementing all the abatement measures addressed in the Environmental Impact Statement (EIS). Whereas some of the negative impacts have been taken care of by architectural designs and the project concept, the budget for mitigating all the identified significant impacts as shown in the Social and Environmental Mitigation Plan (ESMP), which shall be reviewed every year, is estimated to be TZS 103,000,000. Out of

the total estimated mitigation management cost, TZS 9,000,000 is for decommissioning phase. Environmental and Social Monitoring Plan (EMP) for this project, which is estimated to cost TZS 62,000,000 annually will mainly be directed to employment and availability of opportunities for income generation to local people, trend on visitor numbers to be accommodated at the lodge, trend on revenue generation by TANAPA, Serengeti District Council and the Treasury as well as status of human health and safety. Other issues to be monitored either monthly, quarterly or twice in a year are trend on liquid and solid generation and its subsequent management, water utilization, poaching and criminal incidences and level of environmental protection for both fauna and flora. Basing on environmental, financial, social and economic considerations, the proposed development was believed to be realistic and practicable over other alternatives, which were considered.

The initial lease period for the site is 25 years, which is also anticipated to be the minimum lifespan of the project but subject to renewal. At decommissioning all employees shall be paid terminal benefits as appropriately as per prevailing government policies and regulations and also encouraged to join saving and loan schemes wherever they will go. Whereas all temporary structures shall be demolished and rubble removed from the site and disposed off as appropriately as possible, permanent structures shall be retained for use by SENAPA's anti-poaching unit. Although the cost for mitigation management of decommissioning activities is currently estimated to be TZS 9000,000, it shall be reviewed according to terms and conditions dictating at the time when the project comes to an end.

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ACKNOWLEDGEMENTS

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ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immuno-Deficiency Syndrome
BOD	Biophysical Oxygen Demand
CCC	Convention on Climate Change
CBD	Convention on Biological Diversity
CD	Compact Disc
CITES	Convention on International Trade in Endangered Species
DALP	Development /Action/Lease Procedures
DP	Development Prospectus
DVD	Digital Video Disc
EA	Environmental Audit
EAC	East African Community
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMA	Environmental Management Act
EMP	Environmental and Social Monitoring Plan
EMS	Environmental Management Systems
ESMP	Environmental and Social Mitigation Plan
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GMP	General Management Plan
HAT	Hotels Association of Tanzania
HIV	Human Immuno-Virus

HP	Horse Power
ITB	International Travel Market in Berlin
IUCN	International Union for Conservation of Nature
IPPC	International Plant Protection Convention
kV	Kilo Volt
LPG	Liquefied Petroleum Gas
MNRT	Ministry of Natural Resources and Tourism
M ²	Square Meters
NEMC	National Environment Management Council
R.E	Revised Edition
SENAPA	Serengeti National Park
SWRC	Serengeti Wildlife Research Centre
TAH	Tanzania Association of Hotels
TANAPA	Tanzania National Parks
TATO	Tanzania Association of Tour Operators
TAWIRI	Tanzania Wildlife Research Institute
TTBL	Tanzania Tourism Business License
TRA	Tanzania Revenue Authority
TZS	Tanzania Shilling
UNEP	United Nations Environmental Program
UNESCO	United Nations, Education, Science and Children Organization
TV	Television
TIC	Tanzania Investment Centre

URT	United Republic of Tanzania
USD	United States of America Dollar
WMA	Wildlife Management Area
WTM	World Travel Market in London

NAMES AND SIGNATURES OF ENVIRONMENTAL EXPERTS

Dr. Victor Runyoro: Profession.....Signature.....Date.....

M/s Asanterabi Kweka-Lowassa: Profession.....Signature.....Date.....

Mr. Kassim C. Sengoe: Profession.....Signature.....Date.....

1.0 INTRODUCTION

1.1 Background Information

Tanzania has diverse natural heritages, which attract potential investors that offer a wide range of business enterprises including arable land, minerals and biological resources. One of the major country's biological resources is abundant and great concentration of wildlife. Wildlife-based tourism is one of the leading recipients of foreign investment flow in Tanzania, which contributes immensely to the country's economic growth. The tourism industry is one of the fastest growing sectors in Tanzania with 12% growth rate, which contributed an average of about 17.2% of the country's Gross Domestic Product (GDP) and 41.7% of foreign exchange earnings per annum between 2011 and 2014 (TANAPA, 2015)

TANAPA is one the government-owned organization within the Ministry of natural Resources and Tourism (MNRT), which was established by the TANAPA Act Chapter 282 Revised Edition (R.E) of 2002 to manage and regulate the use of areas designated as national parks. TANAPA is entrusted to preserve the country's heritage of natural and cultural resources as well as promoting tourism (URT, 2002a). In order to achieve the organization's mission with regard to income generation and provision of enjoyment to the public, TANAPA identifies on regular basis, depending on prevailing needs investment sites for developing accommodation facilities in various national parks, which are advertised in its investment prospectus (TANAPA, 2015). Potential investors and partners are thereafter invited to apply for available investment opportunities through print and electronic media. Investment in the national parks is guided by the National Investment Policy of Tanzania, which realizes that building a strong private sector is a pre-requisite to the country's economic growth (URT, 1996). Other TANAPA's investment guiding tools are; the National Policy for National Parks of 1994 amended in 2013 (TANAPA 1994; 2013), General Management Plans (GMPs) for respective national parks, the Development/Action/Lease Procedures (DALP) of 1995 amended in 2012 (TANAPA, 1995, 2012) and the License Agreements (TANAPA, 2015).

Through its Investment Prospectus of 2015/2016, TANAPA invited potential investors to construct and later on operate accommodation facilities of different categories in various national parks in the country (TANAPA, 2015). In response to that advertisement, M/s Kamal Alloys Limited applied for construction of a Lodge in SENAPA, Serengeti District in Mara Region and was offered a site at Belabela Hills within Msabi-Kirawira area. Initially an offer, which was granted to the prospective developer, was for the establishment of 25 guest rooms to accommodate 50 visitors at full capacity (Appendix 2). However, following a financial analysis that was conducted by the developer, it was revealed and agreed upon between the investor and TANAPA that in order to realize rational returns for the future success for both parties, permission was granted to add 15 more guest rooms and make an optimal of 40 to accommodate 80 visitors at full capacity (Appendix 3).

1.2 Project Rationale

The number of tourists visiting Tanzania has kept increasing over years since the Kenya-Tanzania border was opened in 1984 (NCAA, 2006). The existing tourist accommodation facilities particularly in SENAPA akin to the proposed one, in terms of quality and standard are always overbooked during high tourist season that is June to September and December to February. Some of those facilities are relatively costly though inadequately equipped with standard services. The draft GMP for SENAPA shows that a total of 3,728 beds are needed to cater for increasing number of visitors against 2,074, which are present. Whereas 1,074 beds are needed in the lodge category, only 764 are currently available, which means that there is a deficit of 310 beds in this type of accommodation (TANAPA, 2017). The market survey that was conducted by M/s Kamal Alloys Limited prior to initiating this proposal revealed that the current market constitutes two main segments, that is, high class holiday foreign tourists and government officials, diplomats as well as business executives who make up the local segment. The findings of the survey exemplify that the planned lodge business shall fit in well into SENAPA's GMP on one hand and the existing market segments on the other hand. The proposed Serengeti Belabela Lodge is in line with the National Tourism Policy goal, which aims at providing high-class accommodation facilities in Tanzania. M/s Kamal Alloys Limited (Avika Hotels and Resorts Limited) proposes to partner with Sarovar Hotels and Resorts, which is an international business company with long and reputable experience in the hospitality industry. The proposed collaboration is therefore in line with the National Investment Policy of 1996, which allows investment partnership between local and foreign investors (URT, 1996). The management partnership will attract more tourists from potential source markets particularly the Asian continent. It will also inspire Tanzania to improve its reputation of being a responsive supplier of high quality services, a good employer, and a good community member also expose the country as one of the destinations, which uphold the greatest value of wildlife resource.

1.3 The Company Profile

M/s Kamal Alloys Limited, which is a registered Company in Tanzania with certificate number 65167 of 21st April, 2017 (Appendix 4) manages several subsidiary companies including Avika Hotels and Resorts Limited, which will operate the proposed facility. M/s Kamal Alloys Limited possesses an incentive certificate from the Tanzania Investment Center number 032266 of 21st August, 2017 (Appendix 5). According to the MNRT, the Tanzania Tourism Business License (TTBL) to Avika Hotels and Resorts Limited will be issued once construction of the Lodge has been completed ready to start operation (Appendix 6). The head office of M/s Kamal Alloys Limited is situated at plot number 188/2, Chang'ombe Road in Dar-es-Salaam. Avika Hotels and Resorts Limited will partner with Sarovar Hotels and Resorts, which is an international company that provides high class services in hotels, lodges, resorts, apartments, water parks, and restaurants. Currently Sarovar is one of the leading hotel chains with varied selection of properties, both in operation and under development across India and Africa. The proposed Serengeti-Belabela Lodge will therefore be managed by M/s Kamal Alloys Limited (Avika Hotels and Resorts Limited) in collaboration with Sarovar Hotels and Resorts that is currently associated with a number of prestigious projects ranging from giant accommodation facilities to premier educational institutions. While the proposed

management cooperation between M/s Kamal Alloys Limited (Avika Hotels and Resorts Limited) and Sarovar Hotels and Resorts will value the knowledge of local conditions, and embrace collaborator's participation in property conceptualization as well as policy formulation, it will introduce an international flavor of hospitality and services as well as innovative and unique solutions in Tanzania. Once business has commenced, the Company shall continue to study and analyse individual differences, backgrounds and desires of the clientele to gather information that will enable improvement of the lodge services and later on, design appropriate service packages; the aim being to personalize services, where possible for the purpose of improving performance and suit the local conditions.

Sarovar Hotels and Resorts manages varied hotel portfolio, which range from premiere, portico to homotel hotels. Sarovar Premiere hotels are upscale full service 4to5-star hotel brands located in cities and leisure destinations. They are featured with fashionable architecture and interiors, international atmosphere, inventive cuisine and drinks as well as state-of-the-art business and conference facilities. Sarovar Portico hotels are full service international quality 3-star property brands. Whereas Sarovar Portico hotels are distinguished by high level of trained personnel with superior rank of functionality, they offer international standard food and beverage as well as modern and efficient facilities for meetings and functions of moderate capacity. Homotel hotels offer limited service-economy brand that fills a growing niche in the hospitality industry. They provide the budget conscious business travelers with modern facilities at relatively affordable prices.

Sarovar Hotels has a dynamic and dedicated sales and marketing team with a wide network of fully functional sales and instant reservation offices in every major city in India, promoting corporate conference and leisure segments. Marketing efforts focus on tie-ups and cross-promoting properties to the maximum advantage of all group hotels. All accommodation facilities under Sarovar Hotels and Resorts management worldwide are listed in the Group's Directory as well as the website and also represented at International travel events such as the World Travel Market (WTM) in London, England and Berlin International Travel Market (ITB) in Germany.

1.4 Objectives of the EIA Study

According to EMA of 2004, third Schedule and the EIA and Audit Regulations of 2005, first schedule, all development projects to be undertaken in wildlife protected areas should be subjected to EIA study prior to implementation (URT, 2004; 2005). The EIA process is controlled and regulated by the EIA and Audit Regulations of 2005 (URT, 2005). Further, the National Policies for National Parks in Tanzania of 1994 revised in 2013 require all development projects undertaken in national parks and adjacent areas to be subjected to EIA before they are implemented in order to avoid adverse effects on the environment (TANAPA, 1994; 2013). Through EIA process, decision makers are provided with sufficient information to make informed decisions with full understanding of the potential impacts, both negative and positive including their remedial measures and enhancement actions respectively.

The overall objective of this EIA was therefore to assess baseline environmental information of the proposed site, identify environmental and social impacts and recommend mitigation measures and enhancement actions for negative and positive impacts respectively. Formulation of impact mitigation and monitoring plans, which are part of the EIA process and important tools for evaluation, was part of the overall objective of this EIA study. The plans also provide information on the progress and results of recommended abatement measures and enhancement actions,

Specific objectives of this EIA were to:

- Identify stakeholders who may be impacted negatively or positively by the proposed project;
- Ensure adequate stakeholders participation during the life of project implementation;
- Determine and take into consideration all stakeholders' main concerns regarding the proposed project;
- Determine the project's impact boundaries;
- Recognize major project alternatives;
- Identify expected impacts;
- Recommend mitigation measures and/or enhancement actions for significant impacts;
- Prepare an Environmental Impact Statement (EIS), to be comprised of an environmental and social mitigation plan (ESMP) as well as a monitoring plan (EMP).

1.5 Scope of Work

The scope of this EIA was based on the attached Terms of Reference (ToR) (Appendix 1). The ToR gives guidance on carrying out the EIA study of constructing and later on operating the proposed Serengeti-Belabela Lodge.

The main task of this EIA study was to determine the potentiality of the project, predict impacts, evaluate their significance and recommend mitigation measures for significant negative impacts and enhancement actions for the noteworthy positive ones. Specific tasks of this EIA study entailed the:

- Description of the proposed project;
- Description of the existing physical, biological and socio-cultural environment;
- Revision of legal and administrative frameworks of the proposed project;
- Determination of the project boundaries;
- Analysis of the project's alternatives;
- Identification, analysis and assessment of potential impacts;
- Recommendation of mitigation measures and enhancement actions for significant impacts;
- Development of an ESMP;
- Development of an EMP;
- Conduction of resource evaluation or cost-benefit analysis of the project; and,
- Development of the decommissioning plan.

Issues listed below were examined:

- (a) Income to SENAPA and TANAPA;
- (b) Revenue generation to the local and central governments;
- (c) Employment creation;
- (d) Income generating prospects to surrounding people;
- (e) Destruction of ecologically sensitive areas;
- (f) Interference with wildlife dispersal areas and calving grounds;
- (g) Pollution of soil and water on site and downstream;
- (h) Threat to biodiversity within and outside SENAPA including endemic, endangered and threatened species of both flora and fauna;
- (i) Interference with geology and topography by excavation and earthmoving;
- (j) Traffic congestion along the roads to, and from the proposed facility;
- (k) Congestion of human activities at the proposed facility;
- (l) Increased runoff and soil erosion that may emanate from vegetation clearance;
- (m) Effect of illuminating light to humans, wildlife and the scenery;
- (n) Solid and liquid waste management;
- (o) Human injuries by construction equipment and vehicles,
- (p) Human attack by wildlife;
- (q) Level of water use;
- (r) Level of energy use;
- (s) Effects of noise, dust, vibration and gas emissions to humans, wild animals and plants;
- (t) Public health particularly contagious diseases ; and,
- (u) Cumulative impacts of waste generation and water utilization resulting from additional accommodation facility in the park.

1.6 Methodology

The EIA study was conducted by Dr. Victor Apollo Runyoro of P.O Box 16581 Arusha; an Ecological economist, Mrs. Asanterabi Kweka-Lowassa; a Socio-economist and Mr. Kasim Sengoe; a Natural Resource Manager all of them registered environmental experts with NEMC. Architectural work was undertaken by Huzeifa Yusufali from Kamal Group of Companies. Scoping was conducted in March 2017 to determine the extent of the study. It also intended to identify key stakeholders to be involved during detailed EIA study. Literature review and information gathering related to the site and also to the proposed project, which included the developer's concept, relevant guidelines, policies, legislation, and international conventions and agreements was done during the scoping exercise. Information gathered at this stage contributed partly to the baseline facts. Review of relevant policies, legislation as well as international conventions and agreements also helped to identify gaps and areas where further information was needed to accomplish detailed EIA study. The National Policies for Tanzania National Parks (1994; 2013), SENAPA-GMP (2006-2016), Draft SENAPA-GMP (2017), TANAPA-DALP (1995) and TANAPA-Investment Prospectus (2015/2016) were the main sources of baseline information. Specific objectives of scoping were to:

- Identify main challenges, constraints, benefits and other concerns regarding the project;
- Identify key stakeholders;

- Identify and analyze project alternatives;
- Identify the likely positive and negative impacts of the project;
- Identify required data and their source;
- Determine the project boundaries;
- Develop appropriate study methods; and,
- Develop Terms of Reference.

Scoping report was prepared according to Regulation 13(1) of the EIA and Audit Regulations of 2005 (URT, 2005), which among other things calls for conduction and description of:

- How the scoping exercise was undertaken;
- How stakeholders were identified and involved;
- Stakeholders' opinions and concerns;
- Potential negative and positive impacts;
- Boundaries of project's impacts;
- Identified project alternatives; and,
- Terms of Reference.

Stakeholders who were involved in the scoping exercise were pre-determined based on the nature of the project and institutional set up of environmental management in Tanzania as spelt out in the EMA of 2004. The scoping report and ToR were approved by NEMC on 25/04/2017 (Appendix 7). Detailed EIA study was conducted in April and May 2017 according to Regulations 15, 16 and 17 and steps provided in the Fourth Schedule of the EIA and Audit Regulations (URT, 2005), which emphasize on the following issues:

- Undertaking a survey of the existing social, economic, physical, ecological, cultural and institutional conditions within the project boundaries;
- Ensuring adequate stakeholders participation;
- Undertaking impact identification;
- Predicting and evaluating significant impacts;
- Taking into account stakeholders' concerns and opinions;
- Assessing all possible alternatives and their impacts;
- Recommending the most suitable alternative;
- Proposing impact mitigation measures for all significant negative impacts;
- Proposing enhancement actions for all positive significant impacts;
- Developing an ESMP and showing institutional responsibilities and cost estimates;
- Developing an EMP and detailing institutional responsibilities as well as parameters, to be monitored and monitoring indicators, frequency, and cost estimates;
- Developing the decommissioning plan;
- Preparing an EIS; and,
- Preparing and submitting to the Council a stand-alone non-technical summary in both Kiswahili and English languages.

Prior to meeting stakeholders, a communication procedure was developed and discussion was held with the developer in order to get knowledge on the project's dimension and other pertinent details. This was followed by a visit to the project site during scoping to assess the area's bio-physical and ecological environment. A second visit was done to collect detailed information from the site and meet with key stakeholders. Information gathered from the site and stakeholders as well as from the developer supplemented the facts that were reviewed from literature to complete the availability of baseline information or existing condition of the project.

Stakeholders who were involved during scoping exercise and those who were unfolded and consulted as detailed EIA study progressed came from the following institutions:

- Tourism Department in the Ministry of Natural Resources and Tourism;
- Wildlife Department in the Ministry of Natural Resources and Tourism;
- TANAPA;
- SENAPA;
- UNESCO Country Office;
- UNESCO Headquarters in Paris/IUCN;
- Serengeti District Council;
- Serengeti Wildlife Research Institute;
- Tanzania Wildlife Research Institute (TAWIRI); and,
- Other accommodation operators in SENAPA.

Consultation with stakeholders revolved around:

- Anticipated environmental impacts that may result from either undertaking or not implementing the proposed project;
- Appropriate measures to mitigate and manage any undesirable impacts;
- Actions to enhance desirable outcomes; and,
- The magnitude, spatial and temporal extent, likelihood of the impact, value of the affected environment, likely degree of recovery of the affected environment and level of public concern.

While other stakeholders were consulted through open-ended discussions, letters were sent to those who could not be reached and they responded in writing. Stakeholders' concerns and opinions that were raised both during scoping and detailed EIA study, are provided in Chapter 5.

After gathering opinions from stakeholders and collected information from the site, identification of potential impacts during all phases of the project implementation including pre-construction, construction, operation and decommissioning was undertaken by using a simple checklist as provided in TANAPA's DALP. Significant impacts were determined by superimposing planned activities of the proposed project onto existing social and environmental conditions. Evaluation was conducted using the impact correlation matrix. Stakeholders' concerns and opinions were complemented by experience of environmental experts to determine the magnitude and significance of impacts. A key assumption that was made in this assessment was that, the proposed

Serengeti-Belabela Lodge will be constructed and operated with due care for safety and environmental matters using best available technologies pursuant to the architectural design.

Each aspect with respect to the predicted impacts was assigned a relative value as; very high negative (-3), high negative (-2), minor negative (-1), no impact (0), minor positive (+1), high positive (+2) and very high positive impacts (+3). Mitigation measures and enhancement actions were proposed for those impacts rated with high negative, very high negative, high positive and very high positive (Table 8).

1.7 Report Structure

The report is divided into twelve chapters conforming to the requirement of EIA and Audit Regulations (URT, 2005). Chapter one consists of the introduction, Chapter two provides the project description, Chapter three reviews the policy, administrative and legal frameworks and Chapter four describes baseline or existing condition. Chapter five describes stakeholders' concerns and opinions and response by the developer. Chapter six provides the impacts that were assessed and identifies project alternatives. Chapter seven proposes impact management or environmental mitigation measures. Chapters eight and nine present impacts mitigation and monitoring plans respectively. Whereas Chapter ten evaluates resources or the cost-benefit analysis of the project, Chapter eleven presents a decommissioning plan, and Chapter twelve summarizes and concludes the report. References are followed by appendices at the end of the EIS.

2.0 PROJECT DESCRIPTION

2.1 Location

The site where the proposed Serengeti-Belabela Lodge will be constructed lies at latitude $02^{\circ} 17' 01''$ South and longitude $34^{\circ} 26' 14''$ East at an average elevation of 1340 meters above sea level at Msabi-Kirawira area to the west of SENAPA (Figure 1). The site is situated at about 420 kilometers from Arusha City and approximately 75 kilometers from Seronera airstrips (Figure 1). Three kilometers out of the 75 is an administrative/anti-poaching track off the Seronera-Ndabaka road at 72 kilometers from Seronera air strip. The relatively closer lodge is Serengeti Serena, which is situated about 45 kilometers from the proposed Serengeti-Belabela facility. Other accommodation facilities found within 20Km and beyond from the proposed site are permanent tented camps, which include Grumeti River, Serena Kirawira, Migration and Kubukubu. There are also found mobile camps to accommodate excess visitors over the permanent facilities' capacity during high tourist seasons. Relatively closer ranger posts found between 20Km and 70Km are Kirawira, Handajega and Ndabaga entrance gate (Figure 1). According to SENAPA's GMP zoning scheme, Msabi-Kirawira area is designated as "High Use Zone" where the establishment of ecologically and environmentally-friendly lodges and tented camps are allowed (TANAPA, 2006; 2017). Zoning has been singled out as one of the main management tools for SENEPA, which aims at providing framework for achieving and reconciling the twin management needs of the Park, which are to protect fauna and flora of the park as well as regulate and promote visitor use (TANAPA, 2006; 2017).

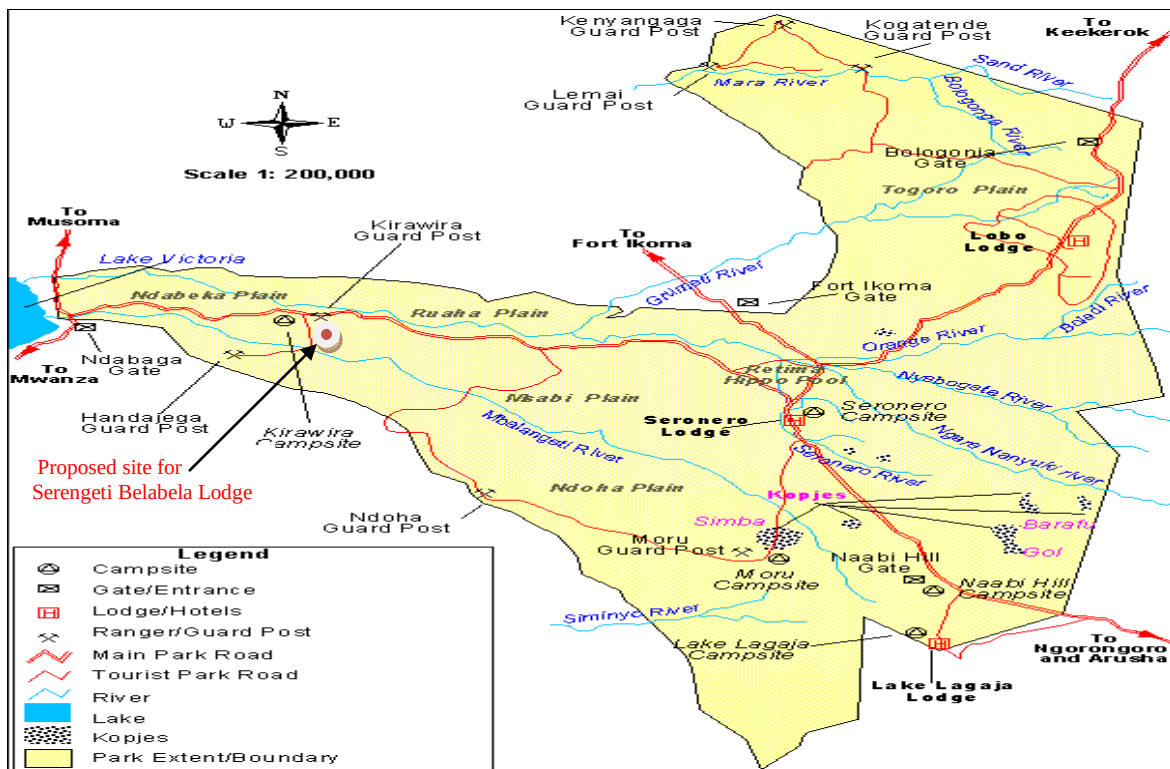


Figure 1: Location of the proposed Serengeti-Belabela Lodge site in SENAPA

Source: www.thesafaricompany.co.za, visited on 16th March, 2017

2.2 Facilities for the Proposed Lodge

The proposed Serengeti-Belabela Lodge will provide accommodation services on full board basis to high class clientele visiting the world famous SENAPA. It will offer a unique “bush” environment, which will depict African culture. According to the general site layout plan total built up area will be 12,080m² excluding infrastructure for water supply, wastewater treatment plant and guards post to be provided on the periphery of the core lodge area (Appendix 8). Wastewater shall be emptied into a water treatment plant to be located about one kilometre from the core project area on flat ground down the hill through a 0.5mm PVC pipe buried one meter under the ground. Recycled water will be supplied for re-use in non-human consumption utilization through a black synthetic pipeline that will be buried half a metre under the ground. Space between one structure and the other will range from 35 to 40 metres. Although the final land area to be allocated by TANAPA for the proposed development will be determined by the general site layout plan of the lodge, topography, physical features and evening activities such as guided short walks within the lodge vicinity, a total of 156,000m² will be requested. While 10% will be built up area, 90% will be taken up by pathways, open space, utility infrastructure, wastewater treatment and outdoor activities.

The main building will comprise a reception, administrative offices, the lounge, gift shop, business centre, restaurant, bar, kitchen, cold rooms, stores, open area restaurant and public toilets. In the vicinity of the main building there will be a wellness block, amphitheatre, a yoga place and an additional bar. All these structures will cover a total area of 2,750m². The walls on the front side of the main building will be elevated about half a metre above the ground to be supported by treated poles in concrete footings, painted with environmentally blending colour (Figure 2).



Figure 2 Conceptual drawing of the main building of the proposed Serengeti- Belabela Lodge.
Source: M/s Kamal Alloys, architectural drawings (2017)

Forty (40) guest rooms with one bar to cover 300m² will be located within guest accommodation premises will cover a total of 5,560m² varying in size from 75m² for each of the 20-studio type of rooms (total=1,500m²), 10-executive suites each to cover 120m² (total=1,200m²), 8-Belabela suite each to take up 240m² piece of land (total=1,920m²) and two presidential suites with 75m² each (total=225m²). Each of the eight Belabela and two presidential suites will contain its own small swimming pool adjoined to the room. The rooms will be self-contained erected about half a meter above the ground on wooden plinths pinched on stone mounds (Figure 3). Raising guest rooms above the ground will allow free movement of small creatures and prevent poisonous organisms like snakes from entering into rooms.

The walls of the guest rooms will be constructed with cement blocks and the roof will be screed with cement on top of shingles then covered with thatch grass. Each of the 40 rooms will be furnished with one 6m-wide wooden bed, one 3m-wide bed, two side tables, a coffee table and safari chairs. At the back of each room there will be a shower to supply hot water from a solar-powered heater, a washing basin and a flush toilet. Additional two safari chairs and a coffee table will be provided at the terrace of each room. Inside guest rooms and terraces, floor will be finished with screed cement. Whereas building materials for the guest rooms will blend with the environment, they will as much of possible be concealed by the thick vegetation to allow privacy (Figure 3). One studio-type of rooms and one executive suite will be fully furnished and equipped to accommodate disabled persons.



Figure 3 Conceptual outlook and arrangement of guest rooms for the proposed Serengeti-Belabela Lodge.

Source: M/s Kamal Alloys, architectural drawings (2017).

Recreation facilities will include an area for outdoor party and a conference hall that will be located few metres from an entrance gate where incoming and outgoing vehicles will park. An outdoor party area will cover 350m² and a conference hall 700m² piece of land. There will two swimming pools; 900mm and 1,600mm deep at the shallow and deep ends respectively each to occupy 130m² piece of land (total=260m²). One pool will be used by occupants in executive suites and the other one those occupying the studio-type of rooms. The walls and floor of the swimming pools will be finished with ceramic and porcelain tiles respectively each to consist, a pump house of the size 2.5x2.5x5m and a balancing tank of 1.5x2.5x1.5m capacity. The pools will be located strategically to allow easy access by all visitors from the two types of accommodation facilities.

Proper sanitation of swimming pools will be ensured to maintain the visual clarity of water and prevent transmission of infectious waterborne diseases. Application of disinfectants to kill infectious microorganism particularly chlorine, which is relatively economical with ability to destroy and deactivate a wide range of potentially dangerous bacteria and viruses will be applied. However, infected swimmers as well as body oil, sweat, cosmetics, urine, saliva and faecal matter may react with chlorine to produce trichloramine and cyanogen chloride chemicals, which are dangerous to human health. To contain that risk, shower rooms shall be availed to enable swimmers take bath before and after swimming so as to minimize the introduction of contaminants into the pool. Higher pH drastically minimizes the sanitizing power of chlorine as it decreases oxidation-reduction potential and lower pH causes discomfort to swimmers especially to the eyes (www.wikipedia.org/wiki/swimming-pool-sanitation, retrieved on 5 January, 2018). Thus, regular testing of pH level will be undertaken to maintain proper levels in the pool.

Other potential sources of pool contaminants are windblown dirt and debris, incoming water from unsanitary sources, rain containing microscopic algae spores and bird droppings. To control this risk, an electrically operated water pump to re-circulate water by a reverse osmosis system and allow air circulation to limit the building up of harmful compounding will be installed. Water filter to remove pollutants will also be fixed. However, since the swimming pools will be treated with chlorine, ant-stain and flocculants, water from the pools will be emptied into the recycling and sludge activation system and fresh water refilled when pH and chlorine have reached allowable limits.

A trained lifeguard who will be physically fit, carrying a whistle and wearing distinctive clothes so that he/she can be easily seen will always be around when guests are using the swimming pools. A lifeguard will be the one with ability to swim on his/her front and back for 100 meters without stopping. Awareness to swimmers on hazards and risks at the facility will be made through display notices at the reception, in changing rooms and on pool sides. While floors, stairs, internal walls and the whole premises at the pool shall always be kept clean, dustbins for waste disposal shall be provided and emptied every night.

Staff quarters to accommodate up to 80 employees and a drivers' block to be occupy at most 20 drivers will cover 700m² and 600m² respectively. There will be 40 rooms, each designed to accommodate maximum of two staffs and one 10-room block each to be

occupied by two drivers. Staff houses will be provided with washing basins, 10 showers and 10 flush-type of toilets arranged in a way that provides privacy. Staff houses will also be furnished with beds, lockable cupboards, tables, chairs, bedside table and electric lights. Adjoining the staff block there will be a canteen to be provided with indoor recreational facilities including a Television (TV) set, kitchen, storage room and a laundry. A kitchen will be equipped with a fridge/freezer, stove and oven, cupboard with all necessary cooking equipment and a store for keeping crockery and cutlery. Walls of the staff and drivers' houses will be constructed of treated timber on concrete foundations, roofed with corrugated iron sheets and topped with thatch grass to blend with the environment. A workshop for light vehicle maintenance and other mechanical and electrical activities will cover 450m². A house for a sound-proof backup generator and other service works will cover 300m². A dispensary to attend on emergency for the visitors, guest drivers and lodge staff will occupy 300m² of land. A squash court provided with changing rooms to be located near the overnight parking area within the staff premises will cover 520m².

2.3 Project Investment Cost

Total investment of the proposed Serengeti-Belabela Lodge will be USD 10,000,000. Out of the total investment approximately USD 790,000 will be spent during pre-construction phase with major expenditure items being preparation of architectural drawings, quantity surveying, professional studies as well as installation of water supply infrastructure and construction of an access road. USD 4,920,000 will be spent on purchasing building materials, transportation, contractor, labor and supervision. The remaining USD 4,290,000 will be expended on purchase of furniture, utensils and other equipment (Table 1).

Table1 Estimated investment cost in USD

Expenditure Items	In the Country	Abroad	Total
Studies and Missions			
Pre-cost	40,000	25,000	65,000
Missions	45,000		45,000
Architectural drawings		275,000	275,000
Professional studies	85,000		85,000
Quantity surveying	100,000		100,000
Water supply infrastructure	135,000		135,000
Access road	85,000		85,000
Sub total	490,000	300,000	790,000
Construction			
Building materials	1,650,000	820,000	2,470,000
Transportation		500,000	500,000
Labour	750,000		750,000
Contractor	1,000,000		1,000,000
Supervision and travelling	100,000	100,000	200,000
Sub-total	3,500,000	1,420,000	4,920,000
Furniture, utensils and other equipment			
Guest rooms	1,050,000	410,000	1,460,000
Main building	320,000	165,000	485,000
Staff quarters	490,000	680,000	1,170,000
Others including a backup generator and solar gadgets	655,000	520,000	1,175,000
Sub-total	2,515,000	1,775,000	4,290,000
Grand Total	6,605,000	3,395,000	10,000,000

Source: M/s Kamal Alloys development prospectus (2017)

2.4 Development Phases

The development of the proposed Serengeti-Belabela lodge will consist various phases starting with pre-construction to construction and from operation to decommissioning. Each phase will have/had its own specific activities and associated cost as described below.

2.4.1 Pre-construction

(a) Missions, preparation of architectural drawings and other professional studies

The whole of 2016 was spent on undertaking various missions including the preparation of the project development prospectus to fulfill TANAPA's initial requirements. Preparation of bill of quantities and architectural drawings were also done in 2016. Hydro-geological survey was carried out in 2016 This EIA study was commissioned in February 2017.

(b) Water supply

A deep borehole to supply the lodge with reliable as well as clean and safe water on sustainable basis will be drilled before actual construction has started. A hydro-geological survey that was conducted between 6th and 8th March 2016 indicated that surface and underground water quality was good (Appendix 9). Recommended dimensions of a borehole are 150m deep, 20cm diameter and 15cm for the well assembly at the top. However, the report underlines that the final drilling depth may change depending on the

rock strata to be penetrated as well as the quality and quantity of water to be struck during drilling operation (Appendix 9). Distance to where a borehole shall be drilled will be approximately one kilometer from the core project area and therefore the length of the black synthetic pipeline system to be buried 0.5 meters under the ground and supply water across all corners of the project is estimated to be two kilometres. Water will be pumped by a submersible pump installed in the borehole to two overhead polythene tanks each with the capacity to store 10,000 litres placed on 6-inches diameter galvanized steel pipe platforms and camouflaged within the surrounding woodlands. Drilling a borehole prior to erecting permanent structures will ensure availability of water early during construction. Plan related to borehole construction was included in the project development prospectus, which was submitted to TANAPA for evaluation and approval. A detailed hydrological study including analysis of the chemical, physical and microbiological quality of underground water shall be commissioned after TANAPA has approved the development prospectus but before final drilling is undertaken. Apart from ensuring that there will be no disruption with flowing patterns and water regimes, the analysis will confirm the quality limits of drinking water provided in the Environmental Management (Water Quality Standards) Regulations, 2007 (URT, 2007a). Once water quality and quantity have been determined, the developer shall apply for a drilling and water use permit from Victoria Water Basin Office.

Water supply from a borehole will be considered successfully completed when:

- A concrete slab has been built around the top of the well assembly for sanitary protection. The topmost five meters grouted with cement to avoid pollution of the water in the borehole.
- A borehole has been compressed with air until the water becomes absolutely silt free.
- Shallow groundwater has been protected by sealing at least 20 meters from the ground level with non-screen casing;
- A pump test has been conducted for at least 8 hours;
- A 2-inches groundwater level pipe to facilitate monitoring water quality has been installed;
- Water quality analysis profile has been conducted; and;
- Drilling camp has been demolished, all waste removed from the site and landscaping conducted.

(c) Erection of a temporary camp for construction crew

A total of 40 construction persons will be employed; 10 of them will be skilled and the remaining 30 will be labourers including two cooks. Majority of the casual labourers will be recruited from Robanda and Lamadi hamlets in Serengeti and Bunda districts respectively, which are located outside the park but relatively closer to the proposed site. Consultation with village leaders where prospecting construction workers will come from shall be done prior to recruitment. Since the construction personnel will be required to reside at the site during construction, a temporary camp will be erected. The camp will be erected where staff/drivers' buildings will later on, be constructed. The construction camp will be comprised of three medium-size tents to accommodate non-skilled people and ten small ones, each to accommodate one skilled personnel. There will be four pit latrines and four showers, a store to cover about 60m² to keep building materials and a 40m² open

place covered with canvas where cooking and eating shall take place. There will also be a contractor's office of about 15m² with space for conducting site meetings. Walls of a store and office will be constructed of timber and thatched with grass on top of corrugated iron sheets so as to blend with the environment. Source of power at the construction site will be solar and water will be supplied from a water bowser.

(d) Roads and accessibility

A track to access the proposed site, which is about three kilometres off the Seronera-Ndabaka road, will be constructed before commencing the construction of lodge structures. The width and standard of a track will conform to exiting standards as provided in the Park's GMP and construction will be supervised by SENAPA Engineering Department. The estimated maximum traffic volume per day along the access track, which will also be used to fell visitors during operation of the lodge, will be 10-seven ton construction trucks and 20 small vehicles during high tourist season. Vehicle going to the construction camp and to the lodge during operation will be restricted to designated tracks.

2.4.2 Construction

Construction of the proposed lodge will commence immediately after all necessary permits have been granted and foreseen to be completed within twenty four months. Tasks to be undertaken during construction phase will be:

- Construction of all lodge structures;
- Transportation of building materials;
- Food supply to the construction team;
- Installation of drainage, plumbing and electrical requisites;
- Finishes and decorations;
- Removal all waste from the site;
- Landscaping; and,
- Commissioning the facility.

(a)Construction activities

Type and sources of construction materials for the proposed Belabela Lodge are summarized in Table 2.

Table 2:Type and sources of building materials for the proposed Serengeti- Belabela Lodge.

S/N	Type	Source	Justification of the source
1	Stones and aggregates	Robanda Village	Available at respective village, which is relatively closer to the facility and to ensure that communities benefit from the presence of the facility in their vicinity
2.	Sand	Lamadi Village	Available at respective village, which is relatively closer to the facility and to ensure that communities benefit from the presence of the facility in their vicinity
3.	Cement	Arusha city	Available in bulky and average price per unit always go down when bulk procurement is made.
4.	Round and flat steel bars	Dar-es-Salaam city	Cost price will be offered by mother Company; M/s Kamal Alloys Limited
5.	Treated round wood	Arusha city	Available at relatively cheaper price than from closer areas and transportation cost reduced when transported with other materials
6.	Sawn soft timber	Arusha city	Available at relatively cheaper price than from closer areas and transportation cost reduced when transported with other materials
7.	Door/window frames and shuttles	Arusha city	Readily available at relatively cheaper price than other closer areas and transportation cost reduced when transported with materials
8.	Corrugated iron sheets	Arusha city	Available in bulky and average price per unit always go down when bulk procurement is made
9.	Thatch grass	Mto wa Mbu in Monduli District,	Type required, which is also durable is available in that area
10.	Electrical devices	Arusha city	Available at relatively cheaper price than other closer areas and transportation cost reduced when transported with materials
11.	Plumbing devices	Arusha city	Available at relatively cheaper price than other closer areas and transportation cost reduced when transported with materials
12.	Furniture	Arusha and Dar-es-Salaam cities	Various designs will be needed to suit and conform to other international facilities operated by the proposed partner
13	Utensils	Arusha and Dar-es-Salaam cities	Different types will be needed to suit and conform to other international facilities operated by the proposed partner
14.	Others	Local and abroad	Not identified in 1-13 above.

Source: Site visit, stakeholders' consultation and developer's development prospectus (2017)

Tables 3, 4, 5 and 6 summarize estimated quantity and cost of building materials for the main building, guest chalets, staff/drivers' quarters and two swimming pools respectively. A total of USD 2,455,000 is budgeted for construction activities. USD 15,000, which will be spent on the erection of a temporary camp (2.4.1(c) and cost for transportation of materials, labour and payment of the contractor is not included in this estimate (Table 1).

Table 3 Estimated quantity and cost for the lodge's main building, conference hall, wellness block, amphitheatre, dispensary, and a yoga place.

S/N	Type of material	Estimated quantity	Cost per unit price (USD)	Total cost (USD)
1.	Sand	360 lorries @ 7 tons	31.0	11,160
2.	Stones	175 lorries @ 7 tons	62.0	10,850
3.	Aggregates	165 lorries @ 7 tons	62.0	10,230
4.	Cement	20,000 bags @ 50 Kg	7.0	140,000
5.	Treated cum poles	13,600 RMs	7.0	95,200
6.	Hardwood sawn timber	6,717 RMs	20.0	134,350
7.	Softwood sawn timber	15,200 RMs	7.0	106,400
8.	Steel bars	54,000Kg	2.0	108,000
9.	Gypsum board	3,800m ²	9.0	34,200
10.	Porcelain floor tiles *	3,800m ²	20.0	76,000
11.	Ceramic wall tiles	185m ²	135.0	24,975
11.	Electrical devices	Assorted	Various	44,600
12.	Plumbing devices*	Assorted	Various	33,067
13.	Paint and white ash	Assorted	Various	44,692
14.	Casement windows	115 pieces	270.0	31,050
15.	Thick glass for windows	2,470m ²	7.0	17,290
16.	Door frames	90 pieces	220.0	19,800
17.	Door shuttles	90 pieces	356.0	32,040
18.	Fittings and fixtures	Assorted	Various	85,556
19.	Others	Various	Various	75,820
TOTAL		--	--	1,135,180

Source: M/s Kamal Alloys Limited Bill of Quantities (2017)

Table 4 Estimated quantity and cost for forty guest chalets

S/N	Type of material	Estimated quantity	Cost per unit price (USD)	Total cost (USD)
1.	Sand	400lorries @ 7 ton	31.0	12,400
2.	Stones	210 lorries @ 7 ton	62.0	13,020
3.	Aggregates	195 lorries @ 7 ton	62.0	12,090
4.	Cement	12,000 bags @ 50Kg	7.0	84,000
5.	Treated cum poles	6,630 RMs	7.0	41,410
6.	Hardwood sawn timber	5,900 RMs	20.0	118,000
7.	Softwood sawn timber	9,360 RMs	7.0	65,520
8.	Steel bars	13,470Kg	2.0	26,940
9.	Gypsum board	5,560 m ²	9.0	50,040
10.	Porcelain floor tiles	5,560 m ²	20.0	111,200
11.	Ceramic wall tiles	200 m ²	135.0	27,000
12.	Electrical devices	Assorted	Various	27,410
13.	Plumbing devices	Assorted	Various	22,230
14.	Paint and white ash	Assorted	Various	20,000
15.	Casement windows	64 pieces	270.0	17,280
16.	Thick glass for windows	2,350 m ²	7.0	16,450
17.	Door frames	80 pieces	220.0	17,600
18.	Door shuttles	40 pieces	350.0	28,000
19.	Fittings and fixtures	Assorted	Various	31,575
20.	Others	Various	Various	15,255
TOTAL		--	--	759,300

Source: M/s Kamal Alloys Limited Bill of Quantities (2017)

Table 5 Estimated quantity and cost for staff, drivers, workshop and generator room.

S/N	Type of material	Estimated quantity	Cost per unit price (USD)	Total cost (USD)
1.	Sand	166 lorries @ 7 ton	31.0	5,160
2.	Stones	55 lorries @ 7 ton	62.0	3,440
3.	Aggregates	36 lorries @ 7 ton	62.0	2,240
4.	Cement	4,540 bags @ 50Kg	7.0	31,765
5.	Hardwood sawn timber	730 RMs	20.0	14,610
6.	Softwood sawn timber	6,110 RMs	7.0	42,770
7.	Steel bars	9,800Kg	2.0	19,600
8.	Ceiling board	3,800m ²	6.0	22,800
9.	Electrical devices	Assorted	Various	10,620
10.	Plumbing devices	Assorted	Various	7,025
11.	Paint and white ash	Assorted	Various	13,890
12.	Door shuttles	100 pieces	350.0	35,000
13.	Door frames	100 pieces	220.0	22,000
14.	Window frames	100 pieces	70.0	6,670
15.	Window shuttles	100 pieces	110.0	11,000
16.	Corrugated iron sheets	500 pieces	65.0	32,500
17.	Others	Various	Various	12,870
TOTAL		--	--	293,015

Source: M/s Kamal Alloys Limited Bill of Quantities (2017)

Note: Floor will be finished with cement screed

Table 6 Estimated quantity and cost for two swimming pools toilets and a changing room.

S/N	Type of material	Estimated quantity	Cost per unit price (USD)	Total cost (USD)
1.	Sand	7-ton lorry	31.0	5,030
2.	Aggregates	7-ton lorry	62.0	7,405
3.	Cement	50kg bags	7.0	44,290
4.	Hardwood sawn timber	R.Ms	20.0	4,575
5.	Softwood sawn timber	R.Ms	7.0	7,100
6.	Steel bars	Kg	2.0	11,800
7.	Nails and binding wire	Various	Various	1,960
8.	Porcelain floor tiles	400m ²	20.0	8,000
9.	Ceramic wall tiles	250m ²	135.0	33,750
10.	Ceiling board	M ²	6.0	9,560
11.	Electrical devices	Assorted	Various	8,800
12.	Pumps, pipes, filters etc.	Assorted	Various	62,770
13.	Paint and white ash	Assorted	Various	31,340
14.	Casement windows	Units	270.0	6,220
15.	Thick glass for windows	M ²	7.0	5,330
16.	Door frames	Units	70.0	2,220
17.	Door shuttles	Units	110.0	3,560
18.	Fittings and fixtures	Assorted	Various	1,275
19.	Others	Various	Various	13,070
TOTAL		--	--	267,505

Source: M/s Kamal Alloys Limited Bill of Quantities (2017)

Note: R.M stands for Running meters

Sawn hardwood will mostly be used for fascia boards and fixtures such as wardrobes and cupboards.

Sawn softwood will mostly be used for brandering, rafters, struts and wall plates.

Cement will be used in construction works and making blocks at the site

(b) Transportation of building materials

Delivery of all construction materials to the site will be by trucks of not more than 10 tons capacity so as to limit soil trampling. Frequency of vehicle movements to, and from the site will be controlled during construction. Detailed list and particulars of all construction equipment, machinery and vehicles shall be submitted to TANAPA for approval before commencing the construction works.

(c) Food supply to the construction crew

As long as all the people to be involved in the construction activities will stay at the site, they will be provided with all meals. The team will be required to take care of food remains from scavengers and the contractor will be responsible for appropriate disposal of the same.

(d) Waste management

During construction approximately 120kg of solid waste will be generated. Foodstuffs will be purchased within the limits of the crew requirements so as to minimize rubbish generation of wet waste. Plastic bottles as well as remains from building materials such as wood and nails plus empty containers like cement bags, plastic papers and paint cans will be major source of waste. The contractor shall ensure that all rubbish is collected, sorted according to type and disposed in drums covered strong lid at the site before a contracted waste transporter is hired to haul the same to Arusha city and sell it for recycling. At the end of construction phase all rubbish, scaffolding and unused materials shall be removed from the site.

An estimated average of 4,000 liters of water will be used per day during construction phase. About 2,000 will be used in construction activities and the remaining 2,000 by the workers mainly for bathing and washing. Each of the 40 workers at the camp is estimated to use 40 liters per day giving a total of 1600 and the remaining 400 liters will be used in equipment washing, cooking and sprinkling on ground to contain dust as most of the construction works will be done in dry season. The 1,600 liters to be used for bathing and washing will eventually turn into wastewater. Bathrooms will be attached to pit latrines and therefore wastewater will be drained into those pits through a pathway constructed with screed cement. Disease vectors especially flies from pit latrines as well as germs and bacteria from garbage collection centers will be controlled by spraying chemicals preferably Elex Ottokil disinfectant, which also inhibits offensive odor. The contents of this disinfectant are water, perfume, surfactants, preservatives, color and hydrochloride. Normally 20mls of Ottokil is diluted with ten liters of water before use. Pit latrines shall be covered once construction activities have been completed.

(e) Landscaping

At the end of construction phase landscaping shall be conducted to restore the scenery as possible to its original state. Despite that cutting down of trees at the site will be minimized in order to obscure the lodge from visual impact and increase privacy to visitors, indigenous trees to the area particularly acacia species shall be planted after construction and landscaping. Walkways to connect all structures will be stabilized with steep angle including casting concrete and laying stones to avoid skidding. All lights along walkways will be down-casted to reduce direct illumination.

(f) Safety and health

Prior to starting construction, a list of names and photographs of the construction people shall be submitted to SENAPA. Any worker expelled or who will terminate employment on own reason(s) shall immediately be reported to SENAPA. Movement beyond the proposed site by the construction workers and visitation by unauthorized guests shall be prohibited. TANAPA will be requested to station a full time armed ranger at the construction site to protect workers from wildlife attacks and also enforce Park rules. Construction activities shall take place throughout the week between 07.30 hours and 17.30 hours except Sundays and public holidays. Efficient protection from injury, which may result from construction works, shall be ensured. Construction workers shall be

provided and required to use protective gear including but not limited to pair of overall, pair of boots, helmets, pair of hand gloves, earmuffs and eye shields. Signboards shall be placed and maintained on the site to remind workers to use the gear. The Company shall keep a fully-equipped first aid kit at the construction site and a vehicle shall be stationed full time to transport injured worker(s) to nearby hospital during times of complicated cases. Enough hand-held fire extinguishers shall be kept at the site to contain any fires. Sanitation of the construction site shall be arranged and maintained to the satisfaction of the labor and health authorities and inspected quarterly in a year for compliance, by the Labor and Health Officer from Mugumu District Council.

2.4.3 Operation

Operation of the proposed Serengeti-Belabela Lodge is expected to continue for an initial period of 25 years; minimum time the developer is expected to be leased the site by TANAPA. However, lease agreement may be renewed several times depending on dictating conditions. Operation of the facility will therefore entail the following activities:

- Marketing
- Transporting tourists in and outside the facility by tour operators;
- Provision of accommodation, meals and laundry services;
- Game viewing;
- Bird watching;
- Photographic safaris;
- Sunset walks within the Lodge compound;
- Traditional dances;
- Library with education materials on nature and culture;
- Swimming, yoga, gym, spa and nature treatment;
- Minor maintenance of vehicles;
- Light car washing;
- Welfare, occupational health and safety management.
- Solid waste management; and,
- Liquid waste management.

(a) Marketing

The proposed lodge is designed to meet the purpose of serving high class visitors, by providing high quality services commensurate with the requirements of international guests, who would like to spend their time in SENAPA. This means that marketing of services to be provided by the developer will be a vital component during operation phase. Marketing techniques will combine common tools such as advertising on websites of the Company, subsidiary and collaborators; distribution of brochures as well as travel magazine and adverts in the print and electronic media including Compact Discs (CDs) and Digital Video Discs (DVDs). Electronic marketing is expected to be very useful in individualizing and customizing the proposed lodge services and in identifying customers who will be more valuable and potential of being more worth to the business and therefore plan marketing offers, which will fit in their needs. The Company will also participate in International Trade Fairs in Europe, north and southern America, Asia, and other African countries such as South Africa and Kenya. Intensive use of sales agents,

marketing executives and collaborating tour operators, shall form the core strategy to increase and maintain the Company's market share.

(b) Visitor transportation and services at the lodge

Many visitors to the lodge will be on package program and therefore will travel using the Company's vehicles and other tour companies known to offer high quality transportation services. Before arriving or after they have left the proposed Belabela Lodge, and depending on their itinerary, visitors will be accommodated in different facilities in the northern tourist circuit offering more or similar services akin to the proposed facility. A workshop for light maintenance of visitor and Company vehicles will be provided. Vehicle washing will be done with staff compound using recycled water. At the proposed Serengeti-Belabela Lodge, accommodation will be on full board basis including breakfast, lunch/packed lunch and dinner. Whereas the source of supplies will mainly be Arusha city, foodstuffs in particular meat and eggs will be purchased from local communities if available and produced sustainably but meeting international quality and quantity standards. The local community will be encouraged and supported to produce goods of requisite quality and standards so that the proposed facility can be their reliable market in the long run.

Activities to be conducted while at the lodge will be distinctive including game viewing bird watching from vehicles and photographic safaris, short distance walks limited to the lodge boundaries, as well as night drivers on request and approval by SENAPA. Other services to be provided at the lodge will be, internet, library, conferences as well as educational and awareness lectures on nature and culture. Whereas local groups will be invited from Robanda village to perform traditional dances and share their cultural experience with visitors at the lodge, options for gym, spa, yoga, squash, and nature treatment will also be available. A curio shop shall be provided at the lodge for the local people to sell their locally produced artifacts and some members of the community will also serve as interpreters when visitors will visit villages outside the park.

(c) Source of energy

Whereas the main source of energy for lighting and water heating will be sunshine tapped by solar panels and stored in batteries, liquefied petroleum gas (LPG) will be the major energy source for cooking. The power system will be installed in such a way that utility circuits are isolated to enable guests receive power via inverted power from the battery bank during the night. An average of 10 kilograms of LPG per day will be required at the lodge's full capacity, which will be supplied by Manji's Gas Company from Arusha. A combination of solar power and LPG will suffice to run twin energy gas-electrical fridges and freezers. Rechargeable lamps and torches will also be available to visitors and workers for mobile lighting during the night when moving from one point to the other within the facility's premises.

An average of 100 liters of diesel will be required per day to run a backup generator, water pumping machine and logistic vehicles at full occupancy. Maximum of 200 kilo volt (kV) per day will be needed to operate a water pumping machine that will pump water to the raised storage tanks to be hidden between thick vegetation cover and supply

the lodge with water by gravity. A 25-horse power (HP) submersible pump will require at least 122.5kVs (25 HP x 0.7 kV per hour x 7 pumping hours) per day. Source of emergency power for charging an inverter for lighting and running fridges and freezers should the weather become cloudy for longer period of time will be a 150kV Poweric Cummuunis generator-make. Although this type of a generator conforms to the Indian Environment (Protection) Rules of 1996, in the sense that it is noise and pollutant emission-free machine, it will be housed in a sound-proof room together with the battery inverter system. Walls of the sound-proof room will be thick to contain pollution problems associated with noise, smoke, vibration and oil spills. Notwithstanding that the generator will be in sound proof room, emission levels for significant greenhouse gases particularly *Carbon dioxide*, *Carbon monoxide*, *Nitrogen oxide* and *Sulfur dioxide* shall be monitored monthly to ensure they remain in allowable limits in compliance to the Environmental Management (Air Quality Standards) Regulations, 2007. Should the generator get older and emissions exceed allowable limits it shall be replaced.

(d) Welfare and safety and health of employees and visitors

Staff establishment for the proposed Serengeti-Belabela Lodge will be 80 employees. Local people from Serengeti and Bunda districts will be given priority during employment should they have requisite qualifications. Recruitment will always be done in consultation with Managements of SENAPA and respective Village Authorities. Consultation is very important because the authorities are aware of potential capacities for villages to provide workers and have records past poachers and criminal individuals. Of all the total employees, 50 per cent will be employed on permanent and pensionable terms and the remaining 50 per cent on contract basis. Those employed under contract shall be laid off during low/off tourist season to cut down operational cost and this arrangement will be agreed upon, and a contract signed between an employee and the employer. Staff at the proposed lodge shall be provided with full boarding; including meals.

Transport from, and to their place of origin during recruitment and annual leave shall be provided. Uniforms, safety and health protective gear, medical care and first aid equipment shall also be provided to workers. All areas with potential for fire ignition including guest rooms, kitchen, workshop, generator room, swimming pools and staff/drivers' quarters will be provided with fire extinguishers. In all guest rooms there will a torch fixed with a whistles to alert guards in case of emergency. Protection of workers against wild animals shall be emphasized by providing awareness education on the need to comply with park rules. While a dispensary to deal with normal diseases and injuries will be available at the lodge, at least one vehicle shall be stationed full time to transport both the staffs and visitors outside the lodge for complicated cases.

Employees shall work 48 hours a week; which is 8 hours a day for six days as provided in the Employment and Labour Relations Act No. 6 of 2004 (URT, 2004a). To comply with this Act regarding working hours, shifts shall be arranged in such a way that, hours spent working for each employee shall not exceed those provided in the Act. In case any employee will be engaged on work for more than the specified working hours, overtime allowance shall be paid according to prevailing labor laws.

Drums containing petrol and diesel shall be stored in water-proof concrete-floored rooms. The rooms will prevent spillage into water sources and soil. A gas cylinder of 2,000Kg capacity will be installed on a cement slab in the open place but covered with corrugated iron sheets at a distance of 20 meters from the kitchen and connected to cookers by pipes buried under the ground. Hazardous chemicals are not expected to be used at the lodge. However, if the need to fumigate the lodge compound arises the services of a professional firm will be hired. Whereas fumigation will be done when the lodge will be occupied by few workers preferably during off tourist seasons, fumigators will be obliged to vacate and remove from the site all equipment, remaining insecticides and empty containers on completion of the fumigation and dispose them at designated sites outside the park.

(e) Solid waste management

On average, approximately 160kg and 80kg of solid waste of all kinds will be generated daily both by visitors and lodge employees during high and low tourist seasons respectively. This estimation assumes that each person will generate an average of 1kg per day and the average occupancy will be 100 and 50 per cent during high and low seasons respectively. Waste to be generated will be comprised of different kinds ranging from that, which is decomposable including food leftovers, combustibles such as lunch boxes and other parking materials to non-degradable garbage, which will mostly be plastic papers and bottles, glass materials and cans.

Management of solid waste will first and foremost involve the purchasing of supplies that are packed in decomposable containers. This will be followed by proper sorting and provision of containers for disposing different types of waste. After separating the waste into different containers, wet waste, which will be relatively fewer than any other waste approximated to be 40kg per day during high season and about 20kg during low tourist season, will be air-dried in special compartments protected from scavengers by wire mesh then compressed using a small portable crushing machine of the capacity to compress 40kg per day. This machine normally crushes food remains to one-third of the original volume meaning that at most only 15kg and 5kg will be left for burning every day. The dried and compressed wet waste will be mixed with an average of 40kg and 20kg per day of burnable waste such as lunch boxes generated during high and low seasons respectively and is burned in an engineering design burning chamber to be covered with a firm lid. Because no fossil fuel will be used to aid the burning, smoke to be emitted into the atmosphere and which will be monitored on monthly basis is expected to be within the Environmental Management (Air Quality Standards) Regulations, 2007 allowable limits (URT, 2007c).

The remaining non-decomposable rubbish estimated to be 80kg per day during high seasons and 40kg during low tourist seasons including plastic and glass bottles, plastic papers and cans will be stored temporarily in different containers with appropriate covers to prevent scavengers at the lodge according to garbage type and later on transported to Arusha city by a contracted and registered company for selling to traders dealing with recycling preferably the “ Maendeleo Plastic and Recycling Company, which is currently known to perform well. Solar appliances including solar panels and batteries and related accessories shall be collected once have expired and sent to traders dealing with recycling

business in the city of Arusha using the same contracted transportation company. Reidijk (2010) reported that the market value of plastic, paper, metal and glass waste that was produced in Serengeti ecosystem could generate more than USD 820,000 annually. Education and awareness to workers and visitors on the importance of proper sorting of waste and procedural instructions and enforcement will make part of solid waste management at the proposed lodge site.

(f) Liquid waste management.

With regard to wastewater and sewage management, the administration of the proposed lodge has first and foremost considered in its operational concept the issue of minimizing water utilization. All toilets will be wash-out water-borne type, using less than three litres of water per flush as opposed to the traditional ones, which use more than five litres. Washing taps will be timed such that once considerable amount of water has been released, the tap closes automatically. Only showers will be provided instead of bathtubs, which normally consume relatively more water than the latter system. Bed sheets and towels will be re-used on request from clients, if one will be spending more than one night.

In swimming pools water re-use will be achieved through reverse osmosis system for re-circulation (see section 2.2). The proposed utilization of recycled wastewater in non-human consumption activities such as cleaning the premises, washing motor vehicles and garden irrigation will form part of water use minimization. Taking all those measures into account, requirement calculations during operation are based on 20 liters utilization in showers and toilets per visitor, an employee and a driver for one day and the remaining 50 per cent for cooking, swimming pools and other related uses, which will need clean water. It is assumed that during low seasons the average occupancy will be 50 guests to be attended by about 40 lodge employees and 10 drives while average occupancy during high seasons will be 60 visitors, 70 workers and about 20 drivers. Thus, an average of 5,000 liters per day ranging from an average of 4,000 liters during low visitor season to 6,000 during high tourist period will be utilized. An average of 70%, which is, 3,500 will turn into sewage and about 2,100liters accounting for 60% of the total wastewater shall be recycled. Currently the Four Season Lodge, which is located at Bilila area within SENAPA, is undertaking wastewater treatment process. However, for the proposed Serengeti-Belabela Lodge the recycled water will not be used by wildlife

Figure 3 shows a generalized schematic of wastewater recycling and activated sludge process. There will be two separate systems for collecting sewage. One system will collect wastewater from toilets and showers and the other from kitchen. In both systems the sewage water will pass through a sieving or mesh screen to remove all large objects that might clog pipes and thus cause substantial damage and inefficiency in the process. The sieved large objects will be directed into a grit chamber where the velocity of the incoming sewage will be adjusted to allow settlement of objects like sand, grit, stones and broken glasses. Wastewater from kitchen, which will contain fat, will pass through a small tank where primary clarifiers will collect floating fat. A one meter deep equalization basin that will be provided with aerators will be constructed downstream the screening and grit removal for sewage coming from showers and toilets through 100mm

PVC pipes to the primary settling tank for sludge collection. The primary settling tank will be equipped with mechanically driven scrappers, which will continuously drive the collected liquid waste towards a hopper at the base of the tank where it will be pumped to the sludge treatment facility. Sewage from both primary clarifiers and settling tank will be directed to an aerated basin system in order to degrade the biological contents contained in the sewage. The aerators will transfer air into the basin required by biological oxidation reactions and also provide the mixing required for dispersing the air. Finally, water will be filtered using a secondary clarifier to produce water that will contain low levels of organic material or suspended matter.

The sludge or sometimes called bio-solids is the residue that will be accumulated in a sewage treatment plant for further conversion before it is finally disposed off in order to reduce its volume and stabilize organic materials. Stabilized sludge does not have an offensive odour and can be handled without causing any nuisance or health hazard. From the receiving container, the sludge will be passed through a dissolved air floatation tank, where solids will rise to the surface and skimmed off. Dissolved air flotation may reduce the total volume of the sludge to half. The thickened sludge will be pulped with steam then passed to thermal hydrolysis in order to break large molecules such as proteins and lipids under heat and pressure. The hydrolyzed sludge will be passed through a flash tank and then to anaerobic digestion, where bacteria will convert dissolved oxygen matter into biogas. While biogas will be tapped, used to produce electricity and make wastewater treatment plant self-sufficient with energy, local people from neighbouring villages will be encouraged to collect dried pathogen-free sludge to be accumulated through dewatering process for use as compost. Performance of the water recycling system will be inspected at least once per month and any indentified breakdown will be rectified immediately.

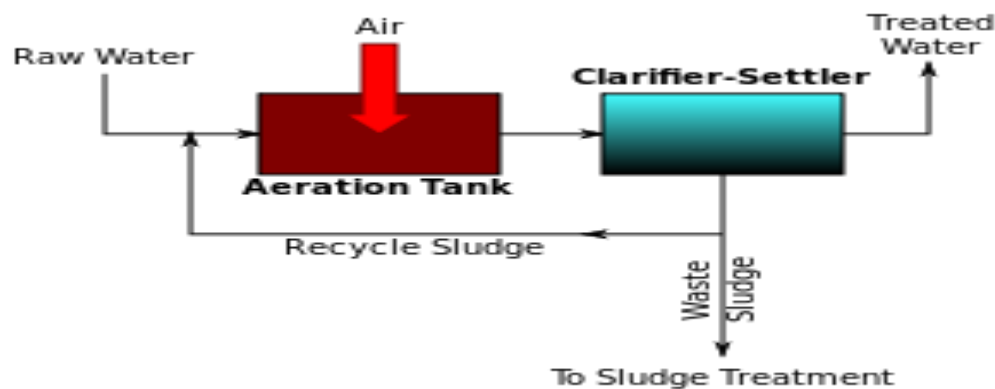


Figure 4 Generalized schematic of wastewater recycling process

Source: encyclopedia Britannica, Inc; visited on 15 January 2018.

2.4.4 Decommissioning

The initial occupancy period of the site according to TANAPA's DALP will be 25 years subject to renewal. The closure of the facility is therefore not anticipated before that period of time has lapsed. In case the business will come to an end due to whatever reason(s), decommissioning activities will entail the following:

- Demolishing some lodge structures,
- Removing the rubble;
- Landscaping;
- Re-planting native vegetation;
- Handing over some structures to SENAPA for Park uses; and,
- Laying off employees.

3.0 POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK

3.1 Overview

Policies, legislation, and international conventions with relevance to environmental conservation, tourism development, poverty alleviation and public health and safety were reviewed in order to assess compliance of the proposed development in SENAPA. Policies, legislation and international conventions and agreements, which were reviewed, are:

3.2 National Policies

3.2.1 National Policies for National Parks in Tanzania (1994)

The National Policies for National Parks in Tanzania provide direction on how to accomplish the mandate of national parks in Tanzania. The Policies recognize that all parks are complex mixtures of values and resources, each with its own unique qualities and purposes, requiring specific treatment in the development and implementation of management plan strategies and operational systems (TANAPA, 1994). Within its policy context, TANAPA envisages to promote and regulate the use of parks and provide those services necessary to meet the basic needs of park visitors and to achieve each park's management objectives. The policies provide that only those activities, which contribute to the understanding and appreciation of the park resources, will be allowed and only to the extent that tangible heritages including natural, cultural and scenic resources and intangible resource values, which are wilderness character and visitor experience are not impaired. Further, the policy points out that all human settlement, except TANAPA staff, authorized researchers and advisors as well as employees in accommodation facilities will be prohibited in all national parks. Notwithstanding to the above exception, authorized human settlement will be kept at minimum level and for essential personnel only.

TANAPA policy recognizes that while zoning will be a tool for park management, it will consider the capability of land to support appropriate uses and will be used as a framework for specific planning and management decisions on use and development of the park. This objective is taken care of by SENAPA-GMP of 2006-2016 and draft of 2017. The purpose statement outlined in both versions of the GMP is to conserve and protect Serengeti ecosystem, its habitats, biodiversity, migration of large mammals and birds and its endemic, rare, endangered and threatened species (TANAPA, 2006; 2017). To realize this purpose statement, zoning has been singled out as one of the management tools, which aims at providing framework to achieving and reconciling the twin management needs of protecting the natural qualities and environment of the Park as well as regulating and promoting visitor use. The proposed lodge will be constructed in the "High Use Zone" according to SENAPA zoning scheme which is designated for establishment of ecologically and environmentally-friendly lodges and/or tented camps (TANAPA, 2006; 2017).

In order to avoid adverse effects on the environment, the policies require the conduction of EIA on all major actions, developments and activities within and adjacent to national parks' boundaries. Through EIA process, decision-makers will be provided with

sufficient information to make informed decisions with full understanding of potential impacts, both positive and negative. Step-by-step procedure for seeking approval to develop facilities or activities within any national park in Tanzania is provided in TANAPA's DALP. Relevant to environmental protection is section four, which provides for environmental criteria checklist to guide the conduction of EIA that serves as the basis for both project planning and evaluation (TANAPA, 1994). It is under this background with respect to EIA conduction as provided in the TANAPA-DALP, the developer commissioned this study to ensure that the EIA clearance certificate is issued before effecting step 15 of DALP, which involves the signing of a lease agreement. The commissioning of this EIA prior to implementing the proposed project within SENAPA signifies the commitment of the developer to conforming to the National Policies for National Parks in Tanzania of 1994.

3.2.2 National Environmental Policy (1997)

Tanzania is aiming at achieving sustainable development through rational use of her natural resources and incorporating measures in any development activities in order to safeguard the environment. The National Environmental Policy seeks to provide the framework for making fundamental changes that are needed to bring environment consideration into the mainstream of decision-making in the country. Two out of the major environmental problems, which the policy outlines, are environmental pollution and land degradation (URT, 1997). The policy emphasizes that environmental considerations should not become an afterthought in planning and decision making; instead, it should be part of a conscious awareness of Tanzania's development realities.

Tanzania's environmental standards provide guidance to decision-makers and practitioners on the minimum acceptable levels to which the project in question should adhere to. They also provide a quantifiable measure for use in the review process. In Tanzania, the National Environmental Standards are mainly focusing on municipal and industrial wastewaters and the impacts they may cause on potable water, air quality and other related effects that may be caused by activities undertaken from the same undertakings such as noise pollution. These standards provided by the Tanzania Bureau of Standards (TBS) are categorized into three groups, namely (i) compulsory standards, (ii) those, which may be implemented on voluntary basis and (iii) standards which have requisite test methods that should be followed when testing compliance.

Compulsory standards are categorized as generic or specific. Whereas specific standards cover those industries with peculiar effects to the environment, generic standards regulate activities in industries, which have no unique outcomes to the environment. Standards that may be implemented on voluntary basis include the ones which may not necessarily be directly enforced, but whose results are implied in some regular requirements such as the Environmental Management Systems (EMS) standards and the 701/International Standards Organization (ISO) 14001, which compliance specifications include relevant legal requirements. This category of standards has important requirements for companies, which or whose developers wish to demonstrate their commitment to sustainable development by way of self-regulation mechanism.

In the last category, the test methods are not intended to be compulsory but in case of disputes, test methods are used as long as they are reliable and therefore are dependent upon as the standard procedure. Thus, in some circumstances the test methods become obligatory requirement tied to the specification standards in order to ensure reproducibility of results. Since Tanzania has to-date few agreed national standards for environmental quality specific to tourism industry, the developer shall comply with available codes of practices particularly those provided in the National Policies for National Parks in Tanzania of 1994 (TANAPA, 1994), the TANAPA-DALP of 1995 (TANAPA, 1995) and the SENAPA-GMP (TANAPA, 2006; 2017) in order to demonstrate the developer's commitment to sustainable conservation within the area of operation and surrounding environments. Where national standards will not be explicit, the developer shall apply internationally agreed standards such as World Bank Safeguard Policies and World Bank Group Environmental and Safety and Health Standards. Since the developer is aware of this policy, most of the relevant national and international environmental standards were reviewed during this EIA study for the purpose of ensuring that the project conforms to them during all phases of its implementation.

3.2.3 National Tourism Policy (1999)

The National Tourism Policy (URT, 1999) seeks to assist efforts, which promote the economy and livelihood of the people, essentially poverty alleviation, through encouraging the development of sustainable and quality tourism facilities that are culturally and socially acceptable, ecologically friendly, environmentally sustainable, and economically viable. This requirement matches well with the National Strategy for Growth and Poverty Reduction (NSGPR), 2005, which out of its three policy outcomes, two are relevant to the National Tourism Policy. These are growth of income and reduction of poverty as well as improved quality of life and social well-being. At the micro economic level, construction and later on operation of the proposed Serengeti-Belabela Lodge in SENAPA will contribute to the improvement of livelihoods of people residing in its vicinity particularly those from Serengeti and Bunda districts through employment and its multiplier effects. The facility will also contribute to the districts' economic growth as some of the local building materials and foodstuffs will be purchased from Mugumu and Bunda townships, which are the headquarters of Serengeti and Bunda districts respectively.

The National Tourism Policy further seeks to market Tanzania as a favored tourist destination and thus increase progressively the number of tourists visiting the country (URT, 1999) in order to increase the contribution of the sector to the country's Gross Domestic Product (GDP). M/s Kamal Alloys (Avika Hotels and Resorts Limited) is quite confident to achieving the proposed business target based on experience of an international Sarovar Hotels and Resorts Company in the tourism industry and marketing strategies, which the developer plans to partner with in this project. Sarovar Hotels and Resorts Company is well versed with tourism business environment, including competition, marketing techniques and complications in the international market as well as ups and downs of the business.

The National Tourism Policy is backed up by the National Tourism Master Plan of 2002, which outlines strategies to improve the industry by addressing the constraints identified in the Policy. The plan recognizes that, one of the important aspects towards the development of diverse and high quality products, services and tourism infrastructure and facilities is the attraction of investment capital to meet the target market. The master plan thus advocates for improvement of tourism facilities with increased involvement of private sector in the development of such facilities. Notwithstanding the advocacy of the plan to diversifying tourist products, it also acknowledges the importance of protecting the natural environment on which most of Tanzania's tourism is totally dependent from overuse. The core of the National Tourism Master Plan is therefore to develop an integrated tourism product that is capable of attracting low volume, high yield segment of the international tourism market to spend their entire holiday in Tanzania (URT, 2002a). This is the reason why M/s Kamal Alloys (Avika Hotels and Resorts Limited) is proposing to construct and later on operate in partnership with an international company, a medium-sized lodge that will provide high quality services and attract low volume tourist in order to secure the integrity of an environment.

3.2.4 National Wildlife Policy (1998) revised in 2007

The National Wildlife Policy recognizes the importance of the "Arusha Manifesto" to wildlife conservation in Tanzania, which state that, *"the survival of wildlife is a matter of grave concern to all of us in Africa. These wild creatures amid the wild places they inhabit are not only important as a source of wonder and inspiration, but are an integral part of our natural resources and our future livelihood and well being. In accepting the trusteeship of our wildlife we solemnly declare that we will do everything in our power to make sure that our children's grandchildren will be able to enjoy this rich and precious inheritance"*. This statement, which was made by the first President of Tanzania; Mwalimu Julius K. Nyerere in 1961 is, the core of majority of the provisions contained in the National Wildlife Policy of 1998. The policy provides among other stipulations that, the existence of wildlife in the country will be achieved through system plan of Protected Area (PA) network whose overall objective is to enhance conservation and promote socio-economic development of people in Tanzania. The policy advocates further for sustainable utilization of wildlife resources and requires all "significant" development projects in wildlife protected areas to be subjected to EIA (URT, 2007a). The commissioning of this EIA study for the proposed project signifies the awareness the developer on this Policy and how committed the investor is, to complying with it. In view of that, this EIS addresses wildlife conservation and habitat protection at the proposed site and surrounding areas as prerequisite to conforming to the Wildlife Policy of Tanzania.

3.2.5 National Energy Policy (2003)

The National Energy Policy of 2003 insists on the need to consider the environment in its totality. Issues such as energy production, procurement, distribution and utilization systems should be done in an environmentally sound manner. This policy requires the undertaking of EIA before the exploitation of new energy resources, followed by environmental impacts at each stage of energy development project. In addition, the

policy recognizes harmful activities involved in the construction of electricity facilities, their operation and maintenance (URT, 2003). Since the developer recognizes that fossil fuel and wood-based energy contribute more pollutants to the environment compared with other sources such as solar power and LPG, in absence of power from the Tanzania Electrical Supply Company (TANESCO) within the proposed area, the major energy sources will be solar for lighting and LPG for cooking. Fossil fuel particularly diesel will be used to run a back generator, a water pumping machine and logistic vehicles. A 150kV generator set, Poweric Cummuunis model made in India will be linked to the solar power supply system to backup electricity supply in case of insufficiency energy from the sunlight. This type of a generator is emission-compliant and a silent-domestic set approved as an environmentally-friendly machine. One machine produces an average of less than 5.0mg/kg and 0.08mg/kg of carbon-dioxide and black smoke/particulate matter per day respectively, which are within permissible weight concentration limits. The Environmental Management (Air Quality Standards) Regulations, 2007 limits carbon-dioxide and black smoke/suspended particulates to concentration in weight in the air not exceeding 10mg/kg and 0.08mg/kg per day respectively (URT, 2007b). In addition to being a low-noise making, the generator will be housed in a sound-proof room.

3.2.6 National Land Policy (1995)

The major theme of the National Land Policy is the conversion of land into an economic asset to which all citizens will benefit from (URT, 1995). The implication of this attitude is that, vast economic possibilities will be opened to the masses of the rural people, as there is enough land for every citizen capable of managing and deploying it to productive use. However, the policy provides that land will be allocated to investors according to their ability to develop it while safeguarding the interest of citizens over the land in question. The main aim of this policy, which is in favour of environmental conservation and economic development and which this project aspires to achieve, is the optimal use of land resource in SENAPA and facilitation of broad-based social and economic development without upsetting or endangering the ecological balance of the Park. This is the reason why M/s Kamal Alloys (Avika Hotels and Resorts Limited), which is one of the companies committed to develop high class tourist lodge in SENAPA without compromising natural resources conservation interests and ensuring livelihoods improvement of the surrounding communities was given opportunity to develop the proposed facility.

3.2.7 National Forest Policy (1998)

The main goal of the Forest Policy of 1998 is to enhance the contribution of the forest sector to sustainable development in Tanzania and the conservation and management of her natural resources for the benefit of the present and future generations (URT, 1998a). Among the objectives of the Forest Policy, which are relevant to this project are assurance of sustainable supply of forest products and services by maintaining sufficient forest areas under effective management, and reassurance of ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility.

It is the obligation of TANAPA to ensure that natural resources which are found in SENAPA including the forests are sustainably conserved. Being one of the prospecting

investors in SENAPA, M/s Kamal Alloys (Avika Hotels and Resorts Limited) will join hands with other stakeholders including TANAPA to ensuring that the forest conservation goal is achieved by limiting the cutting down of trees to minimum level during construction, replanting indigenous vegetation after construction works and refraining from using firewood from within the Park.

3.2.8 National Water Policy (2002)

The aim of the National Water Policy of 2002 is to develop a comprehensive framework for sustainable development and management of the nation's water resource and putting in place an effective legal and institutional framework for its implementation (URT, 2002b). The Policy notes the imminent danger of facing water scarcity in few years to come. According to the policy, the annual average water availability per capita was predicted to decline by 45 per cent from 2,700m³ cubic meters per year in 2002 to about 1,500m³ in 2021 (URT, 2002b). So long as this policy recognizes the fundamental but intricate linkage between water and the socio-economic development including environmental requirements, and because the developer is aware of the policy needs, the concept for the development of the proposed lodge has taken into consideration several mechanisms to limit water utilization like the installation of water serving devices and wastewater recycling. Pollution regulatory methods to both surface and underground water such as proper management of liquid waste also contribute to the commitment of the developer to managing the water resource in the Park.

3.2.9 National Cultural Policy (1997)

The National Cultural Policy recognizes that cultural industries shall be identified and encouraged to contribute towards national economic development. The government shall also supervise the promotion of cultural heritage and their protection shall remain to be a public responsibility (URT, 1997a). The policy emphasizes on the close linkage between cultural and natural resources on one hand and the environment and development programmes on the other hand. It also recognizes that the public remains free to earn a living from cultural activities. SENAPA-GMP acknowledges that within the park there are some cultural resources, which are associated with human habitation before the area was declared a national park (TANAPA, 2006; 2017). It is the intention of the developer to take care of cultural resources during all phases of the project implementation, if at all will be revealed that they do exist within or in surrounding areas where the lodge will be constructed. Further, the developer shall offer opportunity for local community to share their culture with visitors at the lodge particularly the performance of traditional dances, which will enable them to earn income.

3.2.10 National Employment Policy (1997)

Employment in Tanzania falls into two main categories namely, wage and self employments. In both categories, employment is defined as any acceptable activity in which a workforce is actively engaged. Such activity yields payment in some form, which accrues to a worker as an income required to meet his/her basic needs (URT, 1997b). In view of that, the National Employment Policy of 1997 directs for effective ways and means of utilising available human resource with the ultimate objective of combating

poverty. The policy also sets a venue for inculcating people into the culture of self reliance through diligent and hard work. So long as the proposed project will create opportunities for employment and avenue for some people to provide other services such as interpretative works and performing traditional dances before the lodge visitors, the developer has laid down strategies, which are described in this EIS on how people in the vicinity of the project should benefit by earning income from its presence.

3.2.11 National Policy on Gender and Equity (1999)

The key objective of the Policy on Gender and Equity (URT, 1999a) is to provide guidelines that will ensure the development of gender sensitive plans and strategies in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it puts emphasis on gender quality and equal opportunity for both men and women to participate in development undertakings and to value the role-played by each member of the society. Despite its plan to ensuring equal involvement and opportunity in employment for both masculine and feminine gender in its operation, where a female will have similar qualifications with a male to a specific position, M/s Kamal Alloys Limited employment policy puts emphasis to giving priority to ladies.

3.2.12 National Health Policy (1990)

The National Health Policy aims at improving the health status of all people wherever they are; in urban and rural areas by reducing morbidity and raising life expectancy (URT, 1990). Good health including physical, mental and social well-being is a major resource for economic development. The overall objective of this policy is to improve the health and well-being of all Tanzanians, with a focus to those most at risk and to encourage the health system to be more responsive to the needs of the people (URT, 1990). Whereas a dispensary with qualified medical staff will be available at the lodge during operation phase, it is the policy of M/s Kamal Alloy Limited to avail workers with uniforms, provide meals and medical services. Transport to referral hospitals for complicated cases and relevant safety working gear as well as good working environment that moderate accident risks shall be provided. Such a policy testifies that the developer is committed to complying with the national Health Policy of 1990.

3.2.13 National Policy on HIV/AIDS (2001)

HIV/AIDS is a social, cultural and economic problem but females need extra consideration to protect them from increased vulnerability to the disease. Due to the fact that HIV infection is mainly through heterosexual intercourse, the problem touches on private life styles of individuals. But the risk is highest among young people and especially girls. Girls and women in our social and cultural environments are more vulnerable to HIV infection as they do not have much control over their sexuality (URT, 2001). Poverty increases the vulnerability of HIV infection as some women engage in high risk sexual behaviour for survival (URT, 2001). The fact that the proposed project will give higher priority to females with requisite qualifications during employment and because the developer intends to initiate special incentives for ladies to build their interest to work in a remote area at the proposed Serengeti-Belabela Lodge, both plans will make

female employees earn some income and reduce their economic problems and consequently refrain from engaging themselves in sexual behaviour, which in most cases men use as a tool to meeting their sexual desires.

3.2.14 National Trade Policy (2003)

The goal of the National Trade Policy is to facilitate smooth integration into the Multilateral Trading System (MTS) and reduce marginalization among her people (URT, 2003a). The policy intends to ensure that liberalization offer meaningful, identifiable and measurable benefits to Tanzania citizens. The main objective of this policy is to raise efficiency, widen linkages in domestic production and build a diversified competition in export sector as the means of stimulating higher rates of growth and development (URT, 2003a). The proposed lodge will contribute to the highly needed foreign currency earnings in Tanzania and therefore it tallies well with the National Trade Policy, which emphasizes on the private sector to engage itself in businesses that build a diversified and competitive export trade, which contribute to the country's economic growth.

3.2.15 National Investment Promotion Policy (1996)

The National Investment Promotion Policy of 1996 presents an outline of the country's economic development with regard to political, economic, infrastructural communication and legal systems that are currently in place. The policy recognizes that Tanzania endeavours to build a typical self-sustaining economy focussing on the development of its human resources that is, a society of educated and healthy individuals with a dynamic culture and sustainable economy. With this policy, Tanzania is geared towards creating an open market economy, which focuses on creating an enabling environment for private sector development, undertaking structural reforms and liberalizing the economy (URT, 1996). Specific to tourism industry of which this development project belongs, the policy encourages the expansion and a diversified tourist industry by improving supportive infrastructure services, the quality and efficiency of service delivery and preservation of the natural environment. Other areas, to which the policy focuses are, to encourage local and foreign investors to invest in tourist services and infrastructure, engage in more active tourist publicity and marketing arrangements both domestically and internationally, strengthening tourism institutions and enhancing coordination among tourist services delivery participants.

The National Investment Promotion Policy spells out obligations of investors, which among others include (i) being serious and highly committed to participate in the country's development and in Government's efforts to alleviate poverty as well as obeying to the laws of Tanzania (ii) supplying in a timely manner, required information to investment-support institutions to enable them implement their functions efficiently and effectively (iii) facilitating access to relevant investment-support institutions information on the enterprise as required by the law and other relevant institutions and, (iv) undertaking investment activities in a manner that best contributes to consumer and environmental protection, industrial harmony, the creation of gender balance and the development of human resources (URT, 1996).

The fact that M/s Kamal Alloys (Avika Hotels and Resorts Limited) was given an offer by TANAPA to construct and later on operate a lodge in SENAPA (Appendix 2) and qualified for issuance of an investment certificate by the Tanzania investment Centre (TIC) to invest in the management of Serengeti Belabela Lodge (Appendix 5), there is no doubt that the proposed project complies well with relevant requirements of investing in tourism industry in Tanzania and therefore is in conformity to the Investment Promotion Policy .

3.2.16 National Construction Industry Policy (2002)

The development of the proposed-Belabela Lodge in SENAPA will involve construction works. Among the major objectives of the National Construction Industry Policy, which support the tourism sector are the promotion and application of cost-effective and innovative technologies and practices that sustain the socio-economic development activities and the use of practices, technologies and products, which are not harmful to both the environment and human health (URT, 2002c). In order to comply with this Policy requirement, architectural design of the proposed project considers among other issues the opposing characteristics of permanence and temporary set up of lodge facilities and the use of local building materials such as poles, stones and thatch grass that are not harmful to human health and which will blend the structures with the environment.

3.3 Legislation

3.3.1 Environmental Management Act, Cap. 191 (2004)

The Environmental Management Act, 2004, which became into operation on 1st July 2005, has continued to be an umbrella law on environmental management in Tanzania (URT, 2004). EMA is comprehensive and provides for division of roles and mandates among actors involved in environmental activities and development projects. Amongst major purposes of EMA are, to provide for legal and institutional framework for sustainable management of the environment in Tanzania; to outline principles for management, impact and risk assessment, prevention of pollution and waste management. It also provides for clear participation of the public in the implementation of development projects and compliance with environmental quality standards. The Act further provides basis for implementation of international instruments on environment and the National Environmental Policy of 1997. This EIA study was therefore commissioned to ensure that the project implementation during all phases of the project complies with all environmental conservation, socio-economic development and safety and human health as provided in the Act.

3.3.2 EIA and Audit Regulations (2005)

To support the implementation of EMA, 2004, the Government prepared EIA and Audit Regulations, 2005, which among other provisions identify potential projects requiring mandatory EIA and outline procedures for conducting EIA and Audit studies (URT, 2005). These Regulations strongly advocate for stakeholders consultations at all stages of EIA study and encourage for periodic and independent environmental assessments so that outcome of such assessments could inform further environmental management process.

This is the reason why this EIA was undertaken with emphasis put on stakeholders' involvement and preparation of both the mitigation and monitoring plans so as to comply with these Regulations.

3.3.3 Tourism Act (2008)

The Tourism Act, 2008 provides for institutional framework, administration, regulation, registration and licensing of tourism facilities and activities, and for related matters. Part III, section 8 of this Act stipulates that no person shall conduct or operate a tourism facility or activity unless such tourism facility or activity is registered (URT, 2008). Section 10(1) emphasizes further that any person who is conducting, operating or intends to conduct or operate a tourism facility or activity, which is required to be registered or graded under this Act shall apply to the Director of Tourism for a certificate of registration in the form set out in the Second Schedule of this Act (URT, 2008). Relevant to environmental conservation, the Act provides that the Director shall, in determining the matter under sub-section (3), ensure that the provisions of EMA relating to EIA are complied with (URT, 2008). The fact that the developer of the proposed project applied for an issuance of the tourism business license the Director of Tourism and was advised to be granted the same after the business has come into operation (Appendix 6), the license acquisition process will assume once construction of the lodge has been completed.

3.3.4 Tanzania Investment Promotion Act (1997)

According to this Act, Tanzania Investment Centre (TIC) is the overall facilitator and acts as a one stop-permitting centre for investors in all fields in the country (URT, 1997c). This project has relevancy to this Act because being an investor in the tourism industry, which is one of the sectors needing incentive certificate, the developer of the proposed Serengeti-Belabela Lodge was obliged to apply for that certification, which was granted vide certificate number 032266 of 21st August, 2017 (Appendix 5) in line with Section 17 of the Tanzania Investment Act of 1997 (URT, 1997c).

3.3.5 Land Act, No. 4 (1999)

For the purpose of land management under this Act and all other laws applicable to land, the Land Act of 1999 provides that land in Tanzania is divided into three categories namely; public land, village land and reserved land. However, the President may transfer or exchange land from one category to another. Reserved land is divided into different groups among them are, the forests, which are protected under the Forest Act of 2002 (URT, 2002d), NCA under the NCA Act Chapter 284 R.E of 2002 (URT, 2002e) and National Parks under National Parks Act Chapter 282 R.E of 2002 (URT, 2002). The Land Act specifies that subject to the provisions of the Act, the holder of a granted right of occupancy; for the case of this project being TANAPA, may lease that right of occupancy or part of it to any person for definite period or for the life of the landlord or the leaseholder or for a period, which though indefinite may be terminated by the land owner or renter, and subject to any conditions, which may be required by this Act or any other law applicable to leases or which he may think fit (URT,1999b). The developer has

already submitted a business plan to TANAPA waiting the land lease agreement signing by both parties after this EIA study has been approved by the Minister responsible for environment. This achievement authenticates that the developer will officially be leased part of right of occupancy in SENAPA, which among other issues shall indicate the lease period and land coverage pursuant to the Land Act No. 4 of 1999 .

3.3.6 Village Land Act No. 5 (1999)

The Village Land Act No.5 of 1999 is arguably amongst the laws that most directly impact the well-being of most Tanzanians. The Act advocates that the major parts of the administration of land have been decentralized to the village and that there are firm guarantees in place to protect the smaller-holder security of tenure. Fundamentally, the Act vests all village land in the village. The precise distribution of authority between the Village Council and the Village Assembly is not always defined, but the underlying principle is clearly that Village Land is vested in the Village Assembly and that the Village Council administers the land through the authority of the Village Assembly. Section 60 of the Act makes special provisions for the establishment of a Village Land Council “to mediate between and assist parties to arrive mutually acceptable resolution on any matters concerning the village land. Despite that construction of the proposed lodge will be done in SENAPA some local building materials will be collected from village lands, thus all village by-laws particularly those pertaining to acquisition of those materials shall be adhered to by the developer.

3.3.7 Wildlife Conservation Act, No. 5 (2009)

Wildlife management in Tanzania is governed by the Wildlife Conservation Act (WCA) of 2009, which allows the Government to establish protected areas and outlines how these reserves are to be organized and managed. National Parks is one of the categories of protected areas in Tanzania recognized by this Act and established for the protection, conservation, development, regulation and control of fauna and flora contained in parks. The Act also provides legal framework for various uses particularly of wildlife resource within and outside protected areas including the national parks (URT, 2009). The fact that the developer sought permission from TANAPA, which is a State-owned organization and recognized by the WCA, to construct and later on operate a lodge within SENAPA, is an testimony that the developer is aware of the Act with a recognition in mind that the business has high potential to contributing to tourism industry, which is known to be one of the major forms of optimal wildlife utilization in the country.

3.3.8 Forest Act (2002)

The Forest Act controls forestry development in Tanzania. The most significant provision in the Forest Act with regard to the proposed project is biodiversity conservation. Sovereignty over biological resources, their derivative products and intangible components are also affirmed in this Act (URT, 2002d). In order to ensure that trees at the site where the proposed lodge will be conserved and its surrounding environment preserved, felling will be limited to unavoidable circumstances and planting of indigenous species to the area will later on be undertaken after landscaping in order to restore the environment as natural as possible and by so doing reinstate the area’s inherent biodiversity. During all phases of project development no firewood will be

collected from the park. In case need arises for having firewood to make camp fire, it will be screened for biological invasions and brought inside the park from outside.

3.3.9 Tanzania National Parks Act, Cap. 282, R.E (2002)

TANAPA is a State-owned organization that was established by TANAPA Act, Cap. 282 (R.E) of 2002 to manage and regulate the use of areas designated as national parks for the purpose of preserving the country's heritages of natural and cultural resources (URT, 2002). According to the United Nations Education, Science and Culture Organization (UNESCO)'s PAs categorization, national parks represent the highest level of resource protection. Thus, the mission of TANAPA is to sustainably conserve and manage parks' resources and their aesthetic values for the benefit of present and future generations of mankind and also to provide high class tourism products. The Act specifies the powers of TANAPA Board of Trustees, one of them being to control and regulate the manner in which any person granted any right, title, interest, authority, concession or licence to operate hotels, shops or other facilities for use of visitors to any national park may excise the same within a national park. Because M/s Kamal Alloys Limited (Avika Hotels and Safaris Limited) is aware of this Act, the Company has adhered to the directive of TANAPA, which required the developer to conduct an EIA of the proposed lodge before any construction activity has commenced so that relevant authorities are in position to make informed decisions.

3.3.10 Land Use Planning Act, No. 6 (2007)

Basically, the Land Use Planning Act of 2007 requires land uses to be organized in a planned fashion, with certain approvals from respective government authorities (URT, 2007b). Among other issues, the Act requires all land in the country to be used for the benefit of people referred to as "beneficial use"; meaning the use of land that is conducive to public health, welfare and safety. Section 45(1) specifies that any approved plan shall apply to the area or zone to which it relates. It stipulates further that every person, agency or relevant planning authority shall comply with the requirements of the approved plan. Section 47 spells out that any landholder or occupier of land shall take all steps necessary to ensure voluntary compliance with aspects of an approved plan that are relevant to activities carried out on the land one holds or occupies (URT, 2007b). The Msabi-Kirawira area where the proposed lodge will be constructed falls within a "High Use Zone" according to SENAPA-GMP (TANAPA, 2006; 2017). The offer for implementing this project, which was granted by TANAPA took in cognition that while the project will benefit the country, it will also continue to be implemented in a manner that augurs with the requirements of the National Policies for National Parks in Tanzania (TANAPA, 1994) and SENAPA-GMP (TANAPA, 2006; 2017), which the developer is aware of, and committed to comply with.

3.3.11 Water Resource Management Act (2009)

Enacted in order to control and protect water resources, the legislation defines water as all water flowing on surface or contained or flowing in or from a spring or stream or natural lake, swamp or in or beneath a watercourse (URT, 2009a). The Act puts in place a regime of water rights to govern access to water use. This law was enacted to provide for institutional and legal framework, adhere to sustainable management and development of water resources and to outline principles for water resource management. The Act also provides that pollution control norms are embodied in the water rights. In order to comply with the requirements of water conservation in the country according to the Water Resources Management Act of 2009 (URT, 2009a), the developer plans to drill a deep borehole in the vicinity of the proposed site before construction activities have started, which the hydro-geological survey has already been conducted (Appendix 9). The developer will therefore seek a drilling permission from respective water basin office and water shall be subjected to chemical and bacteriological analysis to confirm with the national standards for human consumption and other uses.

3.3.12 Environmental Management (Air Quality Standards) Regulations (2007)

The objectives of the Environmental Management (Air Quality Standards) Regulations of 2007 are to set baseline parameters on air quality and emissions based on a number of practical considerations and acceptable limits, enforce minimum air quality standards, help developers to keep abreast with environmentally friendly technologies and to ensure protection of human health and the environment from various sources of pollution (URT, 2007a). The Regulations provide that once the National Environmental Standards Committee of the TBS has set minimum air quality standards and approved by the Minister responsible for environment, every person shall be required to comply with those limits. The Regulations provide further that if any person contravenes Section 8(1) and 8(2), which prohibit emission of hazardous substances, chemical, gas etc. may be ordered by the court to pay the cost of removal, in the course of restoring the damaged or destroyed environment as a result of the discharge. Section 8(3) mandates NEMC with general powers to ensure purposeful enforcement of the Regulations. The developer is aware of these Regulations and this is the reason why the Company commissioned this EIA study in order to ensure that best method(s) for preventing or minimizing adverse effects on human health and on the environment like the use of solar energy for lighting and LPG for cooking, which are known to produce relatively lesser pollutants than biomass-based and fossil fuel are adopted.

3.3.13 Environmental Management (Water Quality Standards) Regulations (2007)

The Environmental Management (Water Quality Standards) Regulations, 2007 provide that the National Environmental Standards Committee of TBS shall prescribe classifications, criteria and procedure for meeting standards of water quality for approval by the Minister responsible for environment (URT, 2007). In the course of prescribing the above, the Committee shall establish minimum quality standards for all waters of Tanzania, minimum standards for the treatment of effluent before their final discharge into public sewer system and minimum quality standards for different uses of water including drinking and recreational water. The Regulations provide that any person who knowingly puts or permits to put into any stream solid refuse, rubbish, poisonous,

noxious or any other waste including liquid discharged from any factory or manufacturing process or interferes with soils and vegetation that protect water sources and/or pollutes ground water will be committing an offence. The developer of the proposed project is aware of these Regulations and therefore the Company shall file through the District Environment Office a statement to NEMC indicating the anticipated impacts on the environment to emanate from the existence of the facility within 21 days after the water use permit has been granted by respective water basin office. If the water use permit is granted, the developer shall further comply with effluent or receiving water standards prescribed by any other written law provided that they are not below the standards prescribed under these Regulations. The developer is also committed to commissioning a study for assessing chemical, physical, microbiological and bacteriological parameters of water from the deep borehole to be drilled in the vicinity of the proposed lodge so as to ensure limits for drinking water quality as well as for other uses are adhered to, as prescribed in the fifth and sixth schedules of these Regulations.

3.3.14 Food, Drugs and Cosmetics Act (2003)

Part III of this Act provides for efficient and comprehensive regulation and control of food substances like edible oils. In accordance with this Act, Tanzania Food and Drugs Authority (TFDA) regulates the importation, manufacturing, labeling, marking, storage, promotion, selling and distribution of food (URT, 2003b). The Act also provides opportunity for examination of food intended for human consumption. Directed by this Act, TFDA may seize or remove any item that appears unfit for human consumption (URT, 2003b). So long as the proposed lodge will be serving meals to its clients and providing food to its employees, the developer shall from time to time check for the compliance of this Act by food traders and cooperate with TFDA whenever they need to examine food intended for human consumption. By doing so the project will be complying with the provisions stipulated in this Act.

3.3.15 Employment and Labour Relations Act, No. 6 (2004)

Employment and Labour Relations Act makes provisions for core labour rights; establishes basic employment standards; provides a framework for collective bargaining; provides for the prevention and settlement of disputes and provides for related matters (URT, 2004a). The Act applies to all employees including those in the public service of the Government of Tanzania in the Mainland excluding members, whether temporary or permanent in service of the Tanzania People's Defence Force, the Police Force, the Prison Service and the National Service. The principal objectives of the Act are:

- To promote economic development through efficient productivity and social justice;
- To provide the legal framework for effective and fair employment relations and minimum standards regarding conditions of work;
- To provide a framework for voluntary collective bargaining;
- To regulate the resort to industrial action as a means to resolve disputes;

- To provide a framework for resolution of disputes by mediation, arbitration and adjunction; and,
- Generally, to give effect to the core conventions of the International Labour Organization as well as other ratified conventions.

Section 5 of this Act prohibits child labour of under 14-year olds and restricts labour of 14-18-year olds to light work, which is not harmful to the child health or development or prevents the child's school attendance. The same section prohibits labour of less than 18-year olds in mines, factories, ships or any other work sites including non-formal settings or agriculture, where conditions can be considered hazardous for the child. Sub-section 7(1) provides for employers to ensure the promotion of equal opportunities and elimination of discrimination in employment practices (URT, 2004a). While age limitation will be observed during recruitment of employees, the Company's employment policy states that recruitment shall be based on qualifications, experience and skill and therefore no discrimination of whatsoever kind is anticipated during employees' recruitment.

3.3.16 National Public Health Act, No. 1 (2009)

The National Public Health Act No.1 of 2009 (URT, 2009b) provides for the promotion, preservation and maintenance of public health with a view to ensuring the offering of comprehensive, functional and sustainable public health services to the general public and to provide for other related matters. Section 75 requires for separation at source of different kinds of garbage and gives standards to guide the type, size, shape, color and other specifications for containers with the aim of ensuring proper management of both solid and liquid wastes. Section 82 stipulates on how gaseous waste should be handled. Whereas sorting of waste into different types and disposing the same temporarily at the lodge before collecting and dumping it outside the premises by a registered company shall be observed, impact that may arise from LPG due to its nature of flammability shall be taken care of, by keeping the gas in standard tanks, erected above the ground on cement slab with fire distinguishers placed on the sides of the open shelter, covered with corrugated iron sheets.

3.3.17 Occupational Safety and Health Act (2003)

The Act makes provisions for safety, health and welfare of persons at work in factories and all other places of work. It also provides for the protection of persons other than persons at work against hazards to safety and health arising out of, or in connection with activities of persons at work (URT, 2003c). Relevant provisions of the Act to the proposed lodge development are stipulated in Part (IV) section 43(1), which is concerned with safe means of access, safe working place and protection of fire and part (V), which provides for health and welfare of people at work places. To a large extent all of the above provisions will be complied with in particular the provision and enforcement for use of personal protective equipment and placing precaution signs in areas of high risks such as areas with potential to encountering wild animals and fires in order to ensure safety of employees, visitors and other people within the site both during construction and operation phases.

3.3.18 Fire and Rescue Services Act, R.E (2002)

This Act provides for better organization, administration, discipline and operation of fire and rescue brigade services. It stipulates that if the Commissioner responsible for fire and rescue services is satisfied that there exists in any premises of any fire hazard, he may serve a fire hazard abatement notice in the prescribed form requiring the concerned person to abate the situation within the period specified in the notice. Such a notice may be served to either (a) a person who by any reason of whose act, default or sufferance the fire hazard arose or continues, or (b) if such a person or such other person is the servant or agent of some other person, or (c) if such a person or such other person, the case may be, cannot readily be found or is absent from the United Republic upon the occupier or the owner of the premises in which such fire hazard exists (URT, 2002f). The proposed lodge, which M/s Kamal Alloys Limited intends to construct and later on operate, is very relevant to this Act because fire sources could be from LPG, electric faults or wild fires that may propagate into the premises and cause havoc to the Company's property and employees. In view of the above, the developer is aware of this Act and therefore will initiate precaution measures in case of fire occurrence such as placing precaution notifications and fire extinguishers at strategic positions and constructing and maintaining a fire break by clearing grasses around the lodge compound. The proponent is also ready to cooperate once notice to fire abatement is served by the Commissioner responsible for fire and rescue services in case he becomes satisfied that there exists in any premises of the lodge any fire hazard.

3.3.19 Workers Compensation Act, No. 20 (2008)

This Act was enacted among other objectives to; (i) provide for adequate and equitable compensation for employees who suffer occupational injuries or contract occupational diseases arising out of, and in the course of their employment, and in the case of death, for their dependants; (ii) provide for the rehabilitation of employees who have suffered occupational diseases in order to assist in restoring their health, independence and participation in the society; and, (iii) promote the prevention of accidents and occupational diseases (URT, 2008a). Sections 19-32 of this Act stipulate that where an employee gets involved in an accident resulting to disablement or death, an employee or dependant of an employee shall, subject to the provisions of this Act be entitled to compensation provided under this Act (URT, 2008a). Since it is inevitable that employees in this project will either be involved in accidents, contract occupational diseases or may die during the life of the project implementation, this Act is relevant to the proposed facility with respect to raising awareness of the proponent toward handling such circumstances in case they occur. The Company shall also register itself with Occupational Safety and Health Authority (OSHA) and collaborate with it to provide awareness training to employees on regular basis.

3.4 International Conventions

3.4.1 East African Community Treaty (1999) amended in 2007.

The treaty establishing the East African Community (EAC) was signed by heads of partner states on November 30, 1999 in Arusha, Tanzania and came into force on July 7, 2000. The EAC was formally launched on January 15, 2001. Currently comprised of six Party States, which are, Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda, the broad goal of the Community is to enhance cooperation in all areas for mutual benefit of the Partner States. Among the EAC objectives is to promote a sustainable growth and equitable development of Partner States including rational utilization of the Region's natural resources and protection of the environment (<http://www.africa.union.org>, 2015). Wildlife, particularly migratory species of the Serengeti ecosystem is a shared resource between Kenya and Tanzania, which this treaty aims to conserve among others. The developer of the proposed Serengeti Belabela lodge is aware of the close relationship, which the project bears with this Treaty. This is the reason why M/s Kamal Alloys (Avika Hotels and Resorts Limited) is committed to implementing this undertaking in such a manner that, activities to be conducted within the lodge premises and surrounding environments will not compromise migratory wildlife species and their constituent habitats.

3.4.2 Lusaka Agreement (1994)

The Lusaka Agreement on cooperative enforcement of operations directed at illegal trade on wild fauna and flora is an intergovernmental organization with the main function of facilitating cooperation activities in and among Party States in carrying out investigations on violations of national laws pertaining to illegal trade in wild animals and vegetation. The Agreement was the brain-child of Wildlife Law Enforcement Officers from eight eastern and southern African countries, which met in Lusaka, Zambia in December 1992 under the auspices of Zambia's Ministry of Tourism. One year later, the development of this African initiative led to formal intergovernmental negotiations under the support of the United Nations Environmental Program (UNEP), which resulted in adopting this Agreement on 8th September, 1994. The Agreement came into force on 10th December 1996 with ratification or formal acceptance of four countries. Currently there are six Party States to the Agreement namely, Lesotho, Kenya, Tanzania, Uganda, Zambia and the Republic of Congo (Brazzaville). The Republic of South Africa, Ethiopia and the Kingdom of Swaziland are signatories.

The Agreement provides for setting up a permanent Task Force that would implement its objectives. Consequently, the Task Force was launched on 1st June, 1999 with its headquarters located in Nairobi, Kenya. The mission statement of Lusaka Agreement is to support Member States and Collaborating Partners in reducing and ultimately eliminating illegal trade in wild fauna and flora in Africa through:

- (i) Facilitation of cooperative activities in undertaking law enforcement operations;
- (ii) Investigation on violations of national wildlife laws;
- (iii) Dissemination and exchange of information on illegal trade activities; and,

(iv) Capacity building including promoting conservation awareness among stakeholders.

So long as there is abundant and diverse species of wild fauna on seasonal basis down the hills where the facility will be constructed and because there will be regular movement of visitors and workers to and from the Lodge, the developer is committed to ensuring that all activities, which will be conducted at and beyond the site shall abide to the provisions of the Lusaka Agreement. The Company is also committed to collaborating with SENAPA and other operators in the area to report any doubtful movements of unknown people within the project's area of operation to relevant authorities.

3.4.3 Convention on International Trade in Endangered Species (1973)

Some of the wild animals that traverse downhill the site where the proposed lodge will be constructed belong to the categories of endangered, threatened and vulnerable species according to the Convention on International Trade in Endangered Species of Flora and Fauna (CITES) of 1973. Some of those animals include the African elephant, the lion, the leopard, the cheetah and the wild dog (TANAPA, 2006; 2017). The African Cape buffalo is one of the wildlife species grouped in the lower risky category, which also wander in the vicinity of the proposed site. Other species of mammals, amphibians, reptiles, birds and plants listed in the Convention might also be present within the project area. In recognition of this Convention and the knowledge of the developer on the existence of those species within the proposed site and its immediate surroundings, M/s Kamal Alloys (Avika Hotels and Resorts Limited) will deploy its experienced tour drives/guides who apart from providing guiding services and ensuring safety of the Company's clients, will also be responsible to observing and reporting any illegal activities including movement of doubtful individuals within and in the vicinity of the lodge to relevant authorities. In addition to deploying a ranger on part time basis from SENAPA for guarding tourists and lodge workers from wildlife attacks, all the Company's tour drivers/guides to be recruited will be required to have minimum education on wildlife conservation, interpretation and animal behavior from conservation institutes. These will therefore be capable of protecting tourists from wildlife attacks, translating conservation laws and conventions into actions and making sure that park rules and regulations are complied with.

3.4.4 World Heritage Sites Convention (1972)

The World Heritage Sites Convention of 1972 is concerned with the protection of world's cultural and natural heritages. It was adopted by the UNESCO General Conference in Paris in 1972 and Tanzania signed it in 1987. Through this Convention, UNESCO encourages the identification, protection and preservation of cultural and natural heritages considered to be of outstanding value to humans. By agreeing to set aside such areas, State Parties agree to take necessary measures to preserve the resources for good of humankind in the world and also agree that all world heritage sites belong to all people of the globe irrespective of the territories on which they are located. M/s Kamal Alloys (Avika Hotels and Resorts Limited) recognizes that attributes, which qualified SENAPA to be one of the World Heritage Sites, are greatest mammal migration on earth, outstanding savanna scenery, complex and complete mammalian community, diversity of fauna and flora, rare, threatened and endangered species and large ecologically dynamic

self-sustaining ecosystem. With that recognition, the developer is committed to undertake activities at the proposed lodge during all phases of implementation in a manner that will minimize degradation of all the Outstanding Universal Values that enabled the park to be listed as a World Heritage Site.

3.4.5 Convention on Biological Diversity (1992)

Adopted at the Rio de Janeiro “Earth Summit” in June 1992, the Convention on Biological Diversity (CBD) recognizes that biological diversity is not only about plants, animals and microorganisms and their ecosystems, but it includes people and their need for food, security, medicines, fresh air, safe water, shelter and clean and healthy environment in which they live. The Convention is geared towards addressing the fragmentation, degradation and upright loss of forests and other habitats, all of which representing much larger threat to biodiversity. It aims at developing national strategies for the conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the utilization of genetic resources (<http://www.cbd.int.org/cbd>, 2015). To achieve the above, Article 14 puts emphasis on the need for carrying out EIA on all projects that are likely to have significant adverse effects on biological diversity with a view to minimizing such effects. Because the developer is informed about the Convention’s dedication to promoting sustainable development and to becoming a practical tool for translating principles of Agenda 21 into reality, M/s Kamal Alloys (Avika Hotels and Resorts Limited) is committed to conserving the biological environment including rare, threatened and endangered species of the area and also the ecologically sensitive sites, the reason why this EIA was commissioned.

3.4.6 Convention on Climate Change (1992)

Adopted in May 1992, the Convention on Climate Change (CCC) sets an overall framework for intergovernmental efforts to tackle the challenges posed by climate change. It recognizes that the climate system is a shared resource globally whose stability can be affected by emissions of gases such as carbon dioxide and carbon monoxide produced from various development projects (<http://unfccc.int>, 2015). Deforestation is often attributed to climate change among other factors in less developed countries including Tanzania. The fact that major activities to be undertaken at the proposed lodge site will not involve the production of green-house gases and because conservation of forests, which contributes to carbon absorption is one of the major functions of the park, this project aligns well with the CCC, which advocates for the reduction of global warming gas emitted through human activities.

3.4.7 International Code of Conduct on the Distribution and Use of Pesticides

The International Code of Conduct on the Distribution and Use of Pesticides was one of the first voluntary Codes of Conduct in support of increased food security while protecting human health and environment under the framework of the Food and Agriculture Organization (FAO). The Code represents an up-to-date standard for pesticide management that embodies a modern approach leading to sound management of

pesticides, which focuses on risk reduction, and protection of human and environmental health. While Article 1.7.3 promotes practices, which reduce risks in the handling of pesticides including minimizing adverse effects on humans and the environment, and preventing accidental poisoning resulting from improper handling, Article 5.3.4 directs for the protection of biodiversity and minimization of adverse effects of pesticides on the environment including water, soil and air and on non-target organisms (www.fao.org, visited in November, 2015). In recognition of this Code of Conduct only approved pesticides for controlling nuisance creatures to humans such as mosquitoes and ants will be used at the proposed Serengeti-Belabela lodge. Should the need for using toxic chemicals within the proposed premises arises, for example, the need to fumigate so as to get rid of vectors and other human parasitic insects for the comfort of visitors, the services of a professional firm will be hired. Nonetheless, fumigation will be done when the lodge is occupied by few people preferably during off tourist seasons.

3.4.8 International Plant Protection Convention (1952)

The purpose of the International Plant Protection Convention (IPPC) is to secure common and effective action of preventing the introduction and spread of pests of plants and plant products, and to promote appropriate measures for their control. The implementation of the Convention has been applied mainly to crops, but it also extends to the protection of natural flora. Thus, the scope of the IPPC covers any invasive alien species that may be considered to be a plant pest. Since various construction materials and food supplies will come from outside the Park, if care will not be taken may result into the introduction of invasive plant species. To comply with this Convention, the developer plans to institute close screening schemes prior to importing building materials and foodstuffs into the Park. Introduction of exotic ornamental species will also be seriously prohibited and in cooperation with SENAPA all exotic plant species within the proposed site will be identified and removed so as to prevent interference of growth patterns of indigenous species.

3.4.9 International Labor Organization Convention (1991)

The Convention provides that Governments shall have the responsibility of developing, with the participation of people concerned, systematic action to protect the rights of local people and to guarantee for their integrity (<http://www.ilo.org>, 2015). Article 13 of the Convention directs governments to respect cultures and spiritual values of those people and their relationship with lands or territories or both as applicable, which they occupy or otherwise use. Land in this Convention includes the concept of territories, which cover the total environment of the area the people concerned occupy, or otherwise use. Article 15 deals with the rights of local people to the natural resources pertaining to their lands including the right to participate in the use, management and conservation of resources. Article 20 directs governments within the framework of national laws and regulations and in co-operation with the people concerned, to adopt special measures and ensure effective protection with regard to recruitment and conditions of employment of workers belonging to those people (<http://www.ilo.org>, 2015). Although the proposed project will be located in the national park where habitation by local communities is not allowed, those in close proximity and who will suffer mostly from negative impacts from the proposed project will be given priority when employment opportunities.

3.4.10 Occupational Safety and Health Convention (1983)

Entered into force on August 11, 1983 in Geneva, this Convention applies to all workers in the branches of economic activities. It provides that each Member State shall, in the light of national conditions and practices and in consultation with the most representative organizations of employers and workers, formulate, implement and periodically review a coherent national policy on occupational safety, health and the working environment. The aim of this Convention is to prevent accidents and injuries linked to, or occurring in the course of work and minimize as so far as is reasonably practicable, the causes of hazards inherent in the working environment. In view of this, Tanzania enacted an Occupational Safety and Health Act in 2003 (URT, 2003c), which the developer is committed to comply with, particularly by collaborating with OSHA, which will be invited to visit the lodge on annual basis to conduct training to employees and make follow up on the safe and healthy environment of both the staffs and clients.

3.5 Project Administrative Framework

The institutional arrangement for environmental management in Tanzania as provided in EMA (URT, 2004) spells out seven (7) institutions including the Minister responsible for environment who is the overall in-charge of administration for all matters related to the environment. Apart from the Minister, other legal institutions for environmental management in the country as spelt out in EMA, 2004 are:

- The National Environmental Advisory Committee;
- The Director of Environment;
- National Environment Management Council;
- The Sector Ministries;
- The Regional Secretariat; and,
- The Local Government Authorities including Cities, Municipals, Districts, Townships, Wards, Villages, and Mitaa.

Administratively, the proposed Serengeti-Belabela Lodge will be constructed within SENAPA, Serengeti District in Mara Region. This means that while the headquarters of the Company and most of the top Management members will work from Dar-es-Salaam City, day to day activities of the facility will be overseen by the Lodge Manager who will be stationed in SENAPA. Major functions of the Lodge Manager will be to ensure smooth running of the facility including efficient transportation of tourists within the park and surrounding environments, provision of high class accommodation facilities including meals and proper functioning of the lodge utilities. The Manager will also be responsible for ensuring that the environment is conserved to its optimal integrity and the welfare of employees complies with the National Health Policy of 1990 and the National Employment Policy of 1997. The Lodge Manager will be assisted by two Assistants; one responsible for Administration, Human Resources and Accounting matters and the other will manage the Food and Beverages Department. Other staffs at the lodge will include cooks, waiters, barmen, housekeepers, security guards, drivers and cleaners. Fifty per cent of the 80 staffs to be employed at the lodge will work under the permanent and pensionable terms and the other half will work on contract basis. While some few tour

drivers/guides to be employed by the Lodge will be stationed permanently at the site for conducting night game drives, attend on emergency cases and receive and send back visitors who will fly to nearby airstrips, majority will overnight at the lodge when accompanying visitors. SENAPA in particular and TANAPA in general, which is legally established by the National Parks Act No. 282, R.E of 2002 (URT, 2002) will bear great responsibility to enforcing compliance of the project within operating policies and legislation context.

Institutionally, Serengeti District Council bears some responsibility to the project because the project location falls in its area of administrative jurisdiction. So long as the project activities will be conducted in Mara Region, the project has also a wide range of significance to the Regional Secretariat. In addition, apart from the MNRT in which this undertaking directly falls, the project is also relevant to the Vice President's Office, where the Minister and the Director responsible for environment area placed. Other relevant ministries are the Water Development and Irrigation particularly the Victoria Water Basin Office and the Finance and Economic Affairs particularly to issues related to tax payment compliance.

The major relevant government institutions to this project besides TANAPA are OSHA and NEMC. While OSHA is charged to oversee issues related to human safety and health, NEMC has legal mandate of overseeing environmental compliance, and together with The National Environmental Advisory Committee, the Council is responsible for advising the Minister responsible for environment on EIA and EA reports who in turn gives final decision on whether an environmental clearance certificate should be granted. Not issued or revoked. Key international organizations to the project are the EAC and UNESCO. While one of the EAC objectives is to promote sustainable growth and equitable development of Partner States including rational utilization of the region's natural resources and protection of the environment, UNESCO is an international organization, which oversees the performance of the World Heritage Sites, which SENAPA belongs to.

4.0 DESCRIPTION OF THE EXISTING CONDITION

4.1 Climate

The proposed site is featured by two distinct climatic conditions namely dry and wet seasons. Whereas the dry periods are marked between June and September and between January and February, the wet season is featured by short showers, which pour between October and December and long rains between March and May. The average rainfall ranges between 500 and 800mm per year and potential evaporation is between 2160 – 2600 (RockTech Group, 2016). The temperature depends on rainfall patterns but its average during the day varies between 24^{0c} and 29^{0c} and normally below 24^{0c} at night (TANAPA, 2006).

4.2 Geology and Drainage

The proposed site is composed of Nyanzian and Kavirondian geological system, characterized by rock-types including folded banded ironstone, quartzite, sandstones and shale. Fragments of these outcrops, which have formed boulders, pebbles, cobbles, coarse sand and gravel, which are mostly found on slopes of the hills, are favorable for ground water storage and movement. The site is recharged by the surrounding mountains and a seasonal stream which flows from the south east to north east direction. The mountain crust and fragmented rocks on the sloping land cause high infiltration rate of atmospheric precipitation into the ground. Accumulation of groundwater under the water table, which is confined in aquifers, is enhanced by a relatively flat terrain down the hills. (RockTech Group, 2016).

4.3 Biological Resources

SENEPA is endowed with exceptional biological resources including large mammal migration, high flora and fauna biodiversity within pristine wilderness areas and vast open savannah plains with large predator-prey populations that attract tourists and revenue to the Government and neighboring communities.

4.3.1 Flora

Type of vegetation at the site where the proposed Serengeti-Belabela Lodge will be constructed was identified during site visits and complemented with information available in the 2006-2016 SENAPA GMP (TANAPA, 2006). The site supports wooded-grasslands type of vegetation (Figure 5) dominated by the Gum arabic *Acacia Senegal*, Wait-a-bit thorn *A.melifera*, Large stink-bark *A.clavigera* and Spindy gall-forming whistling *A.drepanolobium* tree species alongside other notable species including *Combretum* and *Comiphora*. Also sparsely found within the site are Amarula tree species and the Rock fig *Ficus lutea* species. The woody and shrub vegetation are interspersed with Thatching grass *Hypharrhenia rufa*, Couch grass *Cynodon dactylon*, Rhodes grass *Chloris gayana*, Spiky Grass *Sporobolus spicatus*, Wild morning glory *Ipomoea jaegeri*, Oats grass *Themeda triandra*, *Panicum minimum* and *Digitaria macroblephane*.



Figure 5 Wooded-grassland type of vegetation at proposed Serengeti-Belabela site in SENAPA
Source: Photo taken during the site visit, February (2017)

4.3.2 Fauna

According to SENAPA GMP of 2006-2016 (TANAPA, 2006) and environmental experts' knowledge, SENAPA supports not only the largest herds of migratory ungulates but also contains one of the highest concentrations of large predators in the world. Migratory wildlife species depending on rainfall timing normally utilize the low lying areas with the vicinity of the site where the proposed lodge will be established in May (Figure 6). The migratory populations, which traverse the Serengeti ecosystem including the Mara River crossing from SENAPA to Masai-Mara National Reserve in Kenya and vice versa are estimated to be 1.3 million wildebeest *Connochaetes taurinus*, 200,000 zebra *Eguus burchelli* and 440,000 Thomson gazelle *Gazella rufifrons thonsoni* (Sinclair et al. 2008). In addition to long distance migrants, Mbalageti and Grumeti rivers, which are located about 35km to the south on the hindmost side of Msabi Hills and 25km to the north respectively of the proposed site (Figure 1), attract resident wildlife including the topi, impala, Grants gazelle, dikdik, elephant, buffalo, warthog, waterbuck and giraffe. The baboon *Papio anubis* and velvet monkeys as well as the predators including the leopard *Panthera pardus*, lions *Panthera leo*, striped hyena *Crocota crocuta*, and jackals prowl around the prey under the inquisitive look of eagles and vultures. Approximately 607 bird species have been recorded in the whole of SENAPA (Sinclair et al. 2008). Documentation of other fauna species including small mammals, amphibians and reptiles is less advanced.



Figure 6: Annual movement of migratory wildlife species in Serengeti-Mara ecosystem

Source: (www.naturalhighsafaris.com., visited on 16th March, 2017).

4.4 Waste Management

Current practice of solid waste management undertaken by accommodation operators in SENAPA is sorting according to their type and keeping the same in separate containers before they are disposed off mostly outside the Park. Wet waste, which are organic in nature like vegetable and other food remains are buried in deep holes covered with wire mesh and left to decompose. Combustible waste including papers and cardboards are blazed on site in safe drums. Non decomposable waste, which are comprised of plastic and glass bottles, plastic packaging materials and metal cans are stored at the sites and later on transported to Arusha City where it is sold to traders involved in recyclable activity. Operators who are located to the northern part of the park dispose non-decomposable waste at the dump site situated in the outskirts of Mugumu Township, which is owned by Serengeti District Council. Both dumping sites at Mugumu and Arusha city at Mkonoo area in Muriet Ward are not well managed (Figures 7 and 8). Hazardous waste mostly consisting of empty containers previously keeping insecticides, batteries and worn out bulbs are stored separately according to waste types in big plastic bags then kept at the site in covered synthetic drums before they are transported to Arusha city for dumping or recycling.



Figure 7: Dumping site in the outskirts of Mugumu Township

Source: Riedijk (2010).

Both the Arusha city and Mugumu outskirts dumping areas, which are potential dumping areas for waste generated in SENAPA remain to be an issue of major concern particularly taking into consideration the rapid human population growth in both localities and surrounding areas.



Figure 8: Dumping site at Mkonoo area in the city of Arusha

Source: Runyoro (2014).

5.0 STAKEHOLDERS' CONCERNS AND RESPONSES BY THE DEVELOPER

Section 89 of EMA (URT, 2004) provides a directive on public participation issues and its importance to the EIA process. Regulation 17(1) of the EIA and Audit Regulations (URT, 2005) provides details and procedures for stakeholders' participation in EIA process.

Section 89 of EMA (URT, 2004) provides directives on public participation issues and its importance to the EIA study process. Regulation 17 of the EIA and Audit Regulations (URT, 2005) provides detailed procedures for stakeholders' participation in EIA process. In this perspective, stakeholder is given a broad definition and includes all those people and institutions with interest in the successful design, implementation and sustainability of the project. The people who may either benefit or be affected by the project area are also considered to be stakeholders. Whereas concerns and views of individuals who were consulted during this EIA study and the developer's response are summarized in Table 7, written opinion from UNESCO are attached (Appendix 10) and names, institutions and signatures of individuals who were contacted are shown in Appendix 11.

Table 7 Summary of stakeholders' concerns and the developer's responses

S/N	Name	Designation	Institution	CONCERN/OPINION	DEVELOPER'S RESPONSE
1.	William Mwakilema	Chief Park Warden	Serengeti National Park	(i) Poaching is one of the major challenges facing SENAPA. This illegal activity is severe in remote areas where human movement is minimal. Poaching in most cases goes alongside with fights between poachers and park rangers, a situation which threatens security of tourists, researchers and other people residing inside the park and surrounding areas. Locating the facility to the proposed site aimed at among other factors to guarantee regular movement of people in this remote area so as to increase park security. (ii) Some people may enter into the Park in pretence of seeking jobs particularly during construction phase who may eventually turn to be poachers and bandits. Recruitment of employees at the construction site and operation of the lodge should therefore be done in collaboration with SENAPA Management and Village Councils.	(i) In addition to providing tourist services to the facility's clients, the developer will employ guards/tour guides with training from wildlife management institutions such as Pasiansi Wildlife College who will collaborate with SENAPA rangers to curb poaching. Recruitment of employees from the community shall be done in consultation with SENAPA and respective Village Authorities. (ii) The developer shall cooperate with other conservation, security and tourism stakeholders in the area including Serengeti District Council, TANAPA, the Wildlife Division, the Police Force and the local people to devise effective mechanism for combating poaching and banditry.
2.	Aldo Mduge	Tourism Officer	Serengeti National Park	Implementation of the proposed development should conform to policies, laws, regulations and international conventions and agreements.	(i) TANAPA Board of Trustees and the Management were fully involved in the process of granting an offer to the developer to invest in the construction and operation of the proposed lodge and all laid down procedures were adhered to pursuant to the National Policies for Tanzania National Parks, DALP, and SENAPA GMP. (ii) To effect the Board's decision TANAPA's Director General signed a letter of offer and approval to the clients request to increase the number of rooms (Appendices 2 and 3). (iii) The proposed project aligns well with government policies, which encourage private investors to partner with the government to provide high-class accommodation facilities to tourists visiting the country and those which exist to ensure among other issues, compatibility of development projects with sound environmental conservation and

					sustainable tourism promotion. (iv) The proposed project fits well with the National Development Vision 2025 and the NSGPR as endeavours to encourage the optimal use of land resource by enhancing the social and economic development through employment and provision of other income generating opportunities thus contributing to the war against poverty among local people particularly those residing in villages, which are closer to SENAPA. (v) The developer will pay tax to the Central Government and various fees to Serengeti District Council. TANAPA will also be paid concession fee for each visitor who will be accommodated at the lodge and entry fee into the park.
3.	Albert Mziray	Senior Park Ecologist	Tanzania National Parks	(i) SENAPA's GMP of 2006-2016 and the 2017 draft GMP, which is due for approval by the Board of Trustees designates the site where proposed lodge will be constructed as the "High Use Zone". (ii) According to SENAPA-GMP draft of 2017 there are currently 2,074 visitor beds in SENAPA against 3,728, which are needed to cater for ever increasing tourists in the Park. Only 764 beds are currently available in lodge accommodation category against the needed 1,074. Whereas the draft SENAPA-GMP of 2017 allows 150 beds in the lodge category within the Msabi-Kirawira area, which falls within the "High Use Zone" no such facility currently exists. The proposed 80 beds will therefore reduce an existing gap both with the zone in particular and SENAPA in general.	(i) The proposed lodge will be an ecologically and environmentally-friendly facility, which is allowed for establishment in the "High Use Zone pursuant to both the 2006-2016 and the 2017 draft SENAPA GMP. (ii) Whereas the proposed development will provide high end tourist beds in the Serengeti ecosystem and reduce the existing gap created by progressive increase in tourist numbers, the architectural drawings, which were submitted to TANAPA for approval will blend with the natural environment and enhance visitors' enjoyment and satisfaction without compromising outstanding universal values of the park.

4.	Ogada Magati	Economist	Serengeti District Council	Substantial amount of both decomposable and non-decomposable solid waste during construction and operation of the lodge will be generated. Together with the waste that will be generated by the proposed lodge, the rubbish, which is currently produced by other operators in the park and surrounding areas not only affects the park and its immediate surroundings but also upsets other areas where the waste is dumped. The developer should therefore collaborate with other stakeholders to improve a dumping site located in the outskirts of Mugumu Township. By so doing the Council will also diversify its sources of income sources because fee will be charged for dumping at an improved site.	The developer will collaborate with other waste-generating stakeholders in the Serengeti ecosystem as well as the Serengeti District Council to improve a dumping site located in the vicinity of the Mugumu Township. However, since the dump is currently not well managed and saturated as shown in Figure 7, a licensed company to be hired will continue to transport waste to be generated by the proposed Lodge to Arusha most of it for recycling until when the dump site at Mugumu will be improved.
5.	Prisca Mwita	District Environmental Officer	Serengeti District Council	(i) Energy sources such as wood and fossil fuels, which are known to produce high level of pollutants, should be avoided in order to keep the environment as clean as possible. (ii) The developer should ensure that building materials to be used and technological design blend the lodge structures with the environment in order to preserve the site's scenic beauty. (iii) Excessive cutting of trees and vegetation clearance particularly during construction should be avoided as they may accelerate water run-off and consequently cause soil erosion.	(i) Solar power will be the major source of energy for lighting and running water heaters, fridges and freezers while LPG, which is relatively the cleanest source of energy to the environment when compared to oil, coal and wood fuel will be used for cooking. Diesel will only be used to operate water pumping and a backup generator. The sludge shall be converted to biogas to make the wastewater treatment plant self-sufficient with energy. (ii) Building materials will mostly be natural such as stones and thatch grass and the architectural drawings provide for structural designs and paints that will blend lodge buildings with the environment. While most of the structures will be buffered by trees, outdoor lights shall be down-casted to reduce direct luminosity. (iii) Unnecessary clearance of trees shall be avoided. Most of the earth work like construction of foundations shall be conducted during dry season to avoid runoff on bare grounds. Re-planting of indigenous trees to the area shall be conducted after construction has been completed and landscaping done.

6.	John Lendoyani	District Game Officer	Serengeti District Council	(i) There exists a risk of introducing alien plant species through importation of building materials during construction as well as through supply of foodstuffs and introduction of ornamental plants. If not well screened, alien plants may interfere with growth patterns of indigenous plant species and ultimately weaken the ecological processes of the area. (ii) Concentration of developments and interference of wildlife migration routes may subsequently upset the natural living patterns of some wildlife species inside SENAPA and oblige them to emigrate from the Park into settled areas and cause conflict with humans. (iii) There is potential for speeding vehicles to knock down people and wildlife and cause injuries and sometimes deaths when involved in accidents particularly in areas with sharp corners.	(i) Intensive screening of construction materials and foodstuffs shall be conducted prior to importing them in the park. Introduction of ornamental plants shall strictly be prohibited. (ii) The proposed site is located at an average of 1340 meters above sea level where Serengeti wildlife migratory species including wildebeest and zebra, which are plains' animals, do not traverse. Other animal species, which venture the site intermittently, such as elephants may not be harassed because visitors and employees will not be allowed to walk beyond lodge premises. Construction activities shall take place during day time leaving wildlife free during the night when many species are active. (iii) Animal road kills will be contained through the construction of an accessible track to the facility with bumps to contain speeding. Awareness on the danger of over-speeding shall be raised to drivers and those found driving beyond limits shall be penalized.
7.	Wambura Sunday	District Community Development Officer	Serengeti District Council	(i) Priority for employment should be given to people from neighbouring communities both during construction and operation phases. (ii) Building materials and foodstuffs should be purchased locally from neighbouring villages and the districts. (iii) There is potential of disease transmission particularly HIV/AIDS to communities neighboring the proposed development. HIV/AIDS incidences are reported to be high in many areas where newcomers mingle with residents. Diseases like upper respiratory system infection may also occur in areas where people are congested such as at construction sites.	(i) The developer plans to employ at least 60% of non-skilled workers from neighboring communities both during construction and operation phases. Should they have required qualification majority of skilled employees shall also be recruited from the local community (ii) The lodge shall provide avenue for income generating activities to neighboring communities including the selling of foodstuffs to the lodge, handicraft to tourist and train members of the community to serve as interpreters when visitors pay visit to villages outside the park. The developer will also organize regular traditional dances at the lodge. Also building materials such as sand and stones will be purchased from Lamadi and Robanda villages in Bunda and Serengeti Districts respectively. (iii) Awareness on the negative impact of sexually-transmitted diseases especially HIV/AIDS shall be

					given to indigenous residents, construction personnel as well as lodge staffs Protective gear particularly condoms shall be provided at the construction camp and the lodge during operation. Sufficient tents shall be provided for workers during construction phase to avoid congestion.
8.	Josephat Msimbano	Senior Tourism Officer	Ministry of Natural Resources and Tourism	(i) High noise and vibration levels particularly, generated by vehicles, generators and construction equipment if not controlled may, cause psychological and health problems to humans ranging from annoyance to heart diseases as well as disrupt wildlife behavior patterns. (ii) Excessive dust in the ambient air may also cause adverse effects on human health and the biodiversity including wildlife and plants. (iii) Care should be taken to control accidents from construction equipment, which may sometimes be fatal.	(i) Modern machinery and vehicles that generate low noise and vibration shall be used. A low-noise making and pollutant-free backup generator shall be housed in a sound-proof room (ii) Water sprinkling on cleared areas shall be conducted particularly during dry season to reduce dust. (iii) The contractor shall provide and enforce the use personal protective gear during construction. A first aid kit with trained personnel to attend on accidents shall be availed and a vehicle shall be stationed full time at the site to transport casualties for referral cases.
9.	Kay Kagaruki	For: Permanent Secretary	Ministry of Natural Resources and Tourism	(i) TANAPA, which is the government organization and entrusted to manage national parks in Tanzania, should give advice on how the proposed lodge should be designed and where it should be located. (ii) Comments from the Department of Wildlife of the Ministry of Natural Resources and Tourism shall be given after a draft EIS has been prepared.	(i) TANAPA Board of Trustees and the Management were fully involved in the process of selecting and granting an offer. According to TANAPA's DALP, the lease negotiations will take place only after the Board of Trustees has approved the Project Proposal In addition to the standard terms of the Lease Agreement, the lease will include all mitigation stipulations and other conditions or requirements of the technical review and the EIS. (ii) Representative of the Director of Wildlife was one of the members of the Technical Advisory Committee, which visited the site and commented on the draft EIS.
10.	Deogratias Mdamu	For: Permanent Secretary	Ministry of Natural Resources and Tourism	Normally the Tanzania Tourism Business License is issued by the Ministry of Natural Resources and Tourism to a company, which is ready to operate after all other requirements including EIA certificate have	NEMC has adhered to the Ministry's advice such that EIA study procedure has progressed and the developer will commence the process of acquiring the Tourism Business License after construction has

				been fulfilled. NEMC was therefore advised by the Ministry to allow M/s Kamal Alloys Limited to continue with EIA study process and be granted a license once it is ready to operate.	been completed.
11.	Mechtild Rossier	Director, World Heritage Centre	UNESCO on behalf of IUCN	(i) Comprehensive EIA should be conducted in line with the IUCN World Heritage Advice Note on Environmental Assessment indicating but not limited to the potential and severity of negative impacts the project may have on the Outstanding Universal Value of SENAPA and mitigation options. (ii) EIA report should be submitted to the World Heritage Centre for review by IUCN before any irreversible activities are undertaken. (iii) In case there was a recent management plan IUCN was to contact the national authorities in order to clarify how the proposed project relates to the area's current strategy for tourism management. (iv) The proposed location looks to be overlapping with, or close to wildebeest migratory route and therefore an alternative location should be considered. (v) The 2006-2016 SENAPA-GMP stipulates that only permanent tented camps will be permitted in the "Low Use Zone". It therefore appears that the proposed lodge is incompatible with the GMP and therefore the project design should be modified or the project relocated (vi) A hydrological survey should be conducted before a borehole drilling, which should among other things determine the natural volume of underground flow from nearby rivers and model the potential impact on water resource availability under the current project design. (vii) Scarce water supply for wildlife during dry years, and consider that any activity that may exacerbate the situation be examined carefully (viii) The State party should review the overall capacity of the property for overnight and day tourists to ensure the overall Outstanding Universal Values of the Property are maintained.	(i) The EIA study was conducted in line with the Tanzania's EIA and Audit Regulations, 2005, which require the identification of potential and severity of impacts and their mitigation measures/actions as the IUCN World Heritage Advice Note on Environmental Assessment insist on. (ii) The project brief for construction of the proposed Serengeti-Belabela Lodge was submitted and reviewed by IUCN and all concerns and opinions, which were pointed out were examined carefully during EIA study taken on board. (iii) Hard and electronic copies of the final EIS have been submitted to TANAPA; a Government-owned Organization, which is mandated to forward the same to IUCN together with an operating GMP for review before TANAPA signs a lease agreement with the developer. (iv) The proposed site is located at an average altitude of 1,340 meters above sea level where migratory plains/savanna game including wildebeest and zebra do not traverse/cross. (v) The proposed site is in the remote area designated as "High Use Zone" by both the 2006-2016 and draft 2017 SENAPA GMPs, where development of environmentally friendly permanent tented camps and lodges are allowed. (vi) A survey on water, which was conducted, was preliminary involving the hydro-ecological and geological studies. The report recommends for drilling to be supervised by a Hydrologist who should drill a pilot hole before reaming for undertaking chemical analysis and other important parameters from the aquifers

					(vii) Water-serving appliances have been considered in the architectural design and wastewater treatment plant has been proposed for water recycling to be used in non-human consumption thus reducing water utilization from a borehole. (viii) The review on overall capacity of the property for overnight and day tourists has already been conducted and is contained in the 2017 draft GMP, which is due for approval by the Board of Trustees.
12.	Dr. Victor Kakengi	Principal Research Officer	Tanzania Wildlife Research Institute	Oil spillage from construction vehicles and other equipments if not controlled may contaminate the soil, drain into surface water through run-off and percolate into ground water. Oil even at low level concentration is noticeable and toxic for majority of life forms including humans, plants and animals and its effect is immediate and destroying. It is therefore advised that oil spills should be controlled.	Regular inspection of construction vehicles and other equipment shall be done in order to control accidental oil spillage and leakages. A pathway on screed cement surface to the collection point to drain oil spills shall be provided at the workshop. Used oil shall be stored in drums then donated to local people to treat construction woods
13.	Francis Mollel	Sales Manager	Serena Lodges	Sewage if not properly disposed off may contaminate the soil and later on pollute both surface and underground water. Inappropriate disposal of sewage may become eyesore, pollute the environment, harm wildlife and create suitable breeding environment for disease vectors.	Sewage shall pass through 100mm PVC pipes to regularly inspected treatment plant where wastewater shall be recycled for non-human consumption utilization. Sludge shall be processed to produce biogas and remaining portion dewatered and dried for use as manure by local farmers outside the park.

6.0 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF ALTERNATIVES

Potential impacts during all phases of the project implementation were determined basing on concerns as well as opinions, which were raised by stakeholders. These were complemented by site visits, which were undertaken to determine baseline information on the biophysical and social attributes. Decision on the magnitude of an impact that was identified depended on experts' judgment, information from literature and experience from similar projects elsewhere. Significance of impacts was rated according to their likelihood of occurrence, magnitude, value of the affected environment, likely degree of an affected environment to recover and level of stakeholders' concerns. The rating provided basis for the determination of noteworthy impacts (Table 8), which need mitigation measures for negative impacts and enhancement actions for the positive ones.

However, before embarking on the identification of project's impacts, the boundaries considered to be affected were defined. Determination of boundaries during EIA studies is a stage of great importance in the identification of impacts and the establishment of levels to which the impacts will be experienced. Three types of boundaries, which were considered in this EIA, are institutional, temporal and spatial.

6.1 Project Boundaries

6.1.1 Institutional

Institutional boundaries refer to those institutions within which the project interacts. These are determined by administrative structures, mandates, policies, laws and regulations. The proposed project touches interests of many institutions and administrative units both in Tanzania and outside the country. The major international organizations are the EAC and UNESCO/IUCN. While one of the EAC objectives is to promote a sustainable growth and equitable development of Partner States including rational utilization of the region's natural resources and protection of the environment, the relevance of UNESCO to this project lies in the sense that, SENAPA, where the proposed development is to be undertaken is inscribed on UNESCO's World Heritage Sites List. Ministries in Tanzania with relevance to the proposed project are the Natural Resources and Tourism, Vice President's Office (Environment), Water Development and Irrigation, Finance and Economic Affairs and President's Office particularly the Local Government and Regional Administration. The key non-governmental stakeholders are Tanzania Association of Hoteliers (TAH) and OSHA. During the conduction of this EIA study, representatives from the above listed institutions were either contacted or their guidelines and operating policies were reviewed.

6.1.2 Temporal

Temporal boundaries refer to the lifespan and reversibility of impacts. When conducting this EIA such boundaries were categorized into two areas. One class referred to those activities, which cease to be impacts when a certain phase of implementation has been completed or referred to as short-term impacts. The other type considered those, which stretch far into the future until decommissioning takes place and beyond the closure of the project referred to as long-term impacts. In view of that, it was imperative to define temporal boundaries with reference to the duration of the impact in question. This kind of a boundary took in account the consequences of the project starting with pre-construction

activities until the undertaking comes to an end, including construction, operation and decommissioning phases.

6.1.3 Spatial

Spatial boundaries are difficult to determine with precision but are important to helping decide whether impacts are likely to occur at local, national, regional or international levels. The establishment of the proposed Serengeti-Belabela Lodge may have wide ranging implications that could be felt locally, regionally or globally, thus causing impacts at the site as well as far away from where the facility will be constructed. On one hand, the proposed project will, for example, create employment opportunities and market prospects to surrounding communities for goods and services. On the other hand, decisions made far away from SENAPA, for example in Arusha where TANAPA headquarters is located and Dar-es-Salaam where the head office of M/s Kamal Alloys (Avika Hotels and Resorts Limited) is situated will influence the implementation of the project. When determining spatial boundary of any development project it is important to consider impacts in a form similar to a tangled web, starting with the most core impact area where the project is located and, which would bear direct impacts. In the case of the proposed facility, the core impact area is SENAPA. SENAPA will suffer relatively greater environmental costs particularly those related to waste generation and resources utilization such as water but will benefit relatively more than other institutions in terms of revenue generation.

The core impact area is surrounded by an immediate impact area, which is situated outside the former but plays an important role or bears some of the impacts. The immediate impact area in the case of the proposed project will be the rest of Serengeti District particularly the villages, which are closer to the facility. The presence of the proposed Serengeti-Belabela Lodge will create employment and other income generating opportunities such as supply of goods and services to the facility. There are might be negative impacts to surrounding communities such as transmission of communicable diseases particularly HIV/AIDS, interference with traditional norms, impediment of water regimes and patterns as well as dumping waste in their backyards.

The more outer spatial dimension of the proposed project include Dar-es-Salaam and Dodoma; which are the country's major business centre and capital city respectively. Arusha city is also a major gateway for guests visiting northern Tanzania's tourist attractions as well as the headquarters of TANAPA and the EAC.

6.2 Potential Impacts of the Project

Both positive and negative impacts were identified for all phases of the project implementation. Significance rating of identified impacts is shown in Table 8.

6.2.1 Pre-construction phase

❖ Negative impacts

- Soil erosion resulting from vegetation clearance during construction of an accessible track;

- Injuries and sometimes deaths to people and wildlife by vehicles and construction other equipment;
- Risk to human attack by wild animals;
- Potential for poaching and criminal incidences due to increased human influx;
- Reduced soil cover by firewood collection for cooking and heating;
- Effect of noise to humans and wildlife by construction vehicles and other equipment;
- Effect of vibration to humans and wildlife by vehicles and other equipment;
- Introduction of invasive plant species through construction materials;
- Potential for transmission of zoonotic diseases; and,
- Soil and water pollution by oil spills.

6.2.2 Construction phase

❖ Positive impacts

- Provision of employment and subsequent contribution to war against poverty; and,
- Provision of other economic opportunities to the local community including opportunities for selling foodstuffs to the construction team and sale of local building materials.

❖ Negative impacts

- Potential for reduction in water availability to wildlife and the disruption of natural water regimes and patterns;
- Formation of gullies, soil erosion, increased runoff and sedimentation resulting from vegetation clearance;
- Effect of noise to animals by vehicles, construction equipment and construction crew;
- Effect of vibration to people and animals by vehicles and construction equipment;
- Effect of dust to people, animals and plants by vehicles;
- Human injuries and sometimes deaths by construction vehicles and equipment;
- Risk to human attack by wildlife;
- Effect of oil spills to the soil and water from vehicles and other equipment;
- Introduction of invasive plant species through the importation of construction materials and foodstuffs;
- Potential for increased transmission of HIV/AIDS and other communicable diseases;
- Interference with animals' dispersal areas and calving grounds;
- Wildlife disturbance and harassment by construction activities;
- Potential for poaching and criminal incidences due to increased human influx;
- Reduced soil cover by firewood collection for cooking and heating;
- Visual impacts emanating from using non-environment blending building materials;
- Potential for transmission of zoonotic diseases;
- Increased solid waste and the consequent creation of breeding sites for disease vectors;
- Air pollution by smoke and gases produced by vehicles and other equipments; and,
- Cumulative effects of solid and liquid waste both at the construction site and disposal areas.

6.2.3 Operation phase

❖ Positive impacts

- Provision of employment and its subsequent contribution to war against poverty;
- Provision of other economic opportunities to neighboring communities including selling foodstuffs to the lodge, souvenir to tourists and interpretation services when visitors pay visit to communities;
- Increased quality tourist beds in SENAPA and the resulting enhancement of visitor enjoyment and satisfaction; and,
- Increased revenue to TANAPA, Serengeti District Council and the Treasury.

❖ Negative impacts

- Reduced water availability to wildlife and potential for disruption of natural water regimes and patterns;
- Effect of noise to people and animals by vehicles, water pumping machine and a backup generator;
- Effect of vibration to humans and wildlife by tourist vehicles and a backup generator;
- Effect of dust to people, animals and plants by vehicles;
- Injuries and sometimes deaths to people and wildlife, which may be caused by speeding vehicles particularly on stretches with sharp corners;
- Introduction of invasive plant species through the importation of lodge supplies and introduction of ornamental plants;
- Diseases transmission particularly HIV/AIDS and other communicable diseases particularly from immigrant workers;
- Interference with wildlife dispersal areas and calving grounds;
- Visual impacts emanating from using non-environment blending building materials;
- Potential for poaching and criminal incidences due to increased human influx;
- Damage to the lodge property and immediate environment by wildfires that may be started by poachers or natural occurrence;
- Potential for human injuries and deaths by wildlife attack;
- Potential for transmission of zoonotic diseases;
- Contamination of soil and water both surface and underground by sewage;
- Contamination of soil and water both surface and underground by oil spills;
- Increased solid waste and the subsequent creation of breeding sites for disease vectors;
- Air pollution by smoke and gases produced by tourist vehicles, water pumping machine and a generator;
- Rise in the cost of living in nearby communities;
- Interference with traditional norms and customs due to increased income by immigrant workers and visitors in surrounding hamlets; and,
- Cumulative effect of solid and liquid as well as water utilization from additional accommodation facilities in SENAPA.

6.2.4 Decommissioning phase

❖ Positive impact

- Site restoration through vegetation recovery and re-planting indigenous trees;
- Reduced liquid and solid waste generation; and,
- Minimized water utilization in the park and surrounding areas.

❖ Negative impacts

- Reduced human movement hence increased chances of poaching incidences;
- Visual impact by rubble and subsequent air pollution by discarded building materials;
- Laying off employees and the resulting negative change in the life style of workers and their dependants;
- Loss of up-end tourist accommodation facility in SENAPA;
- Loss of other economic opportunities to local communities; and,
- Loss of revenue to TANAPA, Serengeti District Council and the Treasury.

Table 8: Summary of the identified potential impacts for the proposed Serengeti Belabela Lodge

ENVIRONMENTAL IMPACTS			IMPACT RATING BY PHASES			
		Impact status	Pre-construction	Construction	Operation	Decommissioning
	Positive Impacts					
Provision of employment and the subsequent contribution to war against poverty		Direct, high magnitude and long-term	0	+2	+3	-1
Provision of other economic opportunities to the local community		Indirect, low magnitude and long-term	0	+1	+2	-2
Increased quality tourist beds in SENAPA		Direct, high magnitude and long-term	0	0	+3	-3
Opportunity for increased revenue to TANAPA, Serengeti District Council and the Treasury		Direct, high magnitude and long-term	0	+1	+3	-3
	Negative Impacts					
Reduced availability of water and interruption of water regimes and patterns		Direct, high magnitude and long-term	0	-1	-2	+2
Injuries and sometimes deaths to people and wildlife caused by machineries and speeding vehicles		Direct, moderate magnitude and short-term	-1	-2	-1	+1
Potential for poaching and criminal incidences due to increased human influx		Direct, moderate magnitude and long-term	-1	-2	-2	-/+2
Formation of gullies, soil erosion, increased runoff and sedimentation resulting from vegetation clearance		Direct, high magnitude and short-term	-1	-2	-1	+2
Effect of noise to humans and wildlife		Direct, low magnitude and long-term	-1	-2	-1	+1
Effect of vibrations to humans and wildlife		Indirect, low magnitude and short-term	-1	-1	-1	0
Effect of dust to humans and wildlife		Direct, moderate magnitude and long-term	-1	-2	-1	+2

Interference with wildlife dispersal areas and calving grounds	Indirect, moderate magnitude and long-term	0	-2	-2	+2
Wildlife harassment	Indirect, low magnitude and long-term	-1	-1	-1	+1
Introduction of invasive plant species	Direct, high magnitude and long-term	-1	-2	-2	+2
Transmission of sexual diseases particularly HIV/AIDS	Direct, low magnitude and long-term	0	-2	-1	+1
Contamination of soil and water both surface and underground by sewage	Direct, high magnitude and long-term	-1	-1	-2	+1
Contamination of soil and water both surface and underground by oil spills	Direct, high magnitude and long-term	-1	-2	-2	+1
Generation of solid waste and the consequent creation of breeding sites for disease vectors	Direct, high magnitude and long-term	-1	-2	-2	+2
Reduced soil cover by firewood collection for cooking and heating	Indirect, low magnitude and short-term	-1	-1	0	0
Damage to camp properties by wildfires started by poachers or natural occurrence like lightening	Direct, low magnitude and long-term	0	0	-1	0
Air pollution by smoke and gases	Direct, high magnitude and long-term	-1	-1	-1	+1
Potential for transmission of zoonotic diseases	Indirect, low magnitude and short-term	-1	-1	-1	0
Potential for humans' attack by wildlife	Direct, low magnitude and long-term	-1	-1	-1	0
Rise in the cost of living due to influx of people	Indirect, low magnitude and long-term	0	0	-1	0
Change in traditional norms and customs	Direct, low magnitude and long-term	0	0	-1	+1
Visual impacts emanating from using non-environmental blending building materials	Direct, low magnitude and short-term	0	-1	-1	+1
Cumulative effect of solid and liquid resulting from additional accommodation facilities in SENAPA	Direct, high magnitude and long-term	0	0	-2	+2

Key: very high negative impact (-3), high negative impact (-2), minor negative impact (-1), no impact (0), minor positive impact (+1), high positive (+2) and very high positive impacts (+3).

Source: Environmental experts' assessment (2017)

6.3 Project Alternatives

In the process of conducting EIA study it is important to consider different alternatives, which may achieve more or less similar objectives of the proposed project. Consideration of the project alternatives is vital to ensuring that the developer and decision-makers have a broader base from which they can choose from the most suitable preference. When considering project alternatives it is also valuable to include a consideration of what would happen without the project, that is, the "no project option". Environmental, socio-economic and viability considerations are normally taken into account when assessing alternatives. Alternatives, which were considered and examined thoroughly during the

conduction of EIA study for the proposed Serengeti-Belabela Lodge were, the “no project”, size, design, location and technology.

6.3.1 No project alternative

The assumption that was considered in this alternative was that the proposed facility is not undertaken at all. This EIA study revealed that the government is encouraging private investors in the hospitality industry to construct and operate high quality tourist accommodation facilities in Tanzania and particularly in the Serengeti ecosystem so as to cater for increasing number of visitors. According to the 2017 draft GMP for SENAPA, TANAPA foreseen to have 3,728 beds in different types of accommodation facilities including lodges, permanent tented camps, premium sites, special camp sites, public sites as well as hostels and rest houses at one particular time against the existing 2,074 beds (TANAPA, 2017). TANAPA and the Government’s efforts to achieving this goal will therefore not be realized if the proposed project will not be implemented. The implementation of the proposed facility aligns well with many national guidelines and policies (see Chapter 3), which advocate for provision of high-class accommodation facilities to tourists, increasing foreign currency earnings to the Government and ultimately contributing to economic growth and reduction of poverty among Tanzanians without compromising environmental integrity. This EIA study revealed further that the proposed project aligns well with SENAPA-GMP, which shows that there is a gap of 310 beds in the lodge accommodation category within the “High Use Zone” in SENAPA (TANAPA, 2017). The establishment of the proposed facility will therefore have more advantages to realizing both the Government and TANAPA goals than if it will not be implemented.

6.3.2 Size alternative

The proposed development is a relatively larger eco-facility lodge seeking to offer a calm-bushy and exclusive environment. The alternative for the proposed project could be a relatively smaller permanent tented camp to accommodate fewer visitors. On one hand, construction time of a comparatively smaller accommodation facility will be shorter thus stretching impacts into short period of time, lesser water utilization and comparatively meagre waste generation both during construction and operation phases. However, on the other hand, notwithstanding that a bigger accommodation facility will require larger space to accommodate all the facilities, the impact on the environment will be concentrated on one area than would have been scattered all over the park in many smaller facilities. The bigger facility akin to the one, which is proposed, will therefore contribute towards filling a gap in tourist beds needed to accommodate the ever increasing tourist number in SENAPA.

6.3.3 Design alternative

Most of the materials to be used for the construction of the proposed lodge will be locally obtained in Tanzania including stones, sand, cement, thatch grass and corrugated iron sheets. Visitor rooms and the main building will be of the Banda type to be elevated slightly above the ground on treated wooden platform, supported by treated poles in concrete footings and sparsely scattered over a large piece of land (Figures 2 and 3). The Banda type of structures will not be visible from great distances or from vantage points

either inside or outside the park. Alternatively all structures could be housed in a single or multi-storey building, taking smaller land area but, which would be a sky scraper thus distracting prominent view of the Belabela Hills.

6.3.4 Location alternative

Although majority of the respondents acknowledged that the proposed facility is well located and planned to offer the most sought safari destination to foreign tourists, they argued that there should not be more accommodation facilities within SENAPA so as to reduce pressure on Outstanding Universal Values of the area. The more the visitors accommodated within SENAPA, the more waste generation and utilization of other natural resources such as water. Other people suggested that if the bush experience is the one being sought, the proposed lodge could be developed outside the park either in the neighboring Ikona Wildlife Area (WMA) or in the southern part of the country, which also contains unique tourist attractions. However, the eight sites available in Ikona as provided in the GMP for that WMA, were already developed (Runyoro, 2014). Further, TANAPA argued that accommodation developments in other parks in country were going on according to the Organization's investment prospectus (TANAPA, 2016). Further, there existed a gap of 310 beds in the lodge category within the "High Use Zone" compared to the number, which available in 2016 (TANAPA, 2017).

Some respondents from the District Council argued that if that facility could be constructed at Mugumu; the headquarter of the district, would have created a market that is otherwise non-existent and would generate a steady volume and reasonable returns from relatively well-off segment from within Tanzania wishing to be accommodated in urban centers in particular business people and conference as well as meeting attendees. Stakeholders felt that the local resident market will also patronize the venture as the facility will be operational almost throughout the year. However, the developer argued that basing on a market survey that was conducted prior to proposing the construction of Serengeti-Belabela Lodge in SENAPA revealed that the number of clients needing to spend nights in SENAPA has kept increasing over years. The same survey disclosed that if the facility was established outside SENAPA will fail to realize return on investment within 4-5 years as the pay-back period analysis indicated. Together with all positive and pertinent arguments that support the idea of constructing the facility at the proposed site, the existence of the lodge at the proposed site will assure regular movement of humans in the area and minimize poaching chances in this part of the park thus, the proposed location is comparatively better off than other location alternatives.

6.3.5 Technological alternative.

Technological alternative basically considered wastewater disposal systems. Option one, considered the installation of a wastewater treatment plant. The second option for wastewater disposal system was to direct the sewage into a soak away pit through an impermeable septic tank. The option was to disposal wastewater into an open area thus creating a man-made wetland. Whereas the soak away system was considered to be more feasible where soil type is sandy stone and therefore permeable to allow easy percolation of water into the ground and leaving behind solid matter in the pit, SENAPA management said that such a system which is currently used by many developers in

SENAPA was failing. In areas where the soil type containing a lot of pebbles, soak away pits were overflowing with a very short period of time. Man-made wetlands were not feasible inside parks where they make cause irreversible effect to the wildlife health and behaviour. The installation of a wastewater treatment plant was therefore considered advantageous than other system in the sense that recycled water will be used in non-consumption activities thus minimizing water utilization, it has prospects of producing biogas for use in the operation of a treatment plant thus reducing the use of fossil fuel as source of energy and the final dewatered, dry, without offensive odour and bacteria will be used as compost by neighbouring communities.

7.0 IMPACT MANAGEMENT OR ENVIRONMENTAL MITIGATION MEASURES

Recommended mitigation measures for negative impacts and enhancement actions for positive ones are for those impacts which were recognized to be significant during all phases of implementation as follows:

7.1 Pre-Construction and Construction Phases

7.1.1 Positive impacts

❖ Provision of employment and the subsequent contribution to war against poverty

➤ Enhancement actions

- Employment priority for unskilled as well as skilled personnel whenever available shall be given to people from neighboring villages;
- Employment shall consider gender but females will be given priority where they will have same as males;
- Employees shall be paid reasonable wages and the developer shall abide to all terms of employment as provided in operating policies;
- On job training particularly on saving and loan schemes shall be provided to workers to make them save money for future use when employment ends.

7.1.2 Negative impacts

❖ Injuries and deaths to people and wildlife by machineries and speeding vehicles

➤ Mitigation measures

- Construction workers shall be provided with protective gear including heavy boots, pair of overalls, helmets, hand gloves, eye shields, earmuffs and mouth covering devices to protect them from injuries. The use of protective gear shall be enforced;
- A first aid kit shall be provided at the construction site and a trained person to availing first aid shall be available;
- Bumps shall be placed at regular distances along the track going to the proposed site to control speed;
- Drivers shall be warned and penalized if found driving beyond speed limits both within and outside the park.

❖ Potential for poaching and banditry resulting from human influx

➤ Mitigation measures

- SENAPA and village leaders shall be involved in screening candidates seeking employment during construction;
- One copy of a photograph for construction personnel recruited from villages shall be kept by respective Village Councils, another kept at SENAPA office and a third copy kept by the developer at the construction site to easy follow up of workers' movements;
- A photograph of any employee resigning from employment shall be surrendered to nearby Police Station;
- All construction workers shall be given temporary identity cards and required to carry them all the time especially when they are out of the construction site;
- Mechanism shall be devised to ensure effective communication among all developers in the park. Communication between the developer and Police force as well as rangers

from SENAPA shall also be enhanced to make the Company participate fully in security issues;

- The developer shall deploy the assistance of a ranger from SENAPA who will be stationed at the construction camp or otherwise visit the camp regularly;
- Roll-calls for construction personnel shall be taken every morning before the work starts and tonight before they go to bed in order to control workers' movements.

❖ **Soil erosion from vegetation clearance**

➤ **Mitigation measures**

- Construction of foundations shall take place end of rainy season or during dry season;
- Vehicle movement shall be confined to designated tracks;
- Adequate open channels shall be provided to collect storm water;
- Vegetation clearance shall be limited to unavoidable circumstances.

❖ **Effect of noise to humans and wildlife**

➤ **Mitigation measures**

- Construction activities shall take place during the day so as to limit wildlife disturbance during the night when many species are active;
- Modern machinery and vehicles that generate low noise shall be used; and
- Construction crew shall be required to keep noise as low as possible when at the site.

❖ **Effect of dust to humans, wild animals and plants**

➤ **Mitigation measures**

- A bowser shall be provided to sprinkle cleared sites to reduce dust;
- Bumps shall be placed along a track going to the site to minimize dust generation by speeding vehicles; and,
- Masks shall be provided to the construction personnel to prevent them from dust effects.

❖ **Interference with wildlife dispersal areas**

➤ **Mitigation Measures**

- Most of the construction works shall be done during dry season when migratory animals are away from the neighboring areas;
- A construction camp shall not be fenced to allow free movement of animals;
- Construction people shall be prohibited to feed and harass animals; and,
- SENAPA shall be requested to station a game scout at the construction site to enforce park regulations.

❖ **Introduction of invasive plant species through building materials**

➤ **Mitigation measures**

- Collection of building materials from areas known to harbor alien plant species shall be avoided
- Intensive screening of building materials shall be conducted before transporting them to the site;
- Re-planting shall be done using indigenous plant species only, and,
- In cooperation with SENAPA all identified alien plants shall be removed.

❖ **Transmission of sexual diseases particularly HIV/AIDS**

➤ **Mitigation measures**

- Professionals from OSHA shall be invited to provide safety and health awareness training to workers putting more emphasis on communicable diseases in particular HIV/AIDS and other sexually transmitted diseases;
- Workers shall be encouraged to voluntarily test for HIV/AIDS;
- Condoms shall be provided at the construction site;
- Hygiene and cleanliness shall be emphasized;
- Enough tents shall be provided to avoid congestion.

❖ **Soil and water contamination by oil spills**

➤ **Mitigation measures**

- Regular inspection of construction vehicles and other equipment shall be done in order to control accidental oil spillage and leakages;
- A passageway on screed cement surface shall be provided at the workshop to drain oil into the collection point;
- Used/spilled oil shall be stored in drums and later on donated to local people to treat construction woods.

❖ **Creation of breeding sites for disease vectors by solid waste**

➤ **Mitigation measures**

- Containers for collecting different types of solid waste shall be placed at the site and sorting done immediately after rubbish has been produced;
- Non-decomposable waste shall be transported by a contracted and registered company to Arusha city and sold to traders dealing with recyclables; and,

7.2 Operation Phase

7.2.1 Positive impacts

❖ **Provision of employment and its subsequent contribution to war against poverty**

➤ **Enhancement actions**

- Villagers neighboring the proposed site shall be given priority in employment;
- Village Game Scouts shall be considered for employment particularly as guards and guides during short walks;
- Employment shall consider gender but females will be given priority where their qualifications will be the same as that of males;
- Workers shall be paid reasonable wages as stipulated in the Employment Policy and the Employment and Labour Relations Act;
- Staffs performing at highest level of compliance shall be rewarded; and,
- Training on saving and loan schemes shall be provided to workers.

❖ **Availability of other income generating activities to local people**

➤ **Enhancement actions**

- People from the local community shall be encouraged to produce quality farm products for lodge supplies and souvenirs for sale to visitors;
- Training shall be provided to the local community to provide interpretative services; and,

- Other essentials for the operation of the lodge such as equipment for sanitary shall be purchased from business people in Mugumu and Bunda townships.

❖ **Added tourist beds in SENAPA**

➤ **Enhancement action**

- Collaboration with other stakeholders including TANAPA and particularly SENEPA Management to ensure to provide high standard services.

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❖ **Increased revenue to TANAPA, Serengeti District Council and the Treasury**

➤ **Enhancement actions**

- Visitors and revenue records shall as appropriately as possible be kept;
- Relevant reports shall be submitted to SENAPA and the Tanzania Revenue Authority (TRA) to ensure there is no fees and taxes avoidance;
- A dumping fee shall be paid to the local authorities to boost their income base;
- Corporate social responsibility to neighboring local communities shall be executed to make people appreciate the presence of the facility.

7.2.2 Negative impacts

❖ **Reduction of water and interruption of its flow patterns**

❖ **Mitigation measures**

- The proposed development shall use underground water from a deep borehole to be drilled in nearby surroundings;
- Water-serving devices shall be installed at the lodge;
- The system of re-using towels and other linen by guests shall be encouraged; and,
- Rain water particularly for staffs use shall be harvested in order to thus minimize water utilization from a borehole.

❖ **Potential for increased poaching and banditry in the area**

➤ **Mitigation measures**

- An armed guard shall be employed from a registered and reputable security company to supervise other guards with para-military training;
- There shall be six guard posts on the lodge periphery provided with radios to easy communication between guards;
- The Company shall collaborate with guards and game scouts from other developers in the park and rangers from SENAPA to conduct organized joint patrols;
- All employees at the lodge shall be issued with identity cards and a copy of each staff photograph kept by the developer and another one by SENAPA;
- Employees shall be required to carry identity cards particularly when they are out of the lodge; and,
- Employees shall be encouraged to report to the management of the lodge if any doubtful movement is observed.

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❖ **Effect of dust to humans, wild animals and plants**

➤ **Mitigation measures**

- Bumps shall be placed along a track going to the site in order to minimize dust generated by speeding vehicles; and,

- Heavy penalties shall be imposed to Company drivers who will drive beyond the park's speed limit.

❖ **Interference with wildlife dispersal areas**

➤ **Mitigation Measures**

- The lodge compound shall not be fenced so as to allow free movement of animals;
- Some structures will be raised at least half a meter above the ground on wooden plinths to allow free movement of small creatures; and,
- Lamps along walkways shall be fade and down-casted to reduce illuminating light.

❖ **Introduction of invasive plant species through foodstuffs and ornamental plants**

➤ **Mitigation measures**

- Intensive screening of foodstuffs prior to bringing them in the park shall be instituted;
- Importation of ornamental plants into the park shall be prohibited; and,
- Alien plants to be identified within the lodge premises shall be removed.

❖ **Contamination of soil and water both surface and underground by sewage**

➤ **Mitigation Measures**

- Sewage shall pass through 100mm PVC pipes to regularly inspected treatment plant where wastewater shall be recycled for non-human consumption utilization;
- Primary sludge shall be dewatered and dry for use as manure by local farmers outside the park, and,
- The architectural design provides channels for storm water into natural vegetation.

❖ **Contamination of soil and water both surface and underground by oil spills**

➤ **Mitigation measures**

- Regular inspection of vehicles, a generator and a water pumping machine shall be conducted to control accidental oil spillage and leakages;
- A passageway on screed cement surface to drain oil spills into the collection point shall be provided at the workshop; and,
- Used oil shall be kept temporarily in safe drums then donated to local people for treating construction woods.

❖ **Generation of solid waste that may create breeding sites for disease vectors**

➤ **Mitigation measures**

- Sorting waste into different types and stored in different containers at the site shall be undertaken.
- Wet waste shall be compressed, dried and burned in the engineering designed burning chamber covered with a firm lid.
- Non-decomposable waste shall be transported to Arusha City by a registered company for recycling.
- Empty containers previously containing poisonous chemicals shall be kept separately in plastic papers then transported to Arusha City by a registered company for recycling.

❖ **Cumulative effects of solid waste as a result of establishing an additional facility**

➤ **Mitigation Measures**

- The Company shall join hands with other developers in Serengeti ecosystem to upgrade the existing dumping site located in the outskirts of Mugumu town;
- Waste shall be sorted and kept in different containers at the lodge prior to transporting them outside the park mainly for recycling;
- All waste disposal fees shall be paid as appropriately as required to boost the capacity of their management.

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

In order to facilitate smooth implementation of the project, relevant stakeholders have to collaborate with the developer in executing mitigation measures and enhancement actions recommended in this EIS. Table 9 provides an ESMP, which the developer has to make sure is implemented. The plan indicates the identified significant impacts, enhancement/mitigation measures, and institutional responsibilities. Budget for mitigating the impacts, which architectural design does not incorporate is also indicated.

8.1 Implementation of the ESMP

Apart from financing the implementation of the ESMP, the developer shall undertake the following tasks:

- Recording compliance with environmental protection specifications and liaising with relevant stakeholders whenever required;
- Liaising with environmental consultant(s) for particular specialist advice whenever necessary;
- Liaising with relevant ministries, government institutions, local government, local community, interested parties including Non Governmental Organizations and Community-Based Organizations whenever necessary; and,
- Assigning specific environmental responsibilities to lodge managers and supervisors.

8.2 ESMP Implementation Cost

The cost for implementing this ESMP during all phases of the project execution including decommissioning without considering inflation is TZS 103,000,000 as shown in Table 9. Out of the total estimated cost for impact mitigation management TZS 9,000,000 will be expended during decommissioning phase. While the impact management cost for the operation phase is yearly and the estimates provided are for year one of implementation, which is anticipated to decline during succeeding years, mitigation expenditure for pre-construction, construction and decommissioning will cease once those phases have been completed. It should be noted that the cost, which is not shown in the ESMP is incorporated in the design of the proposed facility. Further, the cost for environmental supervisor(s) shall be included in the overall operational expenses.

Table 9 Environmental and social mitigation plan

Identified Impact	Mitigation/Enhancement Measures	Responsible Institution	Cost (TZS)
Significant impacts associated with pre-construction and construction phases			
Positive			
Provision of employment and the subsequent contribution to war against poverty	• Employment priority for unskilled as well as skilled personnel whenever available shall be given to people from neighboring villages. • Employment shall consider gender but females will be given priority where their qualifications will be the same as that of males. • Employees shall be paid reasonable wages according terms of employment as provided in the operating policies. • Training on saving and loan schemes shall be provided to workers.	M/s Kamal Alloys Limited	4,000,000
Negative			
Potential for injuries and deaths to people and wildlife caused by machineries and speeding vehicles	• Construction workers shall be provided with protective gear including heavy boots, pair of overalls, helmets, hand gloves, eye shields, earmuffs and mouth covering devices to reduce chances of injuries. • Use of protective gear shall be enforced. • A first aid kit shall be provided at the construction site and some workers shall be trained on first aid availing procedures. • Bumps shall be placed at regular distances along the track going to the proposed site so as to control speed. • Drivers shall be warned and penalized if found driving beyond speed limits both within and outside the park.	M/s Kamal Alloys Limited	1,000,000
Potential for increased poaching and banditry resulting from human influx	• SENAPA and village leaders from where employees will come from shall be involved in scrutinizing and screening potential candidates for employment. • One copy of a photograph for construction personnel recruited from villages shall be kept by the respective Village Council, another kept at SENAPA office and a third copy shall be kept by the developer at the construction site. • A photograph of any employee who will resign or terminated from employment shall be surrendered to the Police Station. • All construction employees shall be given temporary identity cards and required to carry them all the time especially when they are out of the construction site. • Mechanism shall be devised to ensure effective communication among all developers in the park and collaboration with the Police force and rangers from SENAPA shall be instituted to deal with security in the area. • Assistance of a ranger from SENAPA who will be stationed at the construction camp most of the time shall be requested. • Roll-calls for construction personnel shall be taken every morning before the work starts and	M/s Kamal Alloys Limited	10,000,000

	tonight before going to bed to follow up staff movements.		
Formation of gullies, soil erosion, increased runoff and sedimentation resulting from vegetation clearance	- Construction activities shall take place end of rainy season or during dry season. - Vehicle movement shall be confined to designated tracks. - Adequate open channels shall be provided to collect storm water. - Vegetation clearance shall be limited to unavoidable situation.	M/s Kamal Alloys Limited	500,000
Effect of noise to humans and wildlife	- Construction activities shall take place during the day and leave wildlife free during the night when many species are active. - Modern machinery and vehicles that generate low noise shall be used. - Construction crew shall be required to keep noise as low as possible when at the site.	M/s Kamal Alloys Limited	500,000
Effect of dust to humans, wild animals and the vegetation	- A bowser shall be provided to sprinkle on cleared sites and pathways to reduce dust. - Bumps shall be placed along a track, which goes to the site in order to minimize generation of dust by speeding vehicles. - Masks shall be given to construction personnel to prevent them from dust effects.	M/S Kamal Alloys Limited	2,000,000
Interference with wildlife dispersal areas and calving grounds	- Most of the construction works shall be done during dry season when the migration is away from the site. - A construction camp shall not be fenced to allow free movement of animals. - Arrangement to station a ranger from SENAPA at the construction site to enforce park regulations shall be made.	M/s Kamal Alloys Limited	6,000,000
Introduction of invasive plant species through building materials	- Collection of building materials from areas known to harbor alien plant species shall be avoided. - Intensive screening shall be undertaken before importing building materials and foodstuffs to the site. - During re-planting, only indigenous plant species shall be planted. - Any alien plants identified at the site shall be removed.	M/s Kamal Alloys Limited	6,000,000
Transmission of sexual diseases particularly HIV/AIDS	- Professionals from OSHA shall be invited to provide safety and health awareness training to workers putting more emphasis on communicable diseases in particular HIV/AIDS and other sexually transmitted diseases. - Workers shall be encouraged to voluntarily test for HIV/AIDS. - Adequate protective gear particularly condoms shall be provided at the construction site. - Aspects of hygiene and cleanliness shall be emphasized at the construction camp - Enough tents shall be provided to avoid congestion.	M/s Kamal Alloys Limited	6,000,000
Contamination of soil and water by oil spills from construction vehicles and other equipment	- Regular inspection of construction vehicles and other equipment shall be done in order to control accidental oil spillage and leakages. - A passageway on screed cement surface to drain oil spills into collection point shall be provided at the workshop. - Used oil shall be stored in drums and then donated to local people for treating construction woods.	M/s Kamal Alloys Limited	4,000,000

Generation of solid waste and creation of breeding sites for disease vectors	- Containers for collecting different types of solid waste shall be placed at the site and sorting done immediately after the rubbish has been produced. - Burnable waste shall be burnt immediately after they are produced in the engineering designed burning chamber to be covered with firm lid. - Non-decomposable waste shall be transported by a contracted and registered waste transporter to Arusha city for recycling.	M/s Kamal Alloys Limited	10,000,000
Significant impacts associated with operation phase			
Positive			
Provision of employment and its subsequent contribution to war against poverty	- Villagers neighboring the proposed site shall be given priority in employment; - Village Game Scouts shall be considered for employment particularly as guards and guides during short walks; - Employment shall consider gender but females will be given priority where their qualifications will be the same as that of males; - Workers shall be paid reasonable wages as stipulated in the Employment Policy and the Employment and Labour Relations Act; - Staffs performing at highest level of compliance shall be rewarded; and, - Training on saving and loan schemes shall be provided to workers.	M/s Kamal Alloys Limited	3,000,000
Availability of other income generating activities to local people	- People from the local community shall be encouraged to produce quality farm products for lodge supplies and souvenirs for sale to visitors. - Training shall be provided to volunteers from the local community to provide interpretative services. - Other essentials for the operation of the lodge such as equipment for sanitary shall be purchased from businesspeople in Mugumu and Bunda townships.	M/s Kamal Alloys Limited	4,000,000
Added tourist beds in SENAPA	Collaboration with other stakeholders including TANAPA and particularly SENEPA Management to ensure to provide high standard services.	M/s Kamal Alloys Limited	2,000,000
Increased revenue to TANAPA, Serengeti District Council and the Treasury	- Visitors and revenue records shall be kept as appropriately as possible. - Relevant reports shall be submitted to SENAPA and the TRA to ensure there is no fees and taxes avoidance. - The developer shall execute corporate social responsibility to neighboring local communities in order to make people appreciate the presence of the facility.	M/s Kamal Alloys Limited	3,000,000
Negative			
Reduction of water and interruption of flow patterns	- The proposed development shall use underground water from a deep borehole to be drilled in nearby surroundings; - Water-serving devices shall be installed at the lodge; - The system of re-using towels and other linen by guests shall be encouraged; and, - Rain water particularly for staffs use shall be harvested in order to thus minimize water	M/s Kamal Alloys Limited	2,000,000

	utilization from a borehole.		
Potential for increased poaching and banditry in the area	• An armed guard shall be employed from a registered and reputable security company to supervise other guards with para-military training. • Six guard posts shall be established on the periphery of the lodge and provided with radios for communicating among themselves. • The Company shall collaborate with guards and game scouts employed by other developers in the park and rangers from SENAPA to organized joint patrols. • All employees at the lodge shall be issued with identity cards and a photograph copy of every staff shall be kept by the developer and another one by SENAPA. • Lodge employees shall be required to carry identity cards particularly when they are out of the work premises. • Employees shall be encouraged to report to the lodge management on any observed doubtful movements.	M/s Kamal Alloys Limited	6,000,000
Effect of dust to humans, wild animals and plants	• Bumps shall be placed along a track going to the site in order to minimize dust to be generated by speeding vehicles. • Heavy penalties shall be imposed to Company drivers found driving beyond the park's speed limit.	M/s Kamal Alloys Limited	1,000,000
Interference with wildlife dispersal areas and calving grounds	• The lodge compound shall not be fenced so as to allow free movement of animals • Some structures shall be raised at least half a meter above the ground on wooden plinths to allow free movement of small creatures. • Lamps along walkways shall be fade and down-casted to reduce illuminating light; • Signboards prohibiting visitors and employees to feed animals shall be placed in strategic locations.	M/s Kamal Alloys Limited	1,000,000
Introduction of invasive plant species through foodstuffs and ornamental plants	• Intensive screening of foodstuffs prior to bringing them in the park shall be instituted. • Importation of ornamental plants into the park shall be prohibited. • Alien plants to be identified at the site shall be removed.	M/s Kamal Alloys Limited	3,000,000
Contamination of soil and water both surface and underground by sewage	• Sewage shall pass through 100mm PVC pipes to regularly inspected treatment plant where wastewater shall be recycled for non-human consumption utilization; • Primary sludge shall be dewatered and dry for use as manure by local farmers outside the park, and, • The architectural design provides channels for storm water into natural vegetation...	M/s Kamal Alloys Limited	2,000,000
Contamination of soil and water both surface and underground by oil spills	• Regular inspection of vehicles, a generator and a water pumping machine shall be undertaken to control accidental oil spillage and leakages. • A passageway on screed cement surface to drain oil into a collection point shall be provided at the workshop. • Oil shall be stored in safe drums then donated to local people for treating construction woods.	M/s Kamal Alloys Limited	1,000,000

Generation of solid waste that may create breeding sites for disease vectors	• Sorting waste into different types and stored in different containers at the site shall be undertaken. • Wet waste shall be compressed, dried and burned in the engineering designed burning chamber covered with a firm lid. • Non-decomposable waste shall be transported to Arusha City by a registered company for recycling. • Empty containers previously containing poisonous chemicals shall be kept separately in plastic papers then transported to Arusha City by a registered company for recycling.	M/S Kamal Alloys Limited	10,000,000
Cumulative effects of solid waste as a result of establishing additional facility	• The Company shall join hands with other developers in Serengeti ecosystem to upgrade the existing dumping site located in the outskirts of Mugumu town; • Waste shall be sorted and kept in different containers at the lodge prior to transporting them outside the park mainly for recycling; • All waste disposal fees shall be paid as appropriately as required to boost the capacity of their management.	M/s Kamal Alloys Limited	6,000,000
Significant impacts associated with decommissioning			
Positive			
Site restoration	• Rubble and other building materials for structures to be demolished shall be removed from the site and disposed off as appropriately as possible. • Proper landscaping shall be undertaken. • Indigenous trees and grasses to the area shall be replanted.	M/s Kamal Alloys Limited	3,000,000
Availability of accommodation facilities for TANAPA rangers to control poaching.	• Structures built of permanent materials shall be retained and handed over for use by TANAPA for Park activities.	M/s Kamal Alloys Limited	1,000,000
Minimized water utilization in the park and surrounding areas	A borehole and water storage tank at the site shall be retained for SENAPA use only.	M/s Kamal Alloys Limited	500,000
Reduced risk of introducing invasive alien plant species	• Only indigenous plant species to the area shall be planted when restoring the site; and, • All alien species found at the site shall be uprooted after structure demolition.	M/s Kamal Alloys Limited	1,000,000
Minimized waste generation	• All lodge employees shall vacate the site and leave it for use by TANAPA.	M/s Kamal Alloys Limited	500,000

Negative			
Laying off employees and the resulting change in their life style	- Employees shall be paid terminal benefits as appropriately as per prevailing government policies and regulations. - Employees shall be encouraged to spend wisely their benefits and join saving and loan schemes in their new occupations.	M/s Kamal Alloys Limited	1,000,000
Loss of other economic opportunities to local communities	Local communities and other businesspeople shall be informed at least six months before decommissioning to give them enough time to look into other income generating alternatives.	M/s Kamal Alloys Limited	500,000
Loss of revenue to TANAPA, Serengeti District Council and the Treasury	Stakeholders shall be informed well in advance on the intent of decommissioning to allow them explore alternative sources of income to support development projects and social services that would have otherwise been supported by revenue from the facility.	M/s Kamal Alloys Limited	500,000
Reduced tourist beds against increasing tourist numbers in SENEPA	Stakeholders shall be informed well in advance before decommissioning to enable the Government venture into other sources of income and tour operators arrange for alternative accommodation facilities for their clients.	M/s Kamal Alloys Limited	1,000,000
TOTAL ESTIMATED COST FOR ESMP			TZS 103,000,000

9.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

The EIA and Audit Regulations, 2005 require the developer to prepare a plan and undertake monitoring as well as regular auditing (URT, 2005). Monitoring is needed to check if and to what extent the impacts are being mitigated, benefits enhanced and new problems addressed. Monitoring ensures early detection of conditions that may require new or modified mitigation measures other than those initially suggested. Monitoring also allows the commissioning of mini impact assessments and serves as an evaluation tool to providing information on the progress and results of the mitigation plan.

9.1 Environmental Monitoring

Environmental monitoring is defined as systematic collection of data and information pertaining to the project characteristics, quantities and functioning of environmental variables over space and time. It is an integral part of the environmental project management process. It checks the implementation and success of proposed mitigation measures during all phases of the project execution. Monitoring also reveals changes and trends brought about by the project implementation. Main aspects entailing monitoring are:

- Environmental status of the project;
- Identification of unexpected environmental and socio-economic impacts; and,
- Checking the effectiveness of mitigation measures; and,
- Providing mechanism and opportunity for making decisions.

Monitoring plan for this project will focus mainly to significant impacts which include:

- Employment and availability of opportunities for income generation to local people and the subsequent contribution to war against poverty;
- Trend in visitor numbers to be accommodated at the lodge;
- Trend in revenue generation by TANAPA, Serengeti District Council and the Central Government from the lodge;
- Trend in liquid and solid waste generation and its subsequent management;
- Trend in water utilization;
- Reports on poaching and banditry incidences within and in the vicinity of the proposed facility;
- Level of environmental protection including both fauna and flora of the area;
- Degree of assurance for good health and safety to people; and,
- Type and extent of impacts that were not identified during EIA process and mitigation measures taken.

9.2 Environmental Audit

The EIA and Audit Regulations (URT, 2005) direct the carrying out of regular environmental audits following the completion of EIA in order to determine long-term outcomes of adopted mitigation measures and therefore become part of the environmental remedial program. The audits will unveil the actual performance of mitigation measures and will allow effective corrections to be included in future projects of the same kind based on policies and legislation in force. In Tanzania environmental audit is the responsibility of the developer, which is M/s Kamal Alloys Limited (Avika Hotels and Resorts Ltd) in this case, and NEMC enforces its compliance.

Table 10 shows the EMP, which includes identified impacts, proposed mitigation measures, parameters to be monitored, frequency, the implementer, monitoring indicators and estimated cost, which amounts to TZS 62,000,000. This annual estimated cost is only indicative and therefore, the developer shall have to work out actual cost every year and include them in the overall audit process of the project. In order to conform to the requirements of EMA, (URT, 2004), NEMC will be responsible for the enforcement of compliance of all the commitments addressed in this EIS.

Table 10 Environmental and social monitoring plan

Identified Impact	Mitigation/Enhancement Measures	Monitoring frequency	Parameter to be monitored	Target/Standard	Cost (TZS) per year
Significant impacts associated with construction phase					
Positive					
Provision of employment and the subsequent contribution to war against poverty	• Employment priority for unskilled as well as skilled personnel whenever available shall be given to people from neighboring villages. • Employment shall consider gender but females will be given priority where their qualifications will be the same as that of males. • Employees shall be paid reasonable wages according to all terms of employment as provided in the operating policies. • Training on saving and loan schemes shall be provided to workers to make them save money for future use when employment ends.	Yearly	• Number and sex of employees from adjacent community • Number and type of training provided to employees	• At least 80% of all construction workers of come from neighboring community which at 10% all them are females. • One training on safety and health by OSHA and another one on environmental conservation as well as park regulations by TANAPA per year	1,000,000
Negative					
Injuries and sometimes deaths to people and wildlife, which may be caused by machineries and speeding vehicles.	• Construction workers shall be provided with protective gear including heavy boots, pair of overalls, helmets, hand gloves, eye shields, earmuffs and mouth covering devices to reduce chances of accidents and injuries. • The use of protective gear shall be enforced. • First aid kits shall be provided at the construction site and some workers shall be trained on first aid availing procedures. • Bumps shall be placed at regular distances along the track going to the proposed site so as to control speed. • Drivers shall be warned and penalized if found driving beyond speed limits both within and outside the park.	Half yearly	• Number of operational first aid kits available at the site • Number and type of protective devices provided and used	• Two first aid kits at the construction site. • Appropriate protective gear to each worker during.	2,000,000
Potential for increased poaching and banditry resulting from human influx.	• SENAPA and village leaders from where employees will come from shall be involved in scrutinizing and screening potential candidates for employment. • One copy of a photograph for construction personnel recruited from villages shall be kept by the respective Village Council, another kept at SENAPA office and a third copy shall be kept by the developer at the construction site.	M/s Kamal Alloys Limited	• Number of patrol days conducted in cooperation with other stakeholders • Number of criminal and poaching incidences reported	• Two joint patrols in a year. • Zero number of poaching and criminal reported	1,000,000

	• A photograph of any employee who will resign or terminated from employment shall be surrendered to the Police Station. • All construction employees shall be given temporary identity cards and required to carry them all the time especially when they are out of the construction site. • Mechanism shall be devised to ensure effective communication among all developers in the park and collaboration with the Police force and rangers from SENAPA shall be instituted to deal with security in the area. • Assistance of a ranger from SENAPA who will be stationed at the construction camp most of the time shall be requested. • Roll-calls for construction personnel shall be taken every morning before the work starts and tonight before going to bed to follow up staff movements.		within the camp area		
Formation of gullies, soil erosion, increased runoff and sedimentation resulting from vegetation clearance	• Construction activities shall take place end of rainy season or during dry season. • Vehicle movement shall be confined to designated tracks. • Adequate open channels shall be provided to collect storm water. • Vegetation clearance shall be limited to unavoidable situation.	Monthly	• Number and tree species cut • Amount of soil eroded	• No single tree cut down • Zero m³ of soil eroded	1,000,000
Effect of noise to humans and wildlife	• Construction activities shall take place during day time so as leave wildlife free during the night when many species are active. • Modern machinery and vehicles that generate low noise shall be used. • Construction crew shall be required to keep noise as low as possible at the site.	Monthly	• Number of complaints raised by construction personnel on effects of noise	• Zero complaints reported.	500,000
Effect of dust to humans, wild animals and the vegetation	• A bowser shall be provided to sprinkle on cleared sites and pathways to reduce dust. • Bumps shall be placed along a track going to the site in order to minimize the generation of dust by speeding vehicles. • Masks shall be given to construction personnel to prevent them from dust effects.	Daily during dry season	• Particulate matter in the air.	• Maximum 0.08mg/kg per day	8,000
Interference with wildlife dispersal areas and calving grounds	• Most of the construction works shall be done during dry season when the migration is away from the site. • A construction camp shall not be fenced to allow free movement of animals. Arrangement to station a ranger from SENAPA at the construction site to enforce park regulations shall be made.	Daily	• Number of incidences observed on animals being harassed	• Zero incidences	500,000
Introduction of invasive plant species through building materials	• Collection of building materials from areas known to harbor alien plant species shall be avoided; • Intensive screening shall be undertaken before importing the material	Quarterly	• Alien plant species and area invaded	• Zero m² of alien plant species invasions	1,000,000

	- to the site. - During re-planting, only indigenous plant species shall be planted. - Alien plants to be identified at the site shall be uprooted.		recorded at the site Alien plant species and area cleared of invasions	The whole invade area if any cleared	
Transmission of sexual diseases particularly HIV/AIDS	- Professionals from OSHA shall be invited to provide safety and health awareness training to workers putting emphasis on communicable diseases in particular HIV/AIDS and other sexually transmitted diseases. - Workers shall be encouraged to voluntarily test for HIV/AIDS. - Adequate protective gear particularly condoms shall be provided at the construction site. - Aspects of hygiene and cleanliness shall be emphasized at the construction camp - Enough tents shall be provided to avoid congestion.	Yearly	- Number of visits made by health and safety professionals - Number of condoms provided and used at the site - Incidences of reported workers contracting HIV/AIDS	- One visit per year by OSHA officials. 2,000 boxes of 12-pieces per box of condoms - Zero number of workers reported to contract HIV/AIDS	1,000,000
Contamination of soil and water by oil spills from construction vehicles and other equipment	- Regular inspection of construction vehicles and other equipment shall be done in order to control accidental oil spillage and leakages. - A passageway on screed cement surface to drain oil into the collection point shall be provided at the workshop. - Used oil shall be stored in drums and then donated to local people for treating construction woods.	Monthly	Average volume of Biochemical Oxygen Demand (BOD) in the water.	Average of 6.0mg/L in 5 days at 30⁰	6,000,000
Generation of solid waste and creation of breeding sites for disease vectors	- Containers for collecting different types of solid waste shall be placed at the site and sorting done immediately after the rubbish has been produced. - Burnable waste shall be burnt immediately after they are produced in the engineering designed burning chamber to be covered with firm lid. Non-decomposable was shall be transported by a contracted and registered waste transporter to Arusha city for recycling.	Monthly	- Amount of different types of waste generated - Total filterable residue in water.	- Not more than 120Kg waste of different kinds per day - Range between 500 and 2,000mg/L	3,000,000
Significant impacts associated with operation phase					
Positive					

Provision of employment and its subsequent contribution to war against poverty	• Villagers neighboring the proposed site shall be given priority in employment; • Village Game Scouts shall be considered for employment particularly as guards and guides during short walks; • Employment shall consider gender but females will be given priority where their qualifications will be the same as that of males; • Workers shall be paid reasonable wages as stipulated in the Employment Policy and the Employment and Labour Relations Act; • Staffs performing at highest level of compliance shall be rewarded; and, • Training on saving and loan schemes shall be provided to workers.	Yearly	• Number and sex of employees from adjacent community • Number and type of training provided to employees	• At least 50% of all employees come from neighboring community and at least 10% females of all workers. • One training on safety and health by OSHA and another one on environmental conservation as well as park regulations by TANAPA per year	1,000,000
Availability of other income generating activities to local people	• People from the local community shall be encouraged to produce quality farm products for lodge supplies and souvenirs for sale to visitors. • Training shall be provided to the local community to provide interpretative services. • Other essentials for the operation of the lodge such as equipment for sanitary shall be purchased from businesspeople in Mugumu and Bunda townships.	Yearly	• Supplies sold to the lodge by local and business people • Number of people from the local community giving interpretative services in villages • Numbers of traditional dances are performed before visitors at the lodge	• At least 5% of supplies to the lodge come from the local community. • At least 5 people from the local community trained in interpretative services. • At least one traditional dances performance is organized every month	1,000,000
Added tourist beds in SENAPA	• The developer shall collaborate with other stakeholders including TANAPA and particularly SENEPA Management to provide high standard services.	Yearly	• Number of visitors to be accommodated at the lodge	• An average of 80% and 50% visitor occupancy at the lodge during high and low seasons respectively	1,000,000
Increased revenue to TANAPA, Serengeti District Council and the Treasury	• Visitors and revenue records shall be kept as appropriately as possible. • Relevant reports shall be submitted to SENAPA and TRA to ensure there is no fees and taxes avoidance. • Corporate social responsibility to neighboring local communities shall be executed to make people appreciate the presence of the facility.	Yearly	• Amount of money paid as fees and tax to TANAPA and Treasury respectively. • Amount of amount money spent on local development and social	• 100% prescribed fees and taxes. • Between 2% and 5% of the profit	2,000,000

			projects		
Negative					
Reduction of water and interruption of its flow patterns	• The proposed development shall use underground water from a deep borehole to be drilled in nearby surroundings; • Water-serving devices shall be installed at the lodge; • The system of re-using towels and other linen by guests shall be encouraged; and, • Rain water particularly for staffs use shall be harvested in order to thus minimize water utilization from a borehole.	Quarterly	• Amount of water in liters utilized at the lodge • Amount of water in liters recycled for use in non-human consumption activities	• Average of 4,000 liters and 5,000 liters utilization per day during construction and operation respectively. • Approximately 2,100 liters to be recycled per day	1,000,000
Potential for increased poaching and banditry incidences in the area	• An armed guard shall be employed from a registered and reputable security company to supervise other guards with para-military training. • Six guard posts shall be established on the periphery of the lodge and provided with radios for communicating among themselves. • The Company shall collaborate with guards and game scouts employed by other developers in the park and rangers from SENAPA to organized joint patrols. • All employees at the lodge shall be issued with identity cards and a photograph copy of every staff shall be kept by the developer and another one by SENAPA. • Lodge employees shall be required to carry identity cards particularly when they are out of the work premises. • Employees shall be encouraged to report to the lodge management on any observed doubtful movements.	Yearly	• Number of joint patrols conducted by stakeholders • Number of poaching and banditry incidences reported	• Two joint patrols in a year. • Zero number of poaching and criminal reported	3,000,000
Effect of dust to humans, wild animals and plants	• Bumps shall be placed along a track going to the site in order to minimize dust to be generated by speeding vehicles. • Heavy penalties shall be imposed to Company drivers found driving beyond the park's speed limit.	Quarterly	• Particulate matter in the air.	• Maximum 0.08mg/kg per day	500,000
Interference with wildlife dispersal areas and calving grounds	• The lodge compound shall not be fenced so as to allow free movement of animals • Most of the structures will be raised at least half a meter above the ground on wooden plinths to allow free movement of small creatures. • Lamps along walkways shall be fade and down-casted to reduce illuminating light; • Visitors and lodge employees shall be prohibited from feeding animals.	Quarterly	• Number of incidences observed on animals being harassed	• Zero incidences	500,000

Introduction of invasive plant species through foodstuffs and ornamental plants	• Intensive screening of foodstuffs prior to bringing them in the park shall be instituted. • Importation of ornamental plants into the park shall be prohibited. • Alien plants found at the site shall be removed.	Yearly	• Alien plant species and area invaded recorded at the site • Alien plant species and area cleared of invasions	• Zero m² of alien plant species invasions • The whole invade area if any cleared	2,000,000
Contamination of soil and water both surface and underground by sewage	• Sewage shall pass through 100mm PVC pipes to regularly inspected treatment plant where wastewater shall be recycled for non-human consumption utilization; • Primary sludge shall be dewatered and dry for use as manure by local farmers outside the park, and, • The architectural design provides channels for storm water into natural vegetation...	Half yearly	• Nitrate levels in drinking water. • Fluoride levels in drinking water. • Total filterable residue in drinking water. • PH in drinking water. • Amount of ammonia in water. Not to exceed 2.0mg/L	• Nitrate range between 10mg/L and 75mg/L • Fluoride range between 1.5 mg/L and 4.0mg/L • Total filterable residue range between 500mg/L and 2,000mg/L • PH levels range between To be between 6.5 and 9.2 • Ammonia not more than 2.0mg/L	9,000,000
Contamination of soil and water both surface and underground by oil spills	• Regular inspection of vehicles, a generator and a water pumping machine shall be undertaken to control accidental oil spillage and leakages. • A passageway on screed cement surface to drain oil into a collection point shall be provided at the workshop. • Oil shall be stored in safe drums then donated to local people for treating construction woods.	Half yearly	• Average volume of Biochemical Oxygen Demand (BOD) in the water.	• Average of 6.0mg/L in 5 days at 30⁰	6,000,000

Generation of solid waste thus, creation of breeding sites for disease vectors	• Sorting waste into different types and stored in different containers at the site shall be undertaken. • Wet waste shall be compressed, dried and burned in the engineering designed burning chamber covered with a firm lid. • Non-decomposable waste shall be transported to Arusha City by a registered company for recycling. • Empty containers previously containing poisonous chemicals shall be kept separately in plastic papers then transported to Arusha City by a registered company for recycling.	Half yearly	• Amount of different types of waste generated • Total filterable residue in water.	• Not more than 160Kg and 80Kg waste of different kinds per day • Range between 500 and 2,000mg/L	3,000,000
Cumulative effects of solid and liquid waste due to additional facility	• The Company shall join hands with other developers in Serengeti ecosystem to upgrade the existing dumping site located in the outskirts of Mugumu town; • Waste shall be sorted and kept in different containers at the lodge prior to transporting them outside the park for appropriate disposal; • All waste disposal fees shall be paid as appropriately as required to support well functioning of disposal sites	Yearly	• Type and amount of waste generated and disposed off • Amount of ammonia in water. Not to exceed 2.0mg/L	• Not more than 43,800 Kg of different waste generated per year	1,000,000
Significant impacts associated with decommissioning					
Positive					
Site restoration	• Rubble and other building materials for structures to be demolished shall be removed from the site and disposed off as appropriately as possible. • Proper landscaping shall be undertaken. • Indigenous trees and grasses to the area shall be replanted.	Once during decommissioning	• Number of indigenous trees planted • Amount of rubble in removed from the site • Area restored.	• 100 tons of rubble • 500 Acacia trees • Maximum 12,080m²	1,000,000
Availability of accommodation for TANAPA ranger to control poaching	Structures built of permanent materials shall be retained and handed over for other Park uses.	Once during decommissioning	• Number of buildings retained.	• All permanent structures	500,000
Minimized water utilization in the park and surrounding areas	A borehole and water storage tank at the site shall be retained for SENAPA use only.	Once one month after decommissioning	• Amount of water in liters utilized by TANAPA from a	• Less than 4,000 liters. in one month	500,000

		oning	retained borehole		
Reduced risk of introducing invasive alien plant species	- Only indigenous plant species to the area shall be planted when restoring the site. - All alien plant species found at shall be uprooted after demolition of structures.	Once during decommissioning	Area or number of different alien plant species recorded at the site	Zero record	1,000,000
Minimized waste generation	All lodge employees shall vacate from the site and left for use by TANAPA.	Once during decommissioning	Amount of solid waste generated by TANAPA activities at the site	Less than 80Kg per day	500,000
Negative					
Laying off employees and the resulting change in their life style	- Employees shall be paid terminal benefits as appropriately as per prevailing government policies and regulations. - Employees shall be encouraged to spend wisely their benefits and continue or join saving and loan schemes in their new occupations.	Once during decommissioning	Number of employees given advice on what to do after decommissioning	Maximum 80 people	500,000
Loss of other economic opportunities by local communities	Local communities and other businesspeople shall be informed at least six months before decommissioning to give them enough time to look into other income generating alternatives.	Monthly for six months before decommissioning	Frequency of giving notice to local communities and business people	Once per month	500,000
Loss of revenue to TANAPA, Serengeti District Council and the Treasury	Stakeholders shall be informed well in advance on the intent of decommissioning to allow them explore alternative sources of income to support development projects and social services that would have otherwise been supported partly by revenue from the facility.	One year before decommissioning	Frequency of giving notice to stakeholders receiving revenue from the lodge	Once every month	1,000,000
Reduced tourist beds against increasing tourist numbers in SENEPA	The Government shall be informed well in advance before decommissioning to enable it venture into other sources of income and also tour operators to arrange for alternative accommodation facilities for their clients.	One year before decommissioning	Frequency of giving notice to stakeholders receiving revenue from the lodge	Once every month	1,000,000
TOTAL COST FOR MONITORING				TZS 62,000,000	

10.0 RESOURCE EVALUATION OR COST-BENEFIT ANALYSIS

10.1 Benefits Related to the Project

Several benefits are associated with the proposed development at local, national and international levels with regard to tourist's enjoyment and satisfaction, revenue generation and poverty alleviation. The proposed facility will generate employment and other sources of income to surrounding communities and businesspeople in Serengeti and Bunda districts such as the sale of foodstuffs, interpretative services avenues by local people and chances for performing traditional dances. Most of the construction materials will be purchased from Arusha City. Arusha City is a gateway for tourist attractions in northern Tanzania including SENAPA. Kamal Alloys Limited (Avika Hotels and Resorts Ltd) will partner with Sarovar Hotels and Resorts Company; a reputable foreign Company in the hospitality industry to manage the proposed Serengeti Belabela Lodge. International tourists will spend an average of 10 days in Tanzania. The presence of the proposed high-end tourist accommodation facility in SENAPA will offer international services akin to those offered elsewhere outside the country. Like in other accommodation facilities which the Company collaborates with outside Tanzania, visitor spending will create multiplier effects particularly to businesspeople operating craft shops along Arusha-Karatu highway. Salaries for those who will be employed by the project will extend beyond employees to benefit other people including dependants and relatives. In view of the above, the proposed project aligns well with the government initiatives of creating employment opportunities, enhancing economic growth and alleviation of poverty among Tanzanians.

The proposed facility is also in line with tourism and trade policies. In order to improve tourism industry, the tourism policy targets among other things to partner with foreign and domestic investors to enhance and expand the sector without compromising the preservation of natural, historical and cultural assets. One of the areas requiring improvement according to the National Tourism Policy is the operation of high class accommodation facilities. Kamal Alloys Limited (Avika Hotels and Resorts Ltd) is a Tanzanian registered Company, which will strive to ensure that all employees including those at the managerial level will be Tanzanians. The project will definitely contribute income to TANAPA, Serengeti District Council and the Central Government through fee and tax payments; part of it will be remitted back to local communities for improving social services such as health, education, roads, water supply and security not only within the project area and neighboring villages but also in other parts of the country.

The Trade Policy advocates for facilitation of smooth integration into the MTS and reduction of marginalization among Tanzanians. The policy intends to ensure that liberalization offer meaningful, identifiable and measurable benefits to Tanzania citizens. In support of the National Development Vision 2025, the main objective of the Trade Policy is to raise efficiency, widen linkages in domestic production and build a diversified competition in export sector as a means of stimulating higher rates of growth and development, the goal which the proposed project will contribute to.

10.2 Costs Related to the Project

The proposed facility will however, have considerable cost particularly to surrounding communities with regard to health and safety. The cost may also emanate, if not well managed from increased production of waste leading to offensive disposal, thus affecting animals and human health. Condition of waste receiving dump sites may become appalling as shown in Figures 7 and 8 unless they are well handled. Uncontrolled removal of vegetation may impact negatively plants of exceptional value, interfere with flora, which is critical to wildlife forage, habitat, shelter and range also cause undue erosion. Locating the lodge where it is visible from primary visitor utilization areas and the use of building materials that do not blend with the landscape will not safeguard the visual impact of the facility. Excessive utilization of water may disrupt and interfere with the flow and recharge patterns of surface and subsurface respectively. Water quality may also be contaminated by poorly located and designed sewage disposal site. Having identified and predicted all potential impacts, TZS103,000,000 (Table 4) and TZS 62,000,000 (Table 5) have been estimated for mitigation/enhancement and monitoring respectively of direct, indirect, long term and short term impacts, which are significant. However, some of the impacts will be mitigated once and for all such as those predicted to occur during construction phase and will therefore not recur, meaning that the cost will decrease gradually over years.

11.0 DECOMMISSIONING PLAN

The initial period for right of land occupancy where the proposed facility will be developed is anticipated to be 25 years subject to renewal (TANAPA, 1995). With this regard, it is not expected that the proposed Serengeti-Belabela Lodge will end its operations in the near future. However, in case the operation of the project comes to an end due to whatever reason(s), all decommissioning requirements as provided for in the EIA and Audit Regulations (URT, 2005) shall be adhered to. Impacts mitigation and monitoring activities and its cost during decommissioning are outlined in Tables 9 and 10 respectively. The estimated decommissioning cost shall be reviewed according to terms and conditions dictating at the time of decommissioning. Recommended mitigation measures and enhancement action for significant impacts during decommissioning will be:

11.1 Positive Impacts

❖ Site restoration

➤ Enhancement actions

- Rubble and other building materials for structures to be demolished shall be removed from the site and disposed off as appropriately as possible.
- Proper landscaping shall be undertaken.
- Indigenous trees and grasses to the area shall be replanted.

❖ Availability of accommodation for TANAPA rangers to control poaching.

➤ Enhancement action

- Most of the structures built of permanent materials shall be retained and handed over for TANAPA for activities.

❖ Minimized water utilization in the park and surrounding areas

➤ Enhancement measure

- A borehole and water storage tank at the site shall be retained for TANAPA use only.

❖ Reduced risk of introducing invasive alien plant species

➤ Enhancement measures

- Only indigenous plant species to the area shall be planted when restoring the site; and,
- All alien species found at the site shall be uprooted after structure demolition.

❖ Minimized waste generation

➤ Enhancement measure

- All lodge employees shall vacate the site and leave it for TANAPA uses only.

11.2 Negative Impacts

❖ Laying off employees and the resulting change in their life style

➤ Mitigation measures

- Employees shall be paid terminal benefits as appropriately as per prevailing government policies and regulations; and,
- Employees shall be encouraged to spend wisely their benefits and join saving and loan schemes in their new occupations.

❖ Loss of other economic opportunities to local communities

➤ Mitigation measure

- Local communities and other businesspeople supplying essentials to the lodge shall be informed at least six months before decommissioning to give them enough time to look into other income generating alternatives.

❖ Loss of revenue to TANAPA, Serengeti District Council and the Treasury

➤ Mitigation measure

- Stakeholders shall be informed well in advance on the intent of decommissioning to allow them explore alternative sources of income to support development projects and social services that would have otherwise been supported partly by revenue from the facility.

❖ **Reduced tourist beds against increasing tourist numbers in SENEPA**

➤ **Mitigation measure**

- Stakeholders shall be informed well in advance before decommissioning to enable the Government venture into other sources of income and tour operators arrange for alternative accommodation facilities for their clients.

12.0 SUMMARY AND CONCLUSIONS

The site where the proposed Serengeti-Belabela Lodge will be constructed and later on operation take place, was granted to the developer after successfully winning the bid. The Company's consideration for being awarded the site was among other prerequisites based on its plan to collaborate with Sarovar Hotels and Resorts Company, which has long and reputable business history in the tourism industry including the operation of accommodation facilities internationally. Although the project is expected to deliver an authentic environmentally-conscious destination in SENAPA, it was obligatory according to EMA of 2004 (URT, 2004) and the National Policies for National Parks (TANAPA, 1994) to conduct this EIA study. The EIA study has therefore established many positive conditions that have been taken care of by architectural designs and the project concept. The assessment has however, identified some negative impacts, which need mitigation measures as well as positive situations needing enhancement actions. In view of that, the construction and later on operation of the proposed lodge will comparatively have more benefits than costs and all the identified negative environmental and social impacts could be mitigated. The developer is well vested with relevant national policies, laws and international conventions that govern environmental conservation and safety and human health. To that regard, the developer is committed to implementing all abatement measures and enhancement actions addressed in this EIS.

So long as the developer is obligated to implementing all the mitigation measures and enhancement actions recommended in this EIS as well as in the TANAPA's DALP, environmental experts hereby recommend that the proposed project be allowed to continue as it will have many merits than the anticipated demerits. Long term benefits to be realized from the implementation of the project including among others prospects, local community employment, increased high-end tourist accommodation in SENAPA, assurance to more stay days and subsequently increased revenue to local communities, Serengeti District Council, TANAPA and the Central Government override the identified impacts, which can be reduced, remedied and/or eliminated through the recommended mitigation measures.

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APPENDICES

Appendix 1: Terms of Reference

1.0 INTRODUCTION

M/s Kamal Alloys Limited (Avika Hotels and Resorts Ltd) intends to construct a lodge proposed to accommodate at least 80 visitors at full occupancy in 40-rooms to be located on BelaBela hill ranges at Msabi area in SENAPA, Serengeti District in Mara Region. Main facilities at the camp will be the main building to be comprised of a reception, visitors' lounge, restaurant, kitchen, bar, offices, gift shop, business center, wildlife and photographic education center, cold rooms, stores to keep food and beverage as well as public toilets. Other structures will be staff block to accommodate a maximum of 80 employees at full capacity, 20 rooms for tourist drivers and a ranger from SENAPA. Other structures will be a staff/drivers' canteen, a room to house a backup generator, storage space with a workshop for light maintenance of vehicles and a car parking will be located with the staff quarters premises.

Avika Hotels and Resorts Limited is a Tanzanian registered subsidiary Company of M/s Kamal Alloys Limited. The head office of M/s Kamal Alloys Limited is situated at plot number 188/2, Chang'ombe Road in Dar-es-Salaam. The Company operates in partnership with a foreign Company known as Sarovar Hotels and Resorts, which provides high class services in hotels, lodges, resorts, apartments, water parks, and restaurants' business. Currently Sarovar is one of the leading hotel chains with varied selection of properties, both operational and under development across India and Africa.

Construction of the proposed lodge will therefore be undertaken by M/s Kamal Alloys Limited (Avika Hotels and Resorts Ltd). The collaboration with Sarovar in the management of the proposed Serengeti BelaBela Lodge will bring an international flavor of hospitality and services as well as innovative and unique solutions in Tanzania.

While the proposed project is in line with the National Tourism Policy, which requires the government to partner with both foreign and domestic investors to enhance and expand its tourism industry without compromising the preservation of her natural, historical, cultural and archaeological heritages, M/s Kamal Alloys Limited (Avika Hotels and Resorts Ltd) endeavors to offer its reputation of being a potential Company, which is a responsive supplier of high quality services, a good employer, and a good community member. The Company envisages conducting its activities at the proposed facility in a manner that will ensure sustainability of environmental integrity through minimization of water utilization, use of environmentally-friendly energy mainly solar and dispose-off waste both solid and liquid according to laid down national and international procedures.

To achieve the envisaged aspirations, the EIA study of the proposed project shall be conducted pursuant to the Environmental Management Act Chapter 191 and the EIA and Audit Regulations of 2005. Environmental Management Act of 2004 directs for the conduction of EIA of all development projects that are listed in the First Schedule (*Made under Regulation 6 (1)*) of the EIA and Audit Regulations of 2005. The EIA is being conducted by Dr. Victor Apollo Runyoro; who is an Ecological Economist, Asanterabi Lowassa-Kweka; a Socio-economist and Mr. Kassim Sengoe; a Natural Resource Manager; all registered EIA experts. Services of a reputable Architect with long experience in designing tourist accommodation facilities in the wilderness will be hired.

2.0 OBJECTIVES OF THE TERMS OF REFERENCE

The main objective of this Terms of Reference is to ensure that the EIA for the proposed project is undertaken comprehensively and in participatory manner. The Terms of Reference further outlines the scope of work, methodology to be used and expected output. Composition of EIA experts and the expected

period for accomplishing the assignment are also contained in the Terms of Reference. Among other requirements, the EIA study shall be conducted pursuant to Regulations 13-17 and the report prepared as provided in Regulations 18-21 of the EIA and Audit Regulations of 2005 (URT, 2005).

3.0 SCOPE OF WORK

This EIA study will identify the potential of the project, predict impacts and evaluate their significance. All potential significant impacts shall be identified and taken into account in the study. Prediction will entail the use of various available tools. Mitigation measures and enhancement actions for negative and positive impacts respectively will be proposed. Tasks in this assessment will entail but not limited to the following:

Task 1: Description of the proposed project

Environmental experts shall provide a detailed description of relevant parts of the project using maps where appropriate and include the following:

- Project background
- Justification;
- Location;
- General layout, size and capacity;
- Pre-construction activities;
- Construction activities;
- Operation activities;
- Decommissioning activities;
- Staffing;
- Materials and facilities to be used;
- Services to be provided during project implementation; and,
- Life span of the project.

Task 2: Description of the existing environment

In order to forecast impacts, the study shall assemble, evaluate and present baseline information on relevant environmental characteristics of the project area. Information on any changes anticipated before the project commences shall be included. Topics listed below, which are believed to be critical when implementing the proposed project, may be modified over the course of the EIA. Wherever appropriate, various environmental characteristics at the site where the lodge will be constructed shall be illustrated on maps to facilitate the understanding of the study area. Topics of the study to be covered shall include but not limited to:

- (a) **Physical environment:** This shall cover geology, topography, soils, climate, surface and groundwater, existing sources of air emissions, existing water pollution discharges and receiving water quality.
- (b) **Biological environment:** To be included in this topic shall be flora and fauna incorporating the rare and endangered species if any, ecologically important or sensitive habitats, significant natural sites, species of commercial importance and organisms with potential to become nuisance, vectors or dangerous within the project site and potential area of influence.
- (c) **Socio-cultural environment:** This shall consider aspects related to human population, land use, planned development activities, employment, distribution of income, goods and services, recreation, public health, gender issues, cultural/historic properties and tribal people with their related customs, aspirations and attitudes towards the project.

Task 3: Policy, administrative and legal framework

Environmental experts shall review all guidelines, national policies, legislation and international conventions that are relevant to the proposed undertaking. The report shall specifically describe but not limit itself to regulations and standards governing environmental quality, health and safety, customer satisfaction, people's livelihoods, protection of sensitive areas and protection of endangered species. The objective of this section will be to assess compliance of the developer and the project with policies, laws, administrative and institutional settings both at the national and international levels.

Task 4: Analysis of alternatives to the project

The EIA study shall identify and describe alternatives to the proposed project, which may achieve more or less similar objectives. The concept of alternatives shall consider location, size, design and technological aspects focusing mainly on waste management disposal. The "No project" alternative shall also be considered in the analysis. Environmental experts shall compare alternatives in terms of potential environmental and social impacts, capital and operating costs, suitability under local conditions and institutional and monitoring requirements, and recommend the most suitable one.

Task 5: Identification, analysis and assessment of potential impacts

All potential negative and positive impacts of the proposed development shall be identified. This will entail determination of the magnitude, spatial, temporal, extent and likelihood of impacts, value of the affected environment, likely degree of recovery of the affected environment, level of public concern and political repercussions. In the analysis a distinction shall be made between significant and non-significant, positive and negative, direct and indirect, immediate and long term and reversible and irreversible impacts. Wherever appropriate, the study shall clearly address cumulative and residual impacts. Levels of significance showing the criteria used shall be indicated. Identification, prediction and analysis of impacts shall be made for each stage of implementation, that is, pre-construction, construction, operation and decommissioning phases of the project.

The following issues but not limited to, shall be examined thoroughly:

- (a) Tourist number and the resulting tourism-related revenue to SENAPA;
- (b) Employment creation and other income generating prospects to surrounding people;
- (c) Revenue generation to TANAPA, the Central Government and Serengeti District Council;
- (d) Destruction of ecologically sensitive areas;
- (e) Interference with wildlife dispersal areas and calving grounds;
- (f) Soil and water pollution on site and downstream;
- (g) Direct threat to biodiversity in the area;
- (h) Interference with geology and topography by excavation and earthmoving;
- (i) Traffic congestion along the roads to and from the proposed facility;
- (j) Increased runoff and soil erosion due to loss of vegetation cover;
- (k) Solid and liquid waste management;
- (l) Levels of water use;
- (m) Levels of energy use;
- (n) Effect of noise to humans and wildlife;
- (o) Effects of dust to humans, wildlife and plants;
- (p) Effects of vibration to humans and wildlife;
- (q) Disease transmission; and,
- (r) Cumulative impact of solid and liquid waste within the park and surrounding environment from additional accommodation facility.

Task 6: Mitigation measures

Environmental experts shall suggest cost-effective measures for minimizing or eliminating adverse impacts and actions for enhancing beneficial impacts of the proposed facility.

Task 7: Development of an Environmental and Social Mitigation Plan and an Environmental and Social Monitoring Plan

Environmental experts shall prepare an environmental and social mitigation plan (ESMP) and an environmental and social monitoring plan (EMP), each detailing identified impacts, mitigation/enhancement actions and associated cost. In addition, the EMP shall contain the monitoring parameters and frequency.

Task 8: Resource evaluation or cost-benefit analysis

EIA experts shall undertake a cost-benefit analysis to determine the advantages and disadvantages of the proposed project including cost for enhancement actions of positive impacts and mitigation measures of negative ones. The cost shall be evaluated focusing on potential environmental outcomes, capital and operating and suitability under local conditions. Cost for different alternatives shall be compared and the most suitable and feasible one recommended.

Task 9: Preparation of a decommissioning plan

Although it is not expected that the operation of the proposed lodge will come to an end in the near future, EIA experts shall examine and recommend on what should be done at decommissioning.

4.0 METHODOLOGY

EIA study shall be carried out in two stages as provided in the EIA and Audit Regulations of 2005 (URT, 2005). Stage one shall involve the carrying out of scoping and development of Terms of Reference. The scoping report shall be prepared pursuant to EIA and Audit Regulations of 2005 and submitted to NEMC by the developer for review. After NEMC has reviewed and approved a scoping report and Terms of Reference, environmental experts shall proceed to stage two of the process which is to undertake a detailed EIA.

EIA experts shall ensure that appropriate methods that would enable maximum participation of all key stakeholders are considered. Methods, including the conduction of interviews, holding meetings and focused group discussions shall be employed. Other methods such as electronic communication and phone calls may also be employed where needs arise. While collection of information from secondary sources shall be one of the methods to obtaining information, experts shall physically visit the proposed site and gather relevant facts from the ground.

Environmental experts shall ensure adequate stakeholders' participation throughout the EIA process and show stakeholders' views and concerns in the environmental impact statement (EIS). Evidence including signatures of all individuals who will be consulted shall appear against their names and minutes of the meeting(s) held and/or opinion(s) given shall be appended to the report. A range of stakeholders'

involvement will ensure the capturing of their views and concerns regarding the proposed development. Experts shall therefore consult all key stakeholders including, but not limited to those listed below.

- Serengeti National Park;
- Serengeti District Council;
- Tanzania National Parks;
- Serengeti Wildlife Research Institute;
- Tanzania Wildlife Research Institute;
- Other operators of accommodation facilities in the Serengeti ecosystem;
- Wildlife Department in the Ministry of Natural Resources and Tourism; and,
- Tourism Department in the Ministry of Natural Resources and Tourism.
- UNESCO Country Office; and;
- Lake Victoria Water Basin Office.

5.0 ENVIRONMENTAL EXPERTS

EIA experts shall consist of the following key members:

- Economical Ecologist who will also be the Team Leader
- Socio-economist
- Natural Resource Manager
- Architect.

6.0 REPORTING PROTOCOL

According to EIA and Audit Regulations of 2005, two reports shall be produced at different stages of the study and submitted to NEMC. These are Scoping Report and the EIS. The format and contents of both reports shall be prepared and submitted according to Regulations 18, 19 and 20 of EIA and Audit Regulations of 2005 (URT, 2005).

Environmental experts shall produce and submit to the developer six hard copies of the scoping report, out of those, five copies shall be submitted to the NEMC by the developer. Sixteen copies of EIS shall also be submitted to the developer who in turn shall submit 15 copies to NEMC for review. After the Technical Advisory Committee's comments have been incorporated in the report, environmental experts shall produce 6 hard copies and an electronic copy of the final EIS of which, 5 copies shall be submitted to NEMC by the developer for further scrutiny and submission to the Minister responsible for Environment for final decision.

7.0 ASSIGNMENT SCHEDULE

A scoping report shall be submitted to the developer within 30 days upon engagement in writing. Draft EIS shall be submitted to the developer within 30 days from the date the reviewed scoping report has been received from NEMC and handed to environmental experts. Final EIS shall be submitted to the developer within 15 days after environmental experts have been availed with written Technical Advisory Committee's comments.

Appendix 2: Letter of offer from TANAPA to construct a lodge in SENAPA



TANZANIA NATIONAL PARKS

OFFICE OF THE DIRECTOR GENERAL

P.O.BOX 3134, ARUSHA - TANZANIA

Ref. No: TNP/HQ/P.30/17

Date: 20/10/2015

Director,
Kamal Alloys Ltd,
P. O. Box 10392
DAR ES SALAAM.

Dear Sir,

RE: LETTER OF OFFER TO CONSTRUCT A LODGE IN SERENGETI NATIONAL PARK

I wish to inform you that your request to build a tourist lodge in Serengeti National Park has been accepted.

You are now required to submit your project proposal (development prospective) and a business plan for technical evaluation. The lodge will be of 25 rooms (50 beds).

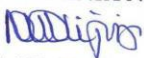
The proposal should also include architectural drawings with design layout of the lodge and staff village. The preparation of the proposal will be according to the Development Action License Procedures (DALP) section III that will be sent to you electronically.

You will need to conduct a hydrological survey before hand. You will commence in carrying out your EIA study at your own cost after submission of your proposal.

During the process, wherever you or your people need to visit the project site will be given free permits on request.

You will report to the Chief Park Warden before going to your site even though you have permits from Head office, Arusha.

Sincerely Yours,
TANZANIA NATIONAL PARKS


A.J.H. Kijazi
DIRECTOR GENERAL

Copy: Chief Park Warden - Serengeti National Park - For Information

Appendix 3: Letter from TANAPA to approve increase of room number

**TANZANIA NATIONAL PARKS
OFFICE OF THE DIRECTOR GENERAL
POBOX 3134 ARUSHA TANZANIA**

Ref. No.TNP/HO/P.30/17

Date 31/01/2017--

Managing Director, Kamal
Alloys, Ltd,
P. O. Box 10392
DAR ES SALAAM.

Dear Sir,

RE: REQUEST TO INCREASE THE NUMBER OF ROOMS

Please refer to your unreferenced letter dated November 31, 2016 on the above subject

Your letter is in reference to our letter of offer (TNP /HQ/P 30/17 of 20/10/2015) where you were allocated 25 rooms (50 beds) at Belabela site in the Serengeti National Park. As a result of your feasibility and market studies you conducted, you have requested for 45 rooms for the project to be economically viable.

Management has analyzed your request and have approved 40 rooms (addition of 15 rooms) or 80 beds for your lodge. Kindly confirm if you are in agreement and since it is almost a year since you received the letter of offer commence on developing the site as per Development Action License Agreement (DALP). We will monitor progress in the next 3 months from the date of this letter.

This letter is an addition to the letter of offer except for the number of beds which have changed as stated above.

Thank you for investing in national parks.

Yours Sincerely,
TANZANIA NATIONAL PARKS

Allan J. H. Kijazi
DIRECTOR GENERAL

cc. DPOP
Chief Park Warden,

For follow up
National Park: For assistance and monitoring Serengeti
progress.

TANZANIA



Certificate of Incorporation

Section 15

No 65167

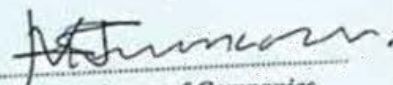
I HEREBY CERTIFY THAT

KAMAL ALLOYS LIMITED =====

is this day incorporated under the Companies
Act 2002 and that the Company is Limited

Given under my hand at Dar es salaam

this 21ST day of APRIL
TWO THOUSAND AND EIGHT


Assist. Registrar of Companies

Appendix 5 Certificate of incentive from TIC


THE UNITED REPUBLIC OF TANZANIA

0223346

Certificate of Incentives
(Section 17 of the Tanzania Investment Act, 1997)

No. 032266

This is to certify that

KAMAL ALLOYS LIMITED

P.O. BOX 10392

of address, **DAR ES SALAAM**

has been granted a Certificate of Incentives to invest in a new ~~XXXXXXXXXXXXXXX~~ enterprise known as

KAMAL ALLOYS LIMITED

Which is located at **DELAELA SITE, SERENGETI NATIONAL PARK**

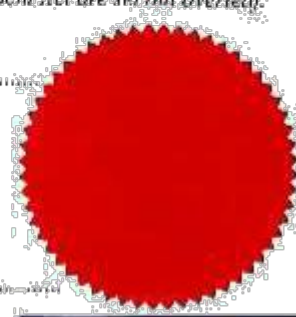
SERENGETI - MARA

Further particulars required by Section 17 of the Tanzania Investment Act are set out overleaf


Executive Director

Tanzania Investment Centre
P.O. Box 938, Dar es Salaam

Dated 12TH AUGUST 2017



Scanned by CamScanner

Appendix 6 Letter from MNRT with respect to Tourism Business License

The United Republic of Tanzania
MINISTRY OF NATURAL RESOURCES AND TOURISM

Tel: 255-26 2321566/2321567
Fax: +255-26 2321514
E-mail: ps@mnr.go.tz



Kilimani Street,
Askari Road,
P.O.Box. 1351
40472 DODOMA.

In reply please quote: GA/305/517/01D

6 September, 2017

Director General
National Environment Management Council,
Regent Estate, Plot No.29/30
P.O.Box 63154, Dar Es Salaam
Tel: +255 222774852
Fax: +255 222774901
E-mail: dg@nema.co.tz or nemetz@yahoo.com

**REF: TOURISM BUSINESS LICENSE FOR KAMAL ALLOYS LIMITED AS
ATTACHMET FOR ENVIRONMENTAL IMPACT ASSESSMENT PROCESS AT
SERENGETI NATIONAL PARK.**

The company mentioned above aim to construct an accommodation facility in Serengeti National Park. Currently the developer is in preliminary stages of construction, and one of the stages is to undergo Environmental Impact Assessment. One of the requirement for the developer to qualify for EIA is to submit Tourism Business License issued under the Ministry of Natural Resources and Tourism as stated by your office.

We advice your good office to allow the developer Kamal Alloys Limited to continue with the EIA process. The following reasons support the advice: (i) Tanzania Tourism Business License (TTBL) is issued to a company which is ready to operate after other process of construction have been completed. (ii) TTBL is one of the conditions when a developer undertakes Environmental Audit. Based on these reasons, we request that the developer Kamal Alloys Ltd be allowed to continue with EIA of the project.

Thank you for your cooperation


Decagrasias J. Mdamu
For: Permanent Secretary

Appendix7: Approval letter for scoping report and Terms of Reference

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)

BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

Telephone: +255 22 2774889,
Direct line: +255 22 2774852
Mobile: 0713608930
Fax: +255 22 2774901
Email: dg@nemc.or.tz
Website: www.nemc.or.tz

35 Regent Street,
P. O. Box 63154
11404 Dar es Salaam
TANZANIA

In reply please quote:

NEMC/HQIEIA103/0249N.1/4

25/4/2017

Kamal Alloys Limited, P.O
Box 10392,
Dar es Salaam.

RE: SCOPING REPORT AND TERMS OF REFERENCE (TOR) FOR THE PROPOSED DEVELOPMENT OF SERENGETI BELABELA LODGE WITHIN SERENGETI NATIONAL PARK IN SERENGETI DISTRICT, MARA REGION.

We acknowledge receipt of your consultant letter dated 12/4/2017 attached with ten copies of the Scoping report and draft Terms of Reference for undertaking an EIA study for the above mentioned project with reference Application No. 6703.

Following the review of the scoping report it has been noted that the ToR are adequate and thus can be used to guide the EIA study. In addition to the approved ToR, observe the following comments;

- Provide detailed description of all project components; and all relevant documents pertaining the project should be appended in the EIS; and
- Appendix 2 on page 37 of the scoping report which is a letter from TANAPA that allow construction of more guest rooms should be provided in a A3 paper size as it is not readable,

Upon submission of the EIS, the Council will arrange for a technical review of the document by the cross-Sectoral Technical Advisory Committee (TAC). Prior to review, representatives of the TAC will visit the proposed project area to inspect the site and verify the adequacy of the EIS. The budget for these review activities amounts to Tanzanian shillings Tshs **22,360,000/=** (see attachment Invoice), Please note that transport for officers to and from the project site is organized by the developer.

Contact us in case you need additional information or clarification on this process through Telephone No, 0683 391978,

We look forward to your continued cooperation on this matter.

~_j

R. Said

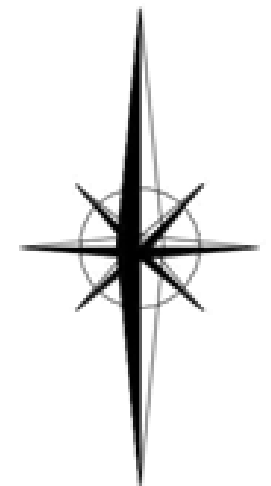
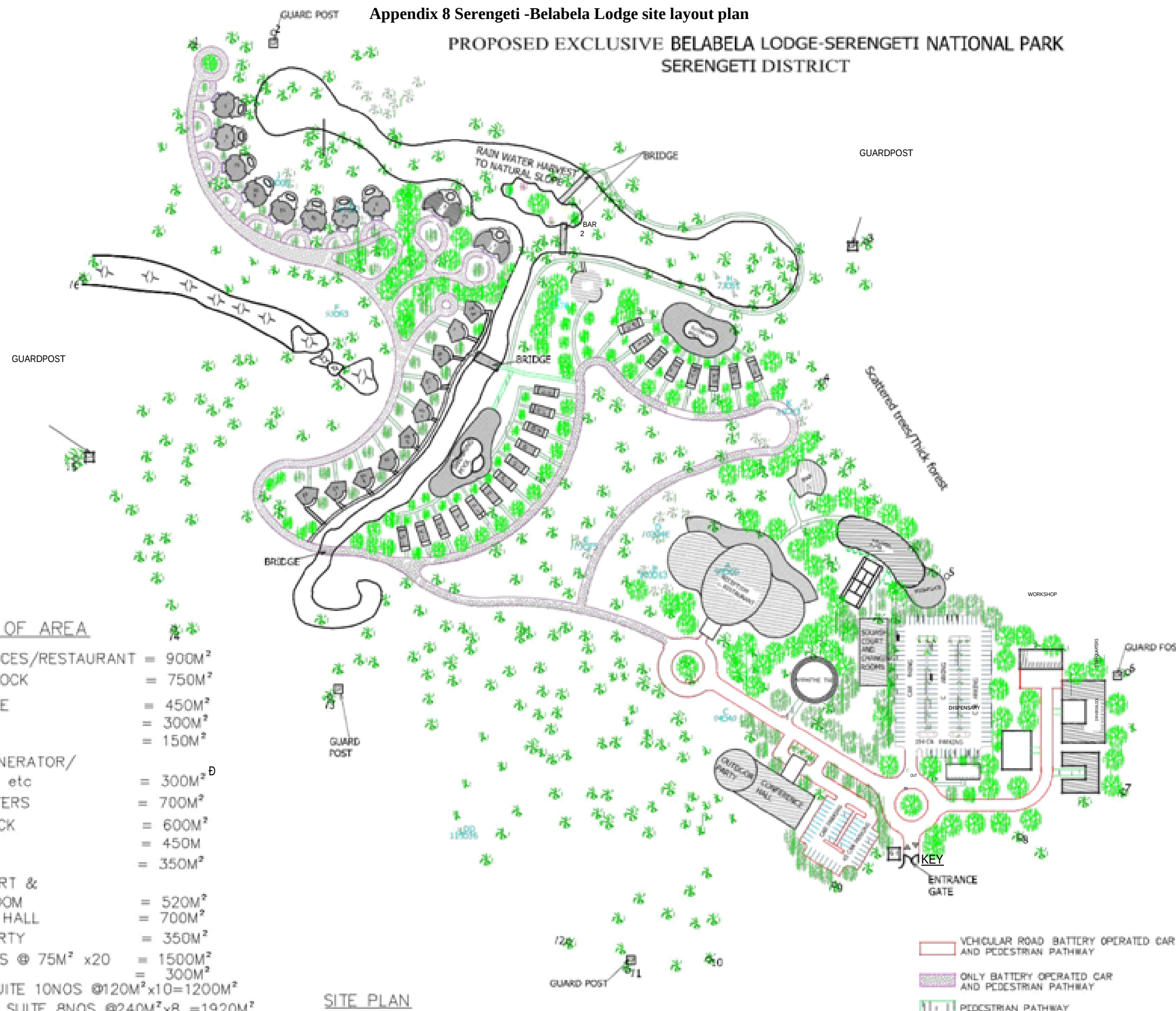
For: Director General

Cc: Dr, Victor Runyoro,
P, O Box 16581,
Arusha.

All correspondence should be addressed to the Director General

Appendix 8 Serengeti -Belabela Lodge site layout plan

PROPOSED EXCLUSIVE BELABELA LODGE-SERENGETI NATIONAL PARK
SERENGETI DISTRICT



REVISION	DESCRIPTION	DATE

CONSULTANTS:

SCALE: 1:2000 DATE: AUG.2017
DRAWN: CHECKED



REPORT ON
HYDROGEOLOGICAL AND GEOPHYSICAL SURVEY FOR
SELECTION OF POTENTIAL SITES FOR DEEP BOREHOLE
DRILLING FOR WATER SUPPLY TO SERENGETI BELABELA
SAFARI LODGE LOCATED AT SERENGETI DISTRICT

MARA REGION – TANZANIA

REPORT NO RT/GWS/VOL 1/9

COMPILED BY:

**P.O. Box 16461, Arusha -
Tanzania.**

Tel: +255 787 345 556

Email: rockteckgroup@gmail.com

March 2016

SUMMARY:

This report describes the results of borehole sites investigation for proposed Serengeti Belabela Safari lodge area, situated at Serengeti District in Mara Region.

The climate of the area is arid to semi-arid with about 500 - 800 mm. of rainfall per year. The calculated potential evaporation (E_o) is between 2160 – 2600.

The project area is underlain by banded ironstones and quartzite overlain by brown sandy soils, and unconsolidated sediments derived from the weathered granites. (Granitic, pebble, cobble and boulders)

Groundwater occurrence within such rocks is restricted to Basement regolith and in jointed/fractured/fissured bedrocks, or in faulted zones. Magnetic and Electrical resistivity methods were utilized to locate favorable sites for drilling, where aquifers were observed to be between 60– 150 meters below ground level.

Recommendations are given for borehole construction and completion methods. The importance of correct and efficient drilling, well design and development cannot be stressed enough, until drilling operation starts.

ABBREVIATIONS AND GLOSSARY OF TERMS.

Amsl	Above Mean Sea Level.
VES	Vertical Electrical Sounding.
M	Metre.
Cm	Centimeter.
Mm	Millimeter.
MP	Magnetic Profiling
GPS	Global/Geographical Positioning System.
BH	Borehole.
Swl	Static Water Level.
TDS	Total Dissolved Solids.
WHO	World Health Organization.
Bgl	Below Ground Level.
Pumping test	A test that is conducted to determine aquifer or well characteristics.
Aquifer	A geological formation or saturated which store and transmit water and which may supply water to wells, boreholes or springs.
Regolith	The loose, incoherent mantle of rock fragments, soils, brown sand, alluvium etc. which rests upon solid rock.
Fault	A fracture or a zone of fracture along which there has been displacement of the sides relative to one another parallel to the fracture.
Recharge	The general term indicating the process of transport of water from surface sources (i.e from rivers or rainfall) to the groundwater.

1.0 INTRODUCTION:

Following the request from the high authority Serengeti Belabela Safari Lodge to the Managing director for RockTech Group and Consultants carrying out the Hydro-geological and Geophysical investigations at BelaBela area, the investigations were undertaken on 6th to 8th March 2016.

The surveys were undertaken with the view of locating potential drilling site for the borehole drilling at the area for both construction purpose and for the proposed Lodge use in the future.

2.0 PRESENT SOURCE OF WATER SUPPLY:

At present there is no any source of water supply to the site as the site is newly selected for the proposed Lodge. The investigation was approached as a multi-step exercise and comprised:-

- (a) A desk study and data acquisition phase.

- (b) A tentative geological field study and geophysical survey
- (c) The compilation, analysis and evaluation of all data gathered, both in the Office and in the field.

3.0 LOCATION OF THE SURVEYED AREA:

Serengeti Belabela Safari Lodge is located about 420 km kilometres north west of Arusha City and located at 2 17'01" S and 34 26' 14" . The coordinates for proposed Camp area are, and falls on topo sheet no. 25/2 (scale 1:50,000) and QDS no. 25 (scale 1:125,000).

4.0 GEOMORPHOLOGY AND DRAINAGE:

Belabela area including the surveyed lodge area is situated on a more or less a hilly at low land and surrounded by mountains and rocks at all parts of the area. The investigated area is recharged by the surrounding mountains and a seasonal stream which flows from south east towards north east .The master slope which is very gentle is to the north. The general elevation of the area surveyed range between 1327 and 1329 m above mean sea level.

5.0 GEOLOGY AND HYDROGEOLOGY:

The area investigated is composed of Nyanzian and Kavirondian geological System, characterized by rock-types like folded bended ironstone, quartzite, sandstones and shale. Fragments of these outcrops (in the form of boulders, pebbles, cobbles and gravels) can be found on low lying valleys around the surveyed area.

The larger crater on the top of hills and existing fragmented rocks on the slopes of hills cause high infiltration rate of atmospheric precipitation into the ground .This water then moves down the slopes radially. The process of groundwater accumulation is enhanced by relative flat terrain of the area surveyed. Ground water occurs under both water table and confined aquifers. The nature of the local geology of the surveyed area which includes coarse sand, gravels, pebbles and cobbles is favorable for ground water storage and movement. However this fact cannot be proved as there is no any productive borehole drilled to the area. Generally no any the most relevant information concerning the productive boreholes at the area as the area is newly proposed for the Serengeti BelaBela Safari Lodge.

6.0 WATER QUALITY:

The quality of surface and groundwater sources at the area is good except high fluoride concentration in some locations.

7.0 GEOPHYSICAL INVESTIGATION METHODS:

7.1 Methodology

A great variety of geophysical methods are available to assist in the assessment of geological sub -surface conditions. In the present survey the resistivity (Vertical Electrical Sounding) and Magnetic Profile method have been used.

7.1.1 Magnetic Profile

The magnetic properties of rocks may affect the earth's magnetic field. The strength of vertical component of the earth's magnetic field is measured and plotted against distance in a graph.

Analysis of the results may indicate qualitatively the depth to bedrock and presence of buried dykes, river channels, faults, fractures, etc, which may influence in groundwater occurrence.

The Magnetic Profiling (MP) was used to detect any anomalous conductive zones in the sub-surface, which might be associated with faulted or fractured zones.

Geophysical survey is essentially the interpretation of the variation in measured response at the surface to certain forces, either natural or artificially generated within the earth's crust. Such variations result from differences in physical characteristics such as density, elasticity, magnetism and electrical resistivity of the underlying layers.

8.0 FIELD WORK AND INTERPRETATION RESULTS:

8.1 Magnetic Profile (MP)

At total number of two (2) MP was conducted around BelaBela area

MP – 1, (GPS Coordinates 0660241, 9748308) covered a distance of 156metre with an interval of 2 meters. The Magnetic anomalous values (fractured/fissured/weathered zones) were detected at 92 meters (station 56) along the Magnetic profile line 1.

MP – 2,(GPS Coordinates 0660211, 9748328) covered a distance of 130 with an interval of 2 meters The Magnetic anomalous values (fractured/fissured/weathered zones) were detected at 100 meters (station 51) along the Magnetic profile line 2

8.2 Vertical Electrical Soundings (VES):-

A total number of two (2) Vertical Electrical Soundings were taken at the area

VES 1 was taken at 92metres across MP 1 and oriented north – south direction. (at the valley GPS Position0660211UTM 9748396Altitude 1327

VES 2 was taken at 100metres across MP 1 and oriented north – south direction. (at the valley GPS Position 0660303UTM 9748307Altitude 1329

The resistivity soundings were carried out using an A.C. ABEM Terrameter 4000 deploying Schlumberger's method of configuration to maximum current electrode separation of 300 meters and potential electrode separation of 50 meters. Magnetic Profiling was done by using Proton Magnetometer GSM-19T v7.0

Interpretation of resistivity curves was done using Tekes software programme in a computer.

Layer resistivity values and their corresponding layer thicknesses as obtained from interpretation of field data are furnished and attached below.

9.0 SELECTION OF BOREHOLE DRILLING SITES:

Considering geological (thick overburden/regolith underlain by thick fractured/weathered basement rocks at the surveyed area), hydro-geological, geo-morphological set up of the area investigated, coupled with resistivity survey results, the following sites are recommended for drilling in order of preference as follows:-

VES1

This site is located at 92m, along MP 1 GPS Position 0660211UTM 9748396 Altitude 1327 at the broad valley.

VES2

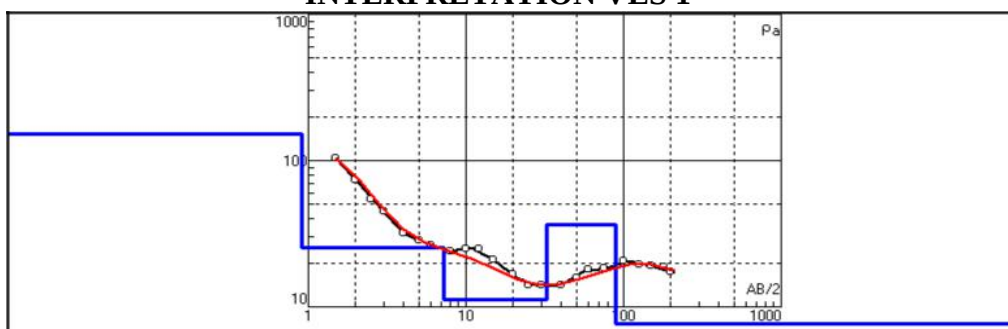
This site is located at 94m, along MP 1 GPS Position 0660303UTM 9748307Altitude 1329 meter, at the broad valley.

10.0 CONCLUSIONS AND RECOMMENDATIONS:

- Geological, hydro-geological, geo-morphological conditions, as well as the results of resistivity soundings favor the occurrence of groundwater (This refers to site of VES 1 and 2)
- Direct mud rotary method of drilling is recommended. Air method of drilling can be applied on encountering fractured/fissured bedrock. The pilot hole should be drilled before any reaming is done. The reaming process can be carried out only when the water is available.
- The recommended depth, diameter and well assembly for borehole to be drilled (site 1and 2) are 150 meters, 20 cm, and 15 cm respectively. However, the final drilling depths can be altered by a site Hydro-geologist depending on the rock strata penetrated, quality and quantity of water struck during the drilling operation.
- Drilling of the borehole, design and installation of well assembly and pumping test should be carried out under supervision of Hydro-geologist or senior hydrogeology Technician.
- Large, clean, well rounded quartz pea-size gravels (2 – 4 mm) should be used in packing the borehole.
- Water from different strikes/aquifers should be chemically analyzed for quality determination at the Water Quality Laboratory
- A concrete slab should be built around the top of the well assembly for sanitary protection. The top five (0 – 5) meters should be cement grouted to avoid pollution of the groundwater in the borehole.
- After construction, the borehole should be fully developed by compressed air until the water becomes absolutely silt free before a production testing of at least 8hours.

NB: The selected sites are marked by wooden peg and known to Mr. Mosses 076255256; a guide from TANAPA-Kirawira Ranger Post and Mr. Spiros 07682672536; a Driver from MAULY TOURS)

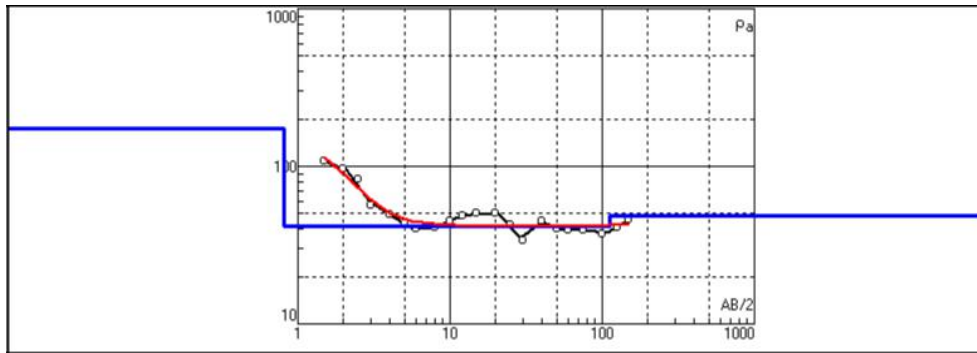
INTERPRETATION VES 1



CURVE AND MODEL

N	p	h	d	Alt
1	152	0.909	0.909	-0.9092
2	25.4	6.33	7.24	-7.236
3	11.2	25.3	32.5	-32.54
4	36.5	56.7	89.2	-89.21
5	7.66			

INTERPRETATION VES 2



CURVE AND MODEL

N	p	h	d	Alt
1	172	0.817	0.817	-0.8166
2	41.6	110	111	-111.3
3	48.3			

Appendix 10: Concerns and opinions of UNESCO

Culture

Director
World Heritage Centre

Sector

Division for Heritage

United Nations
Educational, Scientific and
Cultural Organization

Organisation des
Nations Unies pour
l'éducation, la science
et la culture

Organización de las
Naciones Unidas para la
Educación,
la Ciencia y la Cultura

OpraH-3aL.vo1~

Mr Kassim Chabue Sengoe
P.O. Box 1330
Tanga
United Republic of Tanzania

27 September 2017

Ref.: CLT/HER/WHC/AFR/17/URT/166/SK

Dear Mr Sengoe,

I wish to thank you for your letter of 29 June last to the Country Representative of UNESCO in Tanzania, by which you informed us of the intention of your client, Kamal Alloys Company Limited, to construct and operate the Belabela Tented Camp at Serengeti National Park.

As you are aware, Serengeti National Park has been inscribed on the World Heritage List since 1981. In accordance with Paragraph 172 of the *Operational Guidelines for the Implementation of the World Heritage Convention*, the World Heritage Committee invites the States Parties to the Convention to inform it, through the World Heritage Centre, of their intention to undertake or authorize in an area protected under the *Convention* major restorations or new constructions which may affect the Outstanding Universal Value of the property, as soon as possible and before making any decisions.

Please bear in mind that in such cases, it is standard practice to conduct an Environmental Impact Assessment (EIA) in line with IUCN's World Heritage Advice Note on Environmental Assessment. Moreover the EIA should be submitted to the World Heritage Centre for review by IUCN before any irreversible activities are undertaken.

In line with these provisions, the International Union for Conservation of Nature (IUCN), the Advisory Body to the World Heritage Committee on natural heritage, has reviewed the project brief for the construction of the proposed Serengeti-Belabela Lodge in the Serengeti National Park. For your information, we are enclosing IUCN's analysis, which includes a reference to the 2006-2016 Serengeti National Park General Management Plan (GMP), the most recent management document we have received from the State Party of Tanzania. We will contact the national authorities to request them to submit the new management plan in order to clarify how this project relates to the property's current strategy for tourism management. Should you have any questions, please contact my colleague Ms Susanna Kari (s.kari@unesco.org).

Thanking you for your co-operation and for sharing the relevant information on your client's project.

Enc: Permanent Delegation of the United Republic of Tanzania to UNESCO
UNESCO National Commission
Ministry of Natural Resources and Tourism of the United Republic of
Tanzania
Tanzania National Parks (TANAPA)
UNESCO Office in Dar es Salaam
UNESCO Office in Nairobi
IUCN

Annex 1

IUCN analysis of the Project brief for construction of the proposed Serengeti-Belabela Lodge in the Serengeti National Park World Heritage property

August 2017

IUCN firstly wishes to clarify that on reading the “Project Brief for construction of the proposed Serengeti Belabela Lodge in the Serengeti National Park” (hereby referred to as “Project Brief”), the details of the development differs to that summarized in the cover letter from Mr. Sengoe dated 29 June 2017. The specifics of the Belabela Lodge have been described as follows in the Project Brief:

- Comprises 40 rooms to accommodate 80 visitors;
- High-class lodge (not a permanent tent), with facilities including a swimming pool, spa, gym and restaurant;
- Falls within the "low use zone" according to the Serengeti National Park General Management Plan (GMP);
- In addition to the guest space, there will be further 40 rooms to accommodate 80 employees, and an additional 10 rooms for drivers/guides/ranger;
- 3,000 litres of water will be needed per day during construction phase and an average of 5,000 litres during operation at full occupancy;
- Construction phase will be approx. 12 months, and the operational phase is proposed for an initial period of 25 years;
- Various negative impacts are expected at the pre-construction, construction and operational phases of the project.

IUCN therefore notes that the proposed development, as approved by TANAPA subject to a hydrological survey and an EIA, has been expanded and is relatively large compared to other tourist accommodations in the area. IUCN notes the critical importance of ensuring that a comprehensive EIA has been conducted in line with the IUCN World Heritage Advice Note on Environmental Assessment ([https://cmsdata.iucn.org/downloads/iucn advice note environmental assessment 18 11 13 iucn template. pdf](https://cmsdata.iucn.org/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf)), and submitted to the World Heritage Centre for review by IUCN before any decisions are taken that may be difficult to reverse, in accordance with paragraph 172 of the *Operational Guidelines*. The EIA should address in greater detail, the potential negative impacts the project may have on the OUV of the property, including severity of the impacts and mitigation options.

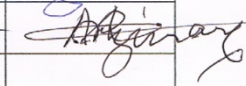
The Project Brief includes a copy of a report on hydro-geological and geophysical survey, but it is unclear whether this is intended to be the hydrological survey requested by TANAPA in its letter to the project proponent dated 20 October 2015 (Appendix I of Project Brief). IUCN supports TANAPA's request on the need for a hydrological survey before the pre-construction phase (i.e. borehole drilling), and considers that such a survey should include an assessment to determine the natural volume of groundwater

flow into the nearby Mbalageti and Grumeti Rivers amongst others, and hence model the potential impact on water resource availability under the current project design. IUCN notes that the Statement of OUV of the property, as adopted by the Committee at its 36th session in 2012 (Decision 36 COM 8E), already noted the scarce water supply for wildlife during dry years, and therefore considers that any activity that may exacerbate the situation be examined carefully. It is therefore the view of IUCN, that the current hydro-geological and geophysical survey report is insufficient in its current form.

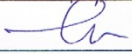
IUCN has also taken note of the description provided in the Project Brief that the project site falls within the "low use zone" according to the Serengeti National Park GMP, which is "designated for the establishment of ecologically and environmentally-friendly lodges and/or tented camps" (page 9 of Project Brief). However, according to the GMP 2006-2016, "the GMP stipulates that only permanent and non-permanent tented camps will be permitted in this zone" (pages v, 54 of GMP). It therefore appears that this high-class lodge is incompatible with the GMP and IUCN recommends that the World Heritage Centre request the State Party to ensure that the project proponent modifies the project design in compliance with the GMP, and in consultation with the World Heritage Centre and IUCN. Such a modified design should be subject to an EIA, in line with the above-mentioned Advice Note. This would also require the State Party to review the overall capacity of the property for overnight- and day-tourists to ensure that the OUV of the property is maintained. IUCN further notes that the proposed location of the project appears to be overlapping with, or very close to, the wildebeest migration route, raising concern over impacts on the migration resulting from an increased and permanent human presence. IUCN therefore recommends that the project proponent identify an alternative location for the project that is further removed from the migration route. In this context, IUCN recommends that the World Heritage Centre request the State Party to ensure that any future proposals for permanent and non-permanent infrastructure development do not interfere with the "unaltered animal migration" as stated under criterion (vii) of the property's Statement of OUV.

Appendix 11 Names and signatures of other stakeholders who were consulted

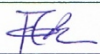
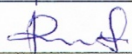
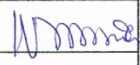
NAMES AND SIGNATURES OF STAKEHOLDERS CONSULTED DURING THE CONDUCTION OF EIA STUDY FOR THE PROPOSED BELA-BELA PERMANENT TENTED CAMP TO BE CONSTRUCTED IN SERENGETI NATIONAL PARK, SERENGETI DISTRICT IN MARA REGION (MARCH, APRIL AND MAY, 2017).

S/N	NAME	DESIGNATION	INSTITUTION	SIGNATURE
1.	William Mwakikoma	CPW	SENAPA	
2.	Adeo Mbugu	TOURISM OFFICER	SENAPA	
3.	Albert Mwangi	SPE	TANAPA	
4.				
5.				
6.				
7.				
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15.				

NAMES AND SIGNATURES OF STAKEHOLDERS CONSULTED DURING THE CONDUCTION OF EIA STUDY FOR THE PROPOSED BELA-BELA PERMANENT TENTED CAMP TO BE CONSTRUCTED IN SERENGETI NATIONAL PARK, SERENGETI DISTRICT IN MARA REGION (MARCH, APRIL AND MAY, 2017).

S/N	NAME	DESIGNATION	INSTITUTION	SIGNATURE
1.	JOSEPH Msimbano	SENIOR TOURISM OFFICER	MNRT	
2.	FRANCIS MOLLER	SPECIAL MANAGER	SERENGETI	
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NAMES AND SIGNATURES OF STAKEHOLDERS CONSULTED DURING THE CONDUCTION OF EIA STUDY FOR THE PROPOSED BELA-BELA PERMANENT TENTED CAMP TO BE CONSTRUCTED IN SERENGETI NATIONAL PARK, SERENGETI DISTRICT IN MARA REGION (MARCH, APRIL AND MAY, 2017).

S/N	NAME	DESIGNATION	INSTITUTION	SIGNATURE
1.	OGADA MARGATI	ECONOMIST	SERENGETI DC	
2.	PRISCA MURIA AG.	DSBO	SERENGETI DC	
3.	JOHN L. MENDAMO	DGD	— 1 —	
4.	WAMBURA SUNDA	DCDO	SERENGETI DC	
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Appendix 12: The Technical Advisory Committee (TAC) comments-Developers response matrix

S/N	TAC Comment	Developer's Response	Section and page (s)
REVIEW AREA 1: Description of the development. Legal framework and local environment and baseline conditions			
1.	The project title should read: The proposed development of Serengeti Belabela Lodge to be located at Msabi Hills within Serengeti National District in Mara Region	The title has been re casted and now reads as advised	Cover page
2.	Provide the section which briefly discusses the project rationale/justification	A section which briefly discusses the project rationale/justification is provided	Section 1.2; page 16
3.	Provide information on design of the mentioned swimming pools, their management, risks associated and management measures	Information on design of the swimming pools, their management, risks associated and management measures are provided	Section 2.2; paragraphs 7 and 8 on 26
4.	On page 24: - Section 2.2; provide an estimation of quantities of construction materials to be used by the proposed project - State the capacity of the staff camp	- Estimation of quantities and cost of construction materials to be used by the proposed project are provided - Capacities of the staff camp for the construction team and during operation phase are provided	- Subsection 2.4.2; Tables 2,3,4,5 and 6 on pages 18-20. - Section 2.2; paragraph 9 on page 26 during operation and Section 2.4(c) on page 29 during construction..
5.	State the distance from core project area to where a borehole shall be drilled	Distance from where a borehole shall be drilled to the core project area is stated	Subsection 2.4.1 (b) on page 29
6.	State types, sources and estimated quantities of waste generation in each project phase and describe the methodology used to make the estimates	Types, sources and estimated quantities of waste generation in each project phase and description of the methodology used to make those estimates have been stated	Subsection 2.4.2 (d) on page 34 for construction phase and Subsection 2.4.3 (e) and (f) on page 39 for solid and liquid respectively during operation phase
7.	Provide the sources of information to cited information presented in the EIS, e g. all figures and tables and baseline information.	Source of information that was not collected by environment experts including that indicated in figures and table has been provided	The whole document
8.	On page 30 (c) provide the specifications of the generator in	Specifications of the generator in terms of capacity, noise and	Subsection 2.4.3 (c); paragraph 2 on page

	terms of noise and emission levels.	emission level have been provided	38
9.	On page 31 (e), • Provide the technology to be used during the burning of solid waste and consider an alternative means instead of using a drum anchored in the ground • Be specific on the final disposal site for solid waste instead of stating either Arusha or Mwanza.	• An alternative technology of burning solid waste instead of using drum anchored in the ground has been provided • Final disposal site shall be Arusha. However, should the proposed new site at Mwanza come into use, it could a dumping area in future as the one at Arusha has progressively become saturated.	• Subsection 2.4.3 (e) on page 39 for burning technology • The whole document for specificity of the dumping location
10.	Provide information on project compatibility with SENAPA General management Plan	Information on project compatibility with SENAPA's 2006-2016 and 2017 draft General Management Plans has been provided	Section 2.1 on page 23 and Subsection 3.2.1 on page 43
11.	Describe the methodology used to obtain baseline information	Methodology to obtain baseline information has been provided	Section 1.6; paragraphs one and four on page 19 and 20 respectively.
12.	Shift information on page 56, section 4.1 (project location) to Chapter two.	Information on location of the project site has been shifted from Chapter four to Chapter two.	Section 2.1 on page 9
13.	Describe baseline information regarding socio-economic activities of the project site.	The project site is located inside remote area within SENAPA, thus there are currently no socio-economic activities taking place	There are currently no socio-economic activities taking place as the site is in the remote area inside the park
14.	Provide the project layout plan preferably on an A3 paper size	The Project layout plan has been provided on an A3 paper size	Appendix 8 on page 113
15.	Discuss health and safety issues in each project phase	Health and safety issues have been discussed in each project site and	Subsection 2.4.2 (f) on page 35 during construction phase and Subsection 2.4.3 (d) on page 38 for operation phase
REVIEW AREA II: Identification and evaluation of key impacts			
16.	Chapter six should read assessment of impacts and identification of alternatives as per EIA and EA Regulations, 2015	Title for Chapter six has been re-casted and now reads as impacts and identification of alternatives	Chapter 6 on page 63
17.	State the methodology used in impacts identification, analysis	Methodology used to identify, analyze and evaluate impacts has	Section.....

	and evaluation	been stated	
18.	Provide the methodology used to predict the magnitude of identified impacts	Methodology used to predict the magnitude of the identified impacts has been provided	Section 1.6, paragraph 8 on page 21
REVIEW AREA III: Impacts mitigation, project alternatives, EMP and commitment			
19..	On page 81; Table 4: • Indicate costs to mitigate the impacts instead of writing “incorporated in the construction budget” • State if the mentioned costs are for annual or throughout the project life	• Cost to mitigate all the identified impacts have been estimated • It is mentioned that cost for mitigation of impacts is annual and the indicated one is for construction phase and first year of project implementation	Section 8.2 indicates that the cost is annual and Table 9 on pages 78-84 shows cost to mitigate all impacts
20.	On page 89; Table 5: Revise the table and complete all information required in each category/column (refer page pages 22-330. Also add a column for target/standard referred	Table 5 has been revised and completed with all required information and a column for target has been added	Table 10 on pages 87-94
21.	Redo the CBA Chapter so as to include the values of ecosystem and environmental services that are likely to be impacted by the project development	The CBA Chapter has been improved and values of ecosystem and environmental services that are likely to be impacted have been included	Section 10.2 on page 95
REVIEW AREA IV; Public participation and presentation of the report			
22.	The preliminary pages should start with roman numbers	Preliminary pages are starting with roman numbers	Page (i)-(xiii)
23.	Remove page number on the cover page	Page number on the cover page has been removed	Cover page
24.	Consultation should be done to UNESCO and the Ministry of Natural Resources and Tourism (as it shows the consultation was incomplete; refer attached letters in the EIS and their views and concerns should be addressed in the re-submitted EIS	• Views and concerns raised by UNESCO and the Ministry of Natural Resources and Tourism have been addressed • Representative of the Wildlife Division of the Ministry of Natural Resources and Tourism was one of the members who visited the site. He supported the project provided all issue recommended in the EIS are adhered too under the guidance and supervision of TANAPA. The Ministry further recommended that EIA process should continue and the Tourism Business License will	Chapter 5, Table 7 on page 55-62 and

		be processed once construction has been completed and operation commenced. • A copy of this EIS has been submitted to TANAPA, which has the mandate to communicate with UNESCO. According to TANAPA's DALP, a lease agreement with the developer is signed on condition that the properties outstanding universal values (OUV) are not compromised. Step 11 of the 16 steps outlined in DALP is the evaluation of the developer's development prospectus and approved EIS by a team of experts with the involvement of UNESCO. Before the evaluation exercise by TANAPA, the final EIS and an operating GMP are normally submitted to UNESCO.	
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