NGORONGORO CONSERVATION AREA AUTHORITY (NCAA)

ENVIRONMENTAL MONITORING PLAN FOR NGORONGORO CONSERVATION AREA (NCA)

April, 2019

FOREWORD

Ngorongoro Conservation Area (NCA) remains to be one of the most renowned tourism destinations in the world with its international reputation as heritage site and the only place in the world where pastoralism, tourism and conservation co-exist. In addition, area embraces several distinct habitats from open grassland to mountain forest and from bush-land to highland heath. The area has a rich biodiversity, hosting a diverse range of wildlife

In order to manage NCA attractive and delicate natural environmental settings, environmental management programs have been prioritized. Environmental aspects and their subsequent environmental impacts are taken into consideration and incorporated by the relevant authorities and investors in order to provide mechanism for sustainability of operations and development projects within NCA. Environmental management measures deemed appropriate for tourism industry has been prepared by NCAA in collaboration National Environment Management Council (NEMC) and will be updated from time to time, to accommodate emerging challenges arising from changes in policy and legislations, new developments as well as technology transformation.

This plan is a tool for environmental management for the tourism industry and other projects operating in NCA. The plan is not only a tool but attempts to highlight the environmental principles and best practices applicable to NCA. It will be reviewed from time to time as necessary and published for the wider tourism industry participation and guidance. It is my sincere hope that this plan provides a useful tool for better environmental management and operations of tourism industry in NCA. I take this opportunity to thank the invaluable cooperation and assistance provided to develop the plan from staff at the National Environment Management Council (NEMC) and Ngorongoro Conservation Area Authority (NCAA) as well as all other individuals who contributed in the preparation of this publication.

Dr. Freddy Manongi
Conservator of Ngorongoro April, 2019

ACKNOWLEDGEMENTS

This work was made possible by the technical contribution from staff at the National Environment Management Council (NEMC)-Northern Zone office in collaboration with the staff from NCAA. Special thanks to the invaluable technical guidance and tireless efforts by Dr. Menan Jangu, Novatus Mushi and Jackson Haule from NEMC as well as NCAA management in making this document possible.

SUMMARY

The NCA is a world-renowned ecologically unique home for both terrestrial and aquatic rare species. This unique ecological niche was impetus for its recognition in the World Heritage List in 1979. It is also recognized globally for its multiple land use type of management that is intended to reconcile interests of tourism, conservation and community development. The natural ecosystem, its flora and fauna, clean air and sense of remoteness are the basis of the expanding, economically important, nature-based tourism industry in the NCA. However, this fragile ecosystem could be damaged irretrievably by insensitive and unplanned development.

This is the Environmental Monitoring Plan for facilities and development projects in NCA developed by NCAA in collaboration with NEMC. The plan also set out aspects for consideration in ecological monitoring by NCA. The NCAA has statutory responsibilities to set policies and standards for the development of tourism in the NCA and evaluating the extent to which tourist facilities incorporate and uphold the environmental policies and standards. The plan will assist the NCAA and investors to fulfill the environmental legal requirements which to the large extent depends on the regular monitoring, thus ensuring ecologically sustainable tourism in NCA. The plan is primarily intended to ensure that all tourist development projects and their operations being old or new maintain quality and reliable services that are ecologically sustainable.

The proposed environmental monitoring plan is in recognition of the importance given by the government on ensuring environmental sustainability of tourism industry in NCA through use of policies, legislations, regulations, and standards for improved environmental conditions. Sustainability of tourism industry depends highly on the ecological integrity of the NCA. Likewise, a successful tourism industry depends on both natural environment and built environments that do not jeopardize the integrity of the ecosystem. Therefore, the monitoring plan will assist ecologists, environmental inspectors and conservationists in developing a broad-based understanding of the status and trends of NCA resources as a basis for making decisions and working with other agencies and the public for the long-term protection of NCA.

The sustainability of the tourism industry and the nation will involve careful planning, management and development. These aspects can be fulfilled if there is regular monitoring of development projects and the ecological function of NCA. The plan briefly discusses the major environmental problems, legal support mechanism and aspects that have to be monitored as well as general guidance on how to conduct monitoring activities in NCA.

In principle, the role of monitoring plan is to facilitate activities such as conducting environmental assessment, promote environmental compliance and enforcement, and to raise awareness on environmental legal requirements. Furthermore, the plan will enable regulatory agencies such as NCAA and NEMC to collect data and information in order to update the environmental status of existing facilities in Ngorongoro Conservation Area, thus be able to describe the state of the environment of the NCA.
The proposed plan is essential in fulfilling the following specific objectives:

i. To collect environmental information on the existing facilities in Ngorongoro Conservation Area.
ii. To determine compliance and non-compliance status oftourist facilities and other development projects within NCA.
iii. To develop and regularly update the state of environment of NCA.
iv. To determine emerging environmental issues that need immediate attention.
v. To promote compliance of the facilities to EMA Cap.191 of 2004 and its regulations through awareness raising.
vi. To undertake legal enforcement actions against non-complaint facility.

The monitoring plan is developed using the existing environmental management practices, institutional and legal framework that incorporates sectoral legislations requirements, and standards relevant in the field of biodiversity, land use, forestry resources, water resources, wetlands, endangered species, and sharing of information.

LIST OF ACRONYMS

AWF:	African Wildlife Foundation
EA:	Environmental Audit
EI:	Environmental Inspectors
EIA:	Environmental Impact Assessment
EMA:	Environmental Management Act
GHG:	Greenhouse Gases
GMP:	General Management Plan
MEM:	Manager for Ecological Monitoring
NCA:	Ngorongoro Conservation Area
NCAA:	Ngorongoro Conservation Area Authority
NEMC:	National Environment Management Council
PC:	Pastoral Council
SEA:	Strategic Environmental Assessment
SWM:	Solid Waste Management
TANAPA:	Tanzania National Parks
WMP:	Waste Management Plan

OPERATIONAL TERMS

In order to address environmental challenges associated with facilities in NCA, some operational terms are given:

Air pollution: The presence in or introduction into the air of a substance, which has harmful or poisonous effects.

Campsite: A designated camping area for erection of tents awning or other temporary structures by guests for dwelling or sleeping purposes and meets the minimum requirements set out by NCAA.

Climate change: Any significant change in the measures of climate lasting for an extended period.

Developer: A person who is developing a project which is subject to an Environmental Impact Assessment process under EMA.

Domestic waste: All solid waste excluding organic kitchen waste. It contains recyclable materials that can be separately collected and recycled/treated.

Ecosystem: A dynamic complex of plant, animal, micro-organism communities and their nonliving environment interacting as a functional unit.

Environmental Audit: The systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing in conserving or preserving the environment.

Environmental Impact Assessment: A systematic examination conducted to determine whether or not a programme, activity or project will have any adverse impacts on the environment.

Environmental Management: includes the protection, conservation and sustainable use of various elements or components of the environment.

Environmental Monitoring System: A system that combines the processes of obtaining, assembling, synthesizing, and reporting repeated and systematic measurements or observations of environmental characteristics.

Environmental monitoring: means the continuous or periodic determination of actual and potential effects of any activity or phenomenon on the environment whether short-term or long-term.

Green wastes: Organic material like grass, leaves, flowers and tree cuttings from site clearing and green area maintenance.

Hazardous waste: Toxic waste, which, because of its composition and quality, has to be treated separately from other waste fractions. The hazardous waste to be treated includes solid waste (such as battery cells) as well as liquid waste like oils and lubricants. Wastewater that contains hazardous materials is also termed as hazardous waste.

Kitchen waste: Organic material from kitchens (food scraps, vegetable and fruit peels, fish and meet rests etc.)

***Mobile camping*:** Camping temporarily in an area that is not designated as a campsite. They are intended to allow visitors for a different experience from that experienced by other tourist, but they are unique in offering a different camping experience desired by other tourists.

Mobile camps: refers to those facilities designed for temporary camping on land.

Operator: In relation to a regulated business, means the person –
a) who for the time being receives, or is entitled to receive, the proceeds of the profits arising from the regulated business; or b) by whom or on whose behalf the regulated business is conducted or is to be conducted, whatever the nature or extent of that person's interest in the business.

Permit: *A* form that is signed by a certain authoritative figure giving permission for an activity to be undertaken or service to be rendered.

Polluter-pays principle: means a mechanism whereby the cost of cleaning up any element of the environment damaged by pollution, compensating victims of pollution, cost of beneficial uses lost as a result of an act of pollution and other costs that are connected with or incidental to the foregoing, is to be paid or borne by the person convicted of pollution under this Act or any other applicable law.

Pollution: means any direct or indirect alteration of the physical, thermal, chemical, biological, or radio-active properties of any part of the environment by discharging, emitting, or depositing of wastes so as to adversely affect any

beneficial use, to cause a condition which is hazardous to public health, safety or welfare, or to animals, birds, wildlife, fish or aquatic life, or to plants or to cause contravention of any condition, limitation, or restriction which is the subject to a license under EMA.

Proponent: means a person proposing or executing a project, programme or an undertaking

Protected area: A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

Sewage sludge: sludge from wastewater treatment system/plant.

Sewage: means a combination of excreta, urine, and sewage and liquid wastes from homesteads, institutional, commercial and industrial processes and operations.

Stakeholder: A person, group or organization that has interest or concern in an organization. In this case it refers to operators, government bodies, the communities and non-governmental organizations.

Standard: means the limits of discharge or emissions established under this Act or under regulations made pursuant to this Act or any other written law.

Tented Camp**:** A place that provides accommodation in permanent tents or other structures with walls of canvas or wood, reeds, grass or other natural material according to the minimum requirements described by NCAA.

TABLE OF CONTENTS

List of Tables

List of Annexes

CHAPTER 1: INTRODUCTION

Tanzania is endowed with diverse landscapes and natural habitats that host diverse species of flora and fauna. These conditions provide the country with unique attraction sites for tourism industry, which is one of the leading sectors for the economic growth, contributing about 17% of the country GDP. Over the years, these attraction sites have become an integral part of the natural resources that support people's livelihood. The survival of these unique natural resources, however, depends on the cohesive efforts of all key stakeholders including regulators, regulated communities, and non-governmental organizations as well as the public.

In recognition of the importance of tourism industry, the government formulated the National Tourism Policy (1999) with the objective to promote the economy and livelihood of the people. It advocates sustainable development and quality tourism that is culturally and socially acceptable, ecologically and environmentally friendly, and economically viable. Consideration for ecological and environmental issues is widely emphasized in the National Environmental Policy (1997), which defines both natural and social concerns and adopts the key principles of sustainable development. Therefore, in making sure that the overall policy objective and specific objectives are attained, concerted effort from governing institutions is necessary to protect and conserve wildlife environment that is a basis of tourism industry.

Ngorongoro Conservation Area Authority (NCAA) is one of the wildlife sector agencies that unlike National Parks, and Game Reserves, that has permitted the coexistence of wildlife and human settlements within its boundaries. The legal establishment of the NCAA as a unit in the Ministry responsible for wildlife conservation was made under the Ngorongoro Conservation Ordinance No.413 of 1959. In 1975, the unit was elevated to an autonomous parastatal organization; the Ngorongoro Conservation Area Authority (NCAA) by the Game Parks Law No. 14 of 1975. The environmental protection and conservation is of paramount importance for NCA, and this function is among mandates given to NCAA that include:

- To conserve and develop the natural resources of the areas;
- To promote tourism within the conservation area and provide and encourage the provisions of facilities necessary or expedient for the promotion of tourism; and
- To safeguard and promote the interests of Maasai citizens of the United Republic of Tanzania engaged in livestock keeping within the conservation area.

There are different kinds of tourism facilities and development projects established in NCA, each having its own environmental impacts. At large, the cumulative impacts generated by these investments can be enormous and hardly reversible. These investments include lodges, hotels, permanent camps, communication and transport

infrastructures, energy supply units, as well as temporary and mobile camps. These facilities in parks have to be regulated due to their environmental impacts and social concerns. However, the questions are: what aspects to be monitored, how, who and when to monitor? The monitoring plan will be used to measure, gather, process, and store, disseminate information as well as in the assessment, and projections of environment conditions.

Lack of necessary tools for the management of the environment poses challenges to the NCAA technical staff in recording trends of stresses and their effects at large. This has complicated the decision making process in achieving long-term protection and conservation of the NCA ecosystem. Understanding the multiple forces affecting the park ecosystem and the consequences of anthropogenic activities is vital for maintaining, enhancing and restoring the ecological integrity of NCA. Necessary environmental measures particularly on compliance and enforcement of the environmental requirements are needed to ensure sustainability of the NCA. However, compliance and enforcement programs will only be effective in the presence of effective monitoring plan that involves use of appropriate tools.

The objective of this plan is to streamline and use an integrative approach in conducting environmental monitoring of the facilities operating in NCA in order to ensure that they comply with the environmental legal requirements. The information obtained from monitoring activities will be used to give guidance/instructions on improving environmental performance of the tourism facilities and other development projects operating in NCA. The plan therefore aims to promote greater compatibility between the goals of tourism activities and environmental conservation.

The monitoring plan will help in establishing scientifically sound information that can guide informed decisions with regards to the current status and long term trends in the composition, structure, and function of park ecosystems. Also the plan can be used to determine how well current management practices are sustaining the NCA ecosystem. Use of monitoring information will help ecologists and other staff at NCAA to improve their ability to manage natural resources, and also confront and mitigate threats to the park using well established legal support mechanism. In addition, the plan will help to detect problems at an early stage and enable action to prevent the possibility of more serious damage in future. The key areas that are the focus of the environmental monitoring plan in NCA tourism industry and other development projects are:

- Physical environment and landscape
- Terrestrial (flora and fauna) and aquatic biodiversity
- Wastes and emissions (including pollutants, wastewater, noise and vibrations)
- Health and safety
- Socio-economic environment

CHAPTER 2: OBJECTIVE AND JUSTIFICATION OF THE MONITORING PLAN

2.1 Purpose of the Monitoring Plan

The purpose of the Monitoring Plan is to ensure effective monitoring of facilities and development projects in NCA thus enabling them comply with the environmental legal requirements as stipulated in EMA, No. 20 of 2004 and other NCAA regulations. In addition, the plan will help staff involved in monitoring activities to assess environmental performance of operating facilities and ecological function of the NCA. Eventually, the plan will help to ensure preservation and protection of the NCA.

2.2 Specific Objectives

Specifically, the Monitoring Plan is intended to fulfill the following:

- To collect environmental information on the existing facilities in Ngorongoro Conservation Area.
- To establish the current environmental status of tourism facilities and development projects.
- To determine compliance and non-compliance status of tourist facilities and other development projects within NCA.
- To develop and regularly update the state of environment of NCA.
- To determine emerging environmental issues that need immediate attention.
- To promote compliance of the facilities to EMA Cap.191 and its regulations through awareness raising.
- To undertake legal enforcement actions against non-complaint facility.

2.3 Scope

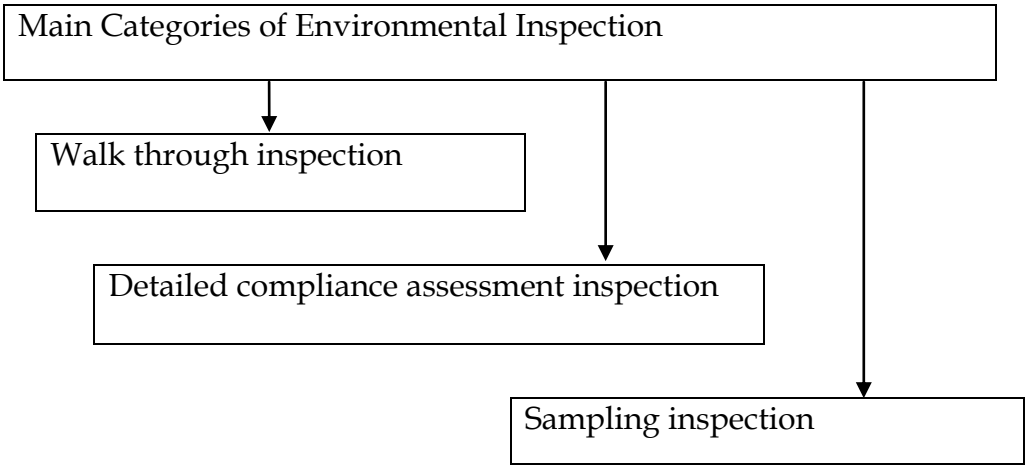
The plan intends to cover all activities in NCA such as lodges; hotels; permanent camps; communication and transport infrastructures; energy supply units; tented camps as well as temporary and mobile camps. Other activities to be monitored include commercial filming; balloon safaris; nature trails and any other activity or facility that may have significant impacts. Aspects for monitoring will include water resources utilization; energy supply systems; landscaping; waste management practices; pollution control systems; invasive species management; material used for construction; rehabilitation and decommissioning programs. Other aspects to be monitored will include health and safety measures; environmental training programs for staff and general housekeeping. This plan is used in conjunction with other environmental legislations and regulations.

2.3.1 Facilities Data Collection Methods

The monitoring plan will involve robust data collection methods that involve the following practices:

i. Physical tour to the facilities and their surroundings, water supply systems, wastewater treatment facilities, and sites for collecting and disposing solid wastes.
ii. An examination of environmental, administrative, technical, and operating records available at the facilities.
iii. Interviews and discussions with key facility management and technical staff.
iv. Photo capturing of respective inspected facilities.
v. Identification of the site location using GPS

The monitoring exercise is governed by intended objectives. However, in most cases inspection/monitoring exercises are categorized as walk through inspection; detailed compliance assessment inspection/monitoring and sampling inspection



2.4 Justification of the Monitoring Plan

Ngorongoro Conservation Area remains one of the world wonders and a great attractive site giving a range of tourism opportunities such as photographic safaris, historical site seeing, enjoyment of Ngorongoro crater view among others. However, the coexistence of multiple activities has created a multiple-stress effect on the ecosystem that is supportive of the wildlife activities. Various activities within NCA have created a wide range of environmental problems. The current tourism investment, and ongoing human activities is now threatening the survival of the NCA and the situation will be worse if environmental measures are not prioritized. Knowing the condition of natural resources in NCA, which protect many of the nation's most pristine and intact ecosystems, is fundamental to the mission for NCAA to manage resources, which are meant to benefit the current and future generations.

The field experience in NCA has revealed that if facilities are unmonitored, they will continue violating environmental laws thus contributing to irreversible environmental damage. The control of such facilities is of paramount importance, and in order to ensure that these facilities are complying with the legal requirements, regular monitoring accompanied by enforcement actions is necessary.

Despite numerous environmental policies and legislations governing tourism facilities operating in NCA, majority of the inspected facilities, however, are not performing well in terms of environmental management i.e. they have not incorporated adequately environmental measures. On the other side, regulators lack necessary tools to guide monitoring and enforcement actions.

There are numerous legal provisions for monitoring facilities in NCA in order to control their impacts. Existing regulatory measures for tourism facilities are fragmented and there are different institutions that have overlap mandates in managing environmental issues. The overlapping mandates and duplications of responsibilities between institutions on environmental issues for tourism facilities are not supportive for integrated management approach. Rather, the overlap of mandates has created conflicts between governing institutions thus causing limited enforcement of the law. Consequently, the mechanisms to ensure effective compliance and enforcement are not adequate. Therefore, this plan has been developed using the existing institutional and legal framework to respond to the environmental challenges experienced in NCA.

2.5 Basis for Environmental Monitoring Plan

Tourism in NCA exists solely due to the unique physical, geographic and ecological features. It is the beauty of the crater that hosts wild animals never seen in any other part of the world, the rich vegetation and ideal tropical climate that attract tourists to the NCA.

Increased levels of awareness and recognition of the importance of nature, environmental protection is a major factor for sustainability in competitiveness in the associated businesses. In the present era, protecting the environment is a basic requirement for any project long-term social recognition and acceptance.

Apart from regulatory authorities, investors in NCA have shared responsibility and commitment to develop a high-level tourism product that competes with the global tourism market. All tourism facilities are obliged to incorporate environmental measures in their business and contribute to sustainable tourism development in the NCA through environment friendly innovative programmes that can be developed without much adverse effects.

Pressure in NCA is increased as a results of country drive on boosting the economy as well as increased number of tourists that has been triggered by increased efforts in destination promotion. A growth in the sector would mean there is a greater need for higher environmental standards and clearer guidelines for sustainability. This therefore requires comprehensive environmental monitoring to ensure investments in NCA do not compromise environmental conditions that support tourism industry in Tanzania and also assuring the ecological systems in NCA remains supportive of wildlife.

2.6 Environmental Impacts

Despite its economic benefits, tourism and its supporting infrastructure in NCA has jeopardized the environmental quality. Environmental impacts caused byfacilities in NCA can be further magnified if regulated communities fail to comply, coupled with weak enforcement by regulatory authorities.

There are numerous environmental problems caused by facilities in NCA. The commonly environmental impacts observed during various inspection by regulatory authorities include: poor solid waste management, littering, land degradation, air and noise pollution, surface and ground water pollution, aesthetic pollution, pollution from hazardous materials such as hydrocarbon oil and sanitizers, introduction of invasive species, wildlife disruption, left behind fire ash, trampling of vegetation, off road driving, poaching, and alteration of natural habitat and animal behaviors. The levels of environmental impacts are determined by the type of investment and the undertakings as well as its intensity at a particular site.

S/n	Impact	Description
1.	Water Resources	Tourism facilities tend to put pressure on freshwater, which is one of the most critical resources needed by wildlife and ecosystems in the conservation area. Furthermore, the available water resources may be subjected to pollution by the wastewater generated from these facilities, hence affecting its water quality.
2.	Depletion of Natural Resources	Tourism development increases pressure on the natural resources particularly in areas where resources are limited. Likewise, forests often suffer negative impacts of tourism particularly on the use of fuel wood and land clearing for projects.
3.	Habitat alteration and fragmentation	Natural habitat is commonly affected by tourist infrastructure. Transportation activities by tourism operations tend to exacerbate the physical impacts e.g. through ecosystem fragmentation. More often, the seasonal camping done by the tourism industry has

		physical damage on the existing ecosystems. The physical impacts will be enlarged by the increased tourism facilities as observed in some areas within NCA.
4.	Pollution	Tourism facilities create air emissions, noise pollution, and solid waste and littering, release of sewage, oil and chemicals, and other problems such as architectural/visual pollution. In addition, noise pollution from cars involved in services of tourism facilities create disturbance to the wildlife as some animals will alter their natural patterns.
5.	Solid waste	Tourist activities are one of the main causes of accumulated solid waste in the conservation and protected area. Poorly managed solid wastes destroy the natural systems such as rivers and scenic area. Solid waste and littering degrade the physical appearance of parks and can cause death to both terrestrial and aquatic organisms (e.g. through ingestions).
6.	Sewage	Establishment of tourism facilities lead to increased volumes of sewage. Poorly managed wastewater in parks pollutes tourist attraction sites, as well as causing damage to the flora and fauna. In addition, sewage pollution is detrimental to the heath of animals in the park.
7.	Aesthetic pollution	Construction of tourism infrastructures in parks diminishes aesthetic appeal of nature. In other words poor design of tourism facilities causes visual pollution. Similarly, increased tourism facilities and their corresponding infrastructures such as roads, number of employees, housing and waste disposal alters the aesthetic view of parks.
8.	Impacts on wildlife	Wildlife is adversely affected by the construction infrastructures and activities. Such impacts include restrictions on wildlife migratory roots, reproductive sites, and feeding areas. In addition, tourism facilities have other effects such as alteration of feeding patterns of animals e.g. through animal feeding by tourists, littering etc.
9.	Physical Impacts	The NCA has different landscapes including mountains, slopes, lakes, wetlands and riversides which are all considered transitional zones with diverse biodiversity. Such landscapes are now threatened by investment interests, since they are attractive to investors and well as tourists and communities living in NCA.

CHAPTER 3: INSTITUTIONAL AND LEGAL REGIME

3.1 Regulatory Setting

The Government of Tanzania recognizes the economic benefits of the national parks, conservation areas, and protected areas thus created institutional and legal framework for environmental management to ensure sustainability. The proposed plan isin line with the existing institutional framework and legal regime of Tanzania.

3.1.1 Regulatory Agencies Relevant for NCA

There are various institutions that directly or indirectly govern tourism facilities and other development projects in NCA. These institutions have varied mandates and responsibilities, which are aimed at protecting the wildlife environment. Some of these relevant institutions and their mandates for protecting wildlife environment include:

S/n	Institutions	Responsibility
1	The Ministry of Natural Resources and Tourism (MNRT)	Mandated to the conservation of natural and cultural resources as well as the development of tourism, safeguarding the biological value of the flora and fauna species, the habitats and cultural sites.
2	Ngorongoro Conservation Area Authority (NCAA)	Established primarily to administer and manage the NCA. It is a parastatal organization established under the Ngorongoro Conservation Area Ordinance No. 413 of1959 charged with ensuring multiple land use there by conserving and developing its natural resources of the conservation area; to safeguard and promote the interests of Maasai citizens engaged in cattle ranching and dairy industry within the conservation area; and promote tourism within the NCA.
3	Tanzania Wildlife Research Institute (TAWIRI)	Its mission is to carry out research on various aspects of wildlife and biodiversity in general, co-ordinate and supervise all wildlife research in the country, advise the Government and wildlife management authorities on sustainable conservation of wildlife resources, and facilitate the involvement of Tanzanians in wildlife research including training.
4	Tanzania	Government agency established to coordinate,

	Investment Center (TIC)	encourage, promote and facilitate investment in Tanzania as well as advise the government on investment policy and related matters.
5	Tanzania Tourist Board (TTB)	Mandated with promotion and development of all the aspects of tourism industry in Tanzania**.**
6	Tanzania Association of Tour Operators (TATO)	Mandated with the responsibility for providing a common and comprehensive position of the tourism industry in its relations with both the government and its institutions in matters pertaining to the formulation of tourism policy, plans and programmes.
7	National Environment Management Council (NEMC)	Established to undertake enforcement, compliance, review and monitoring of environmental impact assessment and in that regard, shall facilitate public participation in environmental decision making, exercise general supervision and coordination over all matters relating to the environment.
8	Internal Drainage Basin Water Board	Management of Water Resources as WRMA, No. 11 OF 2009 provides for all water resources within NCA to be governed by Internal Drainage Basin Water Board. Among others, prepare basin water resources management plans and implementation strategies; provide guidelines and standards for construction and water sources structures; approve, issue, and revoke water use and discharge permits; and monitor pollution and prevention measures.

3.1.2 Legal Regime

The national policies and legislations clearly stipulate various measures/aspects to protect ecosystems in conservation areas in order to ensure that developed projects including tourism facilities incorporate necessary environmental measures. For instance, the Wildlife Policy, 2007 states that: "Wildlife is a natural resource of great biological, economical, environmental cleaning, climate ameliorating, water and soil conservation, and nutritional values that must be conserved. It can be used indefinitely if properly managed." Likewise, the National Environmental Policy, 1997 emphasizes the need to ensure wildlife ecosystems are protected and utilized in a sustainable manner on the basis of a careful assessment of natural heritage in flora and fauna fragile ecosystems, sites under pressure and endangered species, with participation of, and

benefits to, the local communities. These policies also regard EIA as a necessary tool in mitigating environmental problems caused by development projects in parks.

The Tourism policy recognizes that the continued existence of the tourism attractions depends on the proper conservation and sustainable management of the environment. Among the policy strategies is to ensure that tourism development activities are subjected to EIA. EIA is critical as it serves the purpose of establishing environmental impacts and developing mitigation measure to respond to those challenges.

Various legislations stipulate that all developed projects in parks and protected areas require EIA. These legislations emphasize the need to incorporate environmental programs during establishment of the facilities as well as having adequate programs to handle all forms of waste generated. For instance, Sec 65 (2) of EMA stipulates that wildlife resources shall be managed in accordance with the provisions of the legislation relating to wildlife matters. The Wildlife Conservation Act, No. 5 of 2005 directs general management measures on Environmental Impact Assessment (EIA), Wildlife Impact Assessment and Environmental Audit and Monitoring. According to Wildlife Management Regulation section 59, subsection (4) a prospective development and investment activities shall be subject to Environmental Impact Assessment as provided for by the Environmental Management Act.

The plan has been developed based on the relevant policies, legislations as well as regulations as shown in the table below.

S/N	Aspect	Relevant Policy and Legislations
1	Conservation of the Parks	National Environmental Policy, 1997; National Environmental Management Act, 2004; The Wildlife Policy, 2007; The National Tourism Policy, 1999; The Wildlife Conservation Act, 2009; National Forest Policy, Land Policy; Tanzania National Park Policy; Water Policy; The Strategic Environmental Assessment Regulations, 2008; Ngorongoro Conservation Ordinance No 413 of 1959
2	Environmental Monitoring	National Environmental Management Act, 2004; The Environmental Impact Assessment and Audit Regulations, 2005; The National Tourism Policy, 1999; Environment Management (Air Quality) Standards, 2007; Environment Management (Water Quality) Standards, 2007; Environment Management (Soil Quality) Standards, 2007; Environment Management (Solid Waste Management) Standards, 2007

3	EIA/EA studies	National Environmental Management Act, 2004; The Wildlife Conservation Act, 2009; The Environmental Impact Assessment and Audit Regulations, 2005; The National Tourism Policy, 1999; The Water Resources Management Act, 2009.
4	Collection of Environmental Fees and Charges	National Environmental Management Act, 2004; Environmental Management Act (Environmental Inspectors) Regulations, 2011; The Environmental Management (Fees and Charges) (Amendment) Regulations, 2018
5	Management of Liquid and Solid Waste	The National Water Policy, 2002; National Environmental Management Act, 2004; The Water Resources Management Act, 2009; The Environmental Management Act (Solid Waste Management) Regulations, 2009; The Environmental Management (Air Quality Standards) Regulations, 2007; The Environmental Management (Soil Quality Standards) Regulations, 2007; The Environmental Management (Water Quality Standards) Regulations, 2007; The Environmental (Solid Waste Management) Regulations, 2007
6	Environmental awareness Programme	National Environmental Management Act, 2004
7	Sanctions and Enforcement Actions	National Environmental Management Act, 2004 and its Regulations. Relevant rules and regulations applicable to NCA.
8	To control entry into and residence within NCA	Ngorongoro Conservation Area Authority Cap 284 (R.E 2002)

CHAPTER 4: IMPROVING ENVIRONMENTAL MONITORING IN NCA

Addressing problems in NCA caused by tourism facilities requires collaborative effort between NCAA and NEMC as well as other stakeholders. Otherwise, unregulated and unmonitored tourism facilities may lead to irreversible environmental degradation, wildlife depletion and the disruption of the delicate balance of the natural ecosystem in the parks. Established facilities in NCA that contravene with the government investment policies, sectoral policies or existing legal obligations are in most cases socially unacceptable and environmentally unsound. Therefore, established facilities in NCA should adhere to the following:

- Incorporate objectives, goals and purposes that conform with that of the National Environmental policy, Tourism Policy and other relevant sectoral policies and legislations
- Comply with the existing country legislation, regulation and the ratified international conventions and protocols
- Comply with the standards required for equipment, machinery, chemicals, and other products in terms of safety and design, hazard and operability, and strength and durability
- Fulfill Tanzania set standards for effluent and air emissions

4.1 Guiding Principles

The monitoring programme implemented in NCA must be cost-effective, easy to implement and it should assist the NCAA management and decision-makers in gradual improvement of the environment conditions as well as the sustainability of tourism industry.

The basis of a monitoring programme is the collection of baseline data. Therefore, monitoring effectively starts at the beginning of a development project, using baseline data obtained from EIA study. The monitoring programme should develop from the main findings of the initial programme and continue to monitor changes against the baseline.

This plan recognizes that some development projects in NCA were established before the enactment of the EMA No. 20 of 2004, thus lacking baseline data. The legislation however, requires such projects to undergo Initial Environmental Audit (IEA) study in the process of developing mitigation measures. On the other hand, the newly developed projects are required to incorporate precaution principle by incorporating

EIA study. Therefore, the monitoring programme is developed based on the following principles:

i. To have a basis for continual assessment of the environmental impacts of tourism facilities and other development projects in order to proactively develop mitigation measures.
ii. Environmental monitoring fulfills legal mandates of ensuring facilities and other development projects comply with environmental requirements by controlling and improving the project operations.
iii. Environmental monitoring is an integral component of environmental impact assessment and NEMC & NCAA are mandated to conduct environmental monitoring for all projects that are subject EIA and Environmental Audit.
iv. Environmental monitoring is not merely a regulatory process but a voluntary process that help investors in NCA to adopt to green economy.

In addition, there are different measures that require collaborative efforts to abate the impacts of tourism facilities. Therefore, NCAA in collaboration with other regulatory agencies such as NEMC will implement the following aspects to ensure effective environmental management of the facilities operating in NCA.

S/N	Aspect/Objective	Guidelines
1	To Strengthen Environmental Monitoring & Inspections	*Environmental monitoring of the tourism facilities within NCA should be under both NCAA and NEMC since the two authorities are both regulators of environmental issues. However, acknowledging and appreciating the factors of proximity, ability to work and nature of work of the two agencies NCAA should take lead in tourism facilities in their daily operations because such facilities are within the NCAA areas of jurisdiction.*
		NCAA using the designated environmental inspectors will be undertaking inspections in their routine operations and this inspection information should be compiled and communicated to NEMC.
		NEMC in collaboration with NCAA shall continue undertaking both planned and ad-hoc environmental inspections to tourism facilities to ensure for healthy environment in NCA. Information sharing will be key for enforcement since will help in planning for best management of the biodiversity and the general environment in NCA.
		NCAA should also share information such as a list of tourism

		facilities and activities that have been registered in NCA. The information should include temporal and spatial distribution of tourism facilities in NCA.
		NCAA and NEMC should prepare a monitoring checklist for assessing environmental compliance of the proposed tourism projects. This checklist can be used by NCAA during their regular monitoring, however the information obtained can be shared with NEMC for reference and further action.
		NEMC and NCAA should prepare and agree on the contents of Compliance Agreement Form that can be filled when inspecting facilities by both parties (regulator and regulated community) during inspection. The form should have information on non-compliances and timeframe for the regulated community to attend non-compliances. It is also used as a baseline for regulating agencies to sanction those who fail to comply with the legal requirements.
		NCAA in collaboration with NEMC should distribute information to developers that shows their responsibilities on environmental issues.
		NEMC in collaboration with NCAA shall initiate Environmental Audit in respect of any project or undertaking that are likely to have significant impact on the environment.
2	To Strengthen Environmental Enforcement Programs	*Penalty for violations is an approach to ensure negative environmental behaviors are altered, or in other words is a form of deterrence. These penalties can be used to rectify the damage caused to ensure that the environmental damage is rectified.*
		Anyone infringing the provision of the Environmental Management Act or regulations issued pursuant to the Act is mandated to pay fine or to be sentenced to jail as the law requires.
		NEMC and other regulating bodies are mandated to sanctions facilities that do not comply. The sanctions are based on the violations as stipulated in EMA. The sanctions e.g. notice and orders issued to non-compliant facilities should be shared by both parties i.e. NEMC and NCAA.
3	Strengthening and Improving Institutional Regulatory Measures	*NCAA should utilize their resources, authority, and proximity to regularly monitor tourism facilities.*
		Empowering NCAA staff by giving them training on inspection and requesting the Minister of Environment to appoint them as inspectors. NEMC should continue liaising with NCAA on the logistic of provision of regular training for environmental inspectors, as Environmental Inspectors are entitled to access facilities whether they are in operation and to carry out investigations.

		NCAA using their GMP should identify the specific areas for camping. This information need to be shared with NEMC
		NCAA and NEMC should ensure that all developers/proponents operating in the parks have registered their projects and undergone EIA and EA studies accordingly.
		Further studies are required to establish whether the level of investments, number of visitors, residents and livestock is compatible with the carrying capacity of NCA. Otherwise, the continued trend of increased/improved tourism facilities and infrastructures is putting more pressure on the ecosystems that contributes to the conditions such as soil erosion, increased pollution, natural habitat loss and threatening wildlife species and general environment.
4	Raising Environmental Awareness Among Developers/Proponents	*Tourism facilities are a key part to the environmental management programs instituted by agencies such as NCAA and NEMC. Investing in education and awareness programs to support existing regulations as well as encouraging positive environmental behaviors is essential in protecting wildlife environment. Engagement of investors in awareness program may increase the consciousness of the value of nature and lead to compliance behaviors and related activates to improve environmental conditions. Awareness programs should be aimed at making investors stewards of environmental protection and conservation measures. The idea is to encourage tourism facilities to incorporate principles and practices that are aimed at minimizing environmental impacts. Awareness programs should also include aspects such as NCA's rules and regulations and other national laws and regulations, EIA requirements, waste management practices, adherence to environmental quality standards.*
		NEMC shall prepare Environmental Monitoring Guidelines that will be provided to NCAA designated environmental inspectors.
		NEMC shall prepare brochure that will show environmental requirements to be fulfilled by the investors of tourism facilities
5	Improving Environmental Financing Mechanisms for Effective Monitoring	*Payment of the annual fees is a statutory requirement. The annual fees and charges is according to the Tanzania Environmental Management Act No. 20, 2004 and its regulation made under section 230 ((2) (b)) of 2018. The Environmental Management (Fees and Charges) (Amendment) Regulations 2018 prescribe the fees and charges payable for accessing or receiving services rendered by NEMC under the act and the Regulations made there under. These fees based on the Polluter Pay Principle and are collected by the National*

	Programs	*Environment Management Council (NEMC).*
		The developers of these facilities have to pay the statutory environmental fees and charges as stipulated amount in the Environmental Management (Fees and Charges) (Amendment) Regulations, 2018. NEMC and NCAA will agree on the modality of collecting these fees and charges of facilities in NCA.
6	Adhering to Voluntary Environmental Programs such as EMS and Cleaner Production Technologies	*NCAA should encourage design of facilities that are energy-efficient, non-polluting, and sorting of wastes before disposal. Proponents are encouraged to use alternative sources of energy that are environmentally friendly such as solar energy systems.*
		NEMC and NCAA should commend facilities that have initiated self-environmental programs such as use of solar energy, water harvesting, and sorting of waste before taken to designated disposal sites.
7	Enforcing EIA/EA Studies for Investors	*Both NCAA and NEMC should emphasize the need for conducting EIA for projects in parks. The submission of the project briefs to both NEMC and NCAA should be used to determine the kind of EIA study needed.*
		To ensure effective self-compliance NEMC and NCAA should collaborate in disseminating information on the need for EIA/EA and its economic, ecological, sociological and environmental importance.
8	Ensuring Effective Programs to Management of Solid and Liquid Wastes	*Due to its proximity, NCAA should ensure developers of tourism facilities have proper methods of managing their solid waste including collection, sorting, transportation, and disposal. A system can be created in collaboration with NCAA that a designated collection point of waste is identified for all public/private facilities, and the amount for transporting to designated dumpsite outside the conservation area be paid by responsible investors. Glass bottles can be taken to glass recycling plants.*
		NCAA should ensure that no solid waste is disposed of in parks; rather it should be collected and transported to the nearby sanitary landfill and dumpsites outside parks.
		The facilities must have proper/effective waste water containment systems. Alternatively, developers have to secure best available technologies for the management of wastewater
8	Strengthening and Improving Institutional	*NCAA should utilize their resources, authority, and proximity to regularly monitor tourism facilities.*
		Empowering NCAA staff by giving them training on inspection and requesting the Minister of Environment to appoint them as inspectors. NEMC should liaise with NCAA on the logistic of provision of regular training for environmental inspectors, as Environmental Inspectors are entitled to access facilities whether

	Regulatory Measures	*they are in operation and to carry out investigations.*
		NCAA using their GMP should identify the specific areas for camping. This information need to be shared with NEMC
		NCAA and NEMC should ensure that all developers/proponents operating in the parks have registered their projects and undergone EIA and EA studies accordingly.

CHAPTER 5: THE ENVIRONMENTAL MONITORING PLAN

5.1 NCAA Monitoring Plan

This plan sets out steps for doing inventory, setting location, reporting, attending environmental anomalies, providing guidance to investors and NCA residents, staff training and other appropriate management systems to minimize the risk of environmental pollution and ways to respond to them. The existing monitoring plan prepared for NCAA will be reviewed and updated, as necessary, to reflect the requirements of all facilities and other undertakings in NCA. The successful implementation of this plan will assist in minimizing potential effects to wildlife habitat and the environment. In addition, the developed checklists (i.e. Annex 1 and Annex 2) are meant to assess the compliance behavior of investors and status of facilities in NCA from time to time.

Monitoring helps to detect problems at an early stage and enable action to prevent the possibility of serious damage in future. The basic requirements for existing and future monitoring programmes in the tourism sector in NCA are based onfive (5) key areas, which are:

i. Physical environment and landscape
ii. Terrestrial (flora and fauna) and aquatic biodiversity
iii. Wastes and emissions (including pollutants, wastewater, noise and vibrations)
iv. Health and safety
v. Socio-economic environment

These areas separately tabulated below provide issues for consideration during monitoring works.

5.1.1 Physical Environment and Landscape

A meaningful and operationally environmental monitoring that encompasses biodiversity shall include physical environment and landscape as indicators for monitoring. Therefore, these indicators will provide NCAA with the proper guidance in monitoring changes happening on physical environment and landscape. Specifically, parameters for monitoring are shown in table 1.

Table 1: Physical Environment and Landscape Monitoring Considerations

Impact Area	Data Sought	Min. Frequency	Purpose
Vegetation cover	• Vegetation maps • Land use maps • Land cover change maps • GIS or overlay maps	Seasonal (dry and wet)/Yearly basis	• To protect wildlife environment • To avoid impact on aesthetic quality of NCA
Rangeland	• Sighting data • Transect sign data • Land use maps • Land cover change maps • Assessment of rangeland health condition	Seasonal (dry and wet)/Yearly basis	• To avoid impairment of the rangeland health • To monitor human, livestock and wildlife use in rangeland areas • To control encroachment in NCA rangeland
Soil	• Soil-water moisture • Soil erosion • Soil salinity	Seasonal (dry and wet)/Yearly basis	• To understand the soil quality and its support on vegetation
Surface water hydrological flow and sedimentation	• Quantity of water abstracted • Water level • Water velocity • Turbidity • Total Suspended Solids (TSS) • Bed-load • Sediment deposition and substrate	Every six months	• To assess the quantity and quality of water, whether it fulfills the requirements in NCA • To assess the nutrient loading in water bodies
Fragmentation of different land types	• Aerial reconnaissance survey • Average size of	Biennial	• To avoid impact on aesthetic quality of NCA as well as loss of

	coherent units		biodiversity

5.1.2 Terrestrial and Aquatic Biodiversity

A health terrestrial and aquatic biodiversity provides a number of ecosystem services that maintains the NCA biodiversity. In addition, the impacts of introducing alien or imported species into the existing landscape and vegetation of the NCA may be quite significant. Thus, it is very important to monitor the changes terrestrial and aquatic biodiversity in order to assess the provision of ecosystem services in NCA.

Table 2: Monitoring of Terrestrial and Aquatic Biodiversity

Impact Area	Data Sought	Min. Frequency	Purpose
Terrestrial wildlife (large mammals)	• Changes in numbers, composition and distribution of species • Species dominance types in an ecological community	Seasonal (dry and wet)	• To assess species trend and shift in areas within NCA
Grassland/forest	• Estimated cover/abundance • Aerial survey of vegetation structure and height of ach stratum • Dominant species • Catchment size	Yearly basis	• To ensure continued supply of ecosystem services
Aquatic species composition and diversity	• Species numbers, composition and distribution • Species density	Yearly basis	• To assess species trend and shift in areas within NCA
Alien/invasive species control	• No. of species controlled • Types of control methodology used	Yearly basis	• To control rate of alien and invasive species • To improve habitat for

	• Frequency of applied control system		indigenous species • To protect wildlife and livestock in NCA
Existing major trees	• Number and distribution of species • Quadrant survey	Yearly basis	• Protect existing species
Native fauna characteristics	• Number of fauna species • Species diversity (woodland, wetland, grassland and forest)	Yearly basis	• To understand the habitat characteristics of native fauna

5.1.3 Wastes and Emissions

The tourism industry generates the largest amount of wastes in the NCA. Waste management and disposal has been identified as one of the key environmental challenges of tourism development in the NCA. Appropriate mechanisms for effective disposal of waste can only be designed when accurate and useful data on the types and methods of disposal and especially impacts of waste have been collected over a useful period of time. Monitoring can also provide policy and decision makers with the necessary information on health risks involved in inappropriate waste disposal to the ecosystem, guests and the general community of Maasai living in NCA.

Table 3: Wastes and emissions monitoring considerations

Impact Area	Data Sought	Min. Frequency	Purpose
Littering and garbage disposal	• Quantity and types of waste • Method of disposal • Frequency of disposal • Soil quality	Regular records	• Reduce impacts of waste entering into NCA • Protect the wildlife environment

Hazardous waste	• Quantity and type • Disposal methods • Frequency of disposal	Regular records	• Reduce safety risks and health risks from inappropriate handling and disposal
Wastewater /Effluent discharge effects	• Physical quality (pH, TDS, TSS, BOD, COD, Colour, Temp, Conductivity etc) • Biological quality (coliforms) • Chemical quality (Cl, SO_4, NO_3, PO_4, Ca, Mg, CO_3, K, Na, Al, Fe, Cr, Ammonium, Hydrocarbons, etc) • Leaks in sewerage systems • Waste oil and lubricants • Oil handling areas • Pesticides use and handling	Every six months	• Avoid nutrients build up in soil, surface and groundwater to improve landscape • Improve aesthetic appeal of the NCA
Sludge management	• Sludge handling and disposal	Every six months	• Control pathogens • Control odors • Protect ecosystems • Reduce health risks
Atmospheric emissions	• Use of fossil fuels • Air quality (especially particulates)	Once a year	• Reduce air pollution and cumulative impacts on global climate change and foster healthy environment

5.1.4 Health and Safety

Health and safety risks in NCA can be a result of either natural, human or wildlife attacks. Some of the human caused hazards include fuel, chemical and waste handling; and fires. Therefore, identification and monitoring of potential health and safety hazards can help minimize risks. In addition, the interactions between humans, wildlife and livestock may cause zoonotic diseases.

Table 4: Health and safety monitoring considerations

Impact Area	Data Sought	Min. Frequency	Purpose
Accidents/ incident	• Number of fatalities caused by wild animals • Incidence of accidents • Number of fatalities caused by road accidents • Number of fatalities caused by jet/balloon accidents • Number of injuries caused by road accidents • Number of injuries fatalities caused by jet/balloon accidents • Number of injuries caused cuts and burns	Regular records	• Reduce incidents/accidents • Understand safety and eliminate or reduce risks
Training/ Awareness	• Number of safety training sessions • Number of awareness sessions	Regular records	• Promote health and safety
Fire safety	• Number and frequency of fire detection systems detections	Regular records	• Reduce the risks of fire in the

	• Frequency of refilling fire extinguishers		conservation area
Safety equipment	• Number and types of equipment • Frequency of equipment inspection and maintenance	Regular records	• Provide safe working environment for staff
Food safety	• Inspection against TFDA compliance	Every three months	• Ensure health and safety of guests

5.1.5 Socio-cultural and Economic Issues

One of the key aspects of ecotourism development or sustainable tourism management is the contribution that tourism businesses make towards social and community development. Therefore, investors must be able to demonstrate their contribution towards social and community development through written records of economic contributions and awareness creation.

Table 5: Socio-economic condition monitoring considerations

Impact Area	Data Sought	Min. Frequency	Purpose
Community development	• Financial contributions • Community involvement • Number of activities done with communities	Facility records	• Communities will accept tourism more readily • Promote sustainable growth of tourism
Community awareness	• Number of awareness/training sessions • Number of participants • Participants responses/comm	Facility records	• Communities that are aware tend to improve business conditions • Help community to comply

	ents • Assessment of variables		
Cultural tourism	• Cultural events • Events to which cultural events and activities are included	Facility records	• Help promote cultural tourism

CHAPTER 6: ENVIRONMENTAL CHEKLIST

The checklist below identifies aspects for monitoring tourism facilities operating in NCA. Non-compliances to the mentioned aspects may lead to environmental problems. The checklist is meant to assist environmental inspectors as well as individuals involved in monitoring exercise to assess environmental performance and compliance status of the facilities operating in NCA. The checklist contains a number of potential aspects of tourism facilities that have to fulfill the environmental legal requirements. However, depending on the site specifications of the project, the user of the checklist should be aware that other aspects not appearing on the list may be included during inspections

Two types of forms:

1. Detailed version which entail comprehensive assessment of compliance behavior of a facility (Annex 1)
2. Simplified Version to establish at glance the environmental status of a facility (Annex 2)

Annex 1: Detailed environmental monitoring checklist for monitoring of facilities in NCA

	Facility Name			
	Facility Type	Lodge		
		Seasonal Camp		
		Permanent Camp		
		Semi-Permanent		
		Public Camp Site		
		Trade Center		
		Communication Towers		
		Others (Specify)		
	Location	*Place:*	*Capacity (No. of Beds)*	
		GPS Coordinates:	*Inspection Date*	
	Number of Rooms		*Number of Staff*	
	Time in		*Time Out*	

S/N	ASPECTS	OBSERVATIONS	(* Means in each category tick(✓)where appropriate)				
i.	Legal Requirements	• EIA certificate in place [Certificate No. and date issued]	Yes	*	Certificate Type:	EIA	
						EA	
					Certificate No.		
					Date of issuance:		
			No	*	Recommendations given!		
		• General and specific conditions on EIS addressed accordingly	Yes	*			
			No	*			
		• Environmental policy in place	Yes	*			
			No	*			
		• Environmental self-audit conducted and report submitted to relevant authorities	Yes	*			
			No	*			
		• Implementation of Environmental	Excellent	*			

		Management Plan [EMP]				
			Good	*		
ii.		•	Fair	*		
			Bad	*		
			Worse	*		
			Recommendations given!			
		• Personnel and Committee responsible for Environmental issues	Available		*	
			Not available		*	Any recommendation!
		• All relevant permits in place	Yes	*		
			No	*	Identify the missing permits/licenses i. ii. iii.	

					iv.
iii.		• System to document environmental issues in place	Yes	*	
			No	*	
iv.	Buildings	• Building material consideration for color and reflection	Excellent		*
			Good		*
			Fair		*
			Bad		*
			Worse		*
			Any recommendation for improvement!		
		• Built/rehabilitated environment according to the GMP requirement	Yes		*
			No		*
		• Built/rehabilitated environment according to the EIA/EA certificate conditions	Yes		*
			No		*
		• On-site sanitation and sewerage system in place	Yes		*
			No		*

v.		• Fire safety measures in place	Yes		*
			No		*
		• Access roads	Excellent		*
			Good		*
			Fair		*
			Bad		*
			Worse		*
			Any recommendation for improvement!		
vi.	Voluntary Environmental Management Systems	• Has the facility adopted any of environmental systems e.g. EMS 14001 or cleaner technologies	Yes		*
			No		*
		• Is there structure to implement the adopted systems?	Yes		*
			No		*
vii.	Energy systems	• Use of Charcoal	Yes	*	Source:
					Quantity(kg/tonne):

			No	*	
		• Use of Firewood	Yes	*	Source:
					Quantity(kg/tonne):
			No	*	
		• Are there alternative technologies for renewable energy resources?	Yes	*	
			No	*	
		• Are records on the energy use in place?	Yes		*
			No		*
viii.	Air Pollution/smoke and dust	• Is there self-monitoring program for emissions	Yes		*
			No		*
		• How often the testing is conducted?	Annually		*
			Bi-annual		*
			Quarterly		*
			Monthly		*
		• Conformity to Tanzania set standards	Yes		*
			No		*

ix.		• Are the self-monitoring reports for air quality submitted regularly to the relevant authorities	Yes	*
			No	*
		• Are there measures to control emissions?	Yes	*
			No	*
x.	Noise Pollution	• Levels of noise pollution	Acceptable	*
			Not Acceptable	*
		• Measures to control noise pollution available	Yes	*
			No	*
		• Self-monitoring programs for noise levels in place	Yes	*
			No	*
xi.	Water access	• What are source of water	Natural spring	*
			NCAA supply	*
			Borehole	*
			Rain harvest	*
		• Amount of water used per day (lts)	0 – 1000 lts	*

			1001 – 5000 lts	*
			5001 – 10,000 lts	*
			10, 001 – 50,000 lts	*
			>50,000 lts	*
		• Measures in place to optimize use of water	Yes	*
			No	*
		• Water extraction permit in place	Yes	*
			No	*
		• Records for water usage in place	Yes	*
			No	*
xii.	Waste water and water pollution	• What are the sources of waste water?	Kitchen	*
			Laundry	*
			Toilet	*

			Bathroom	*
			Car wash	*
			Other (specify)	*
		• Quantity of wastewater generated per day	0 – 1000 lts	*
			1001 – 5000 lts	*
			5001 – 10,000 lts	*
			10, 001 – 50,000 lts	*
			>50,000 lts	*
		• Self-monitoring programme reports for wastewater •	Yes	*
			No	*
		• Methods used to manage wastewater generated	Septic – soak away pit system	*
			Sewerage Treatment Plant (STP)	*
			French – drain /drainfield	*

			Other (specify)	*
		• Efficient of the available waste water management system	Excellent	*
			Good	*
			Fair	*
			Bad	*
			Worse	*
xiii.	Storm water drainage systems	• Presence of storm water drainage system	Yes	*
			No	*
		• Drainage system clean and not clogged	Yes	*
			No	*
		• Program to clean and maintain storm water in place	Yes	*
			No	*
xiv.	Oil spills and containment	• Presence of oil containment (interceptors) systems	Yes	*

xv.		•	No	*
		• Management of oil spills	Excellent	*
			Good	*
			Fair	*
			Bad	*
			Worse	*
xvi.	Solid waste management	• Quantities of solid waste generated per week	0 – 1,000kg	*
			1001 – 2,500 kg	*
			2,501 – 5,000 kg	*
			5,001 – 10,000 kg	*
			>10,000 kg	*
		• Available receptacles for waste handling	On site dump sites	*
			Transfer stations	*
			Other	*
		• Management of solid waste	Sorting	*
			Recycling	*
			Recovering	*
			Reuse	*
			Disposal	*
		• Are there specific handlers of solid waste	Yes	*
			No	*

xvii.	Light pollution	• Use of recommended light at the facility according to the legal requirements/GMP	Yes	*
			No	*
xviii.	Presence of invasive species	• Facility surrounding free of invasive species	Yes	*
			No	*
xix.	Chemical and hazardous material handling, storage and waste	• Material Safety Data Sheet for all chemicals in place?	Yes	*
			No	*
		• Are the chemicals used registered by the GCLA?	Yes	*
			No	*
xx.	Occupational Safety (Health, Safety and Environment)	• PPEs issued to Workers on a regular basis	Yes	*
			No	*
		• Use of PPE enforced	Yes	*
			No	*
		• Good hygienic conditions?	Yes	*
			No	*
		• Does the facility have safety signs and assembly point	Yes	*
			No	*
		• How often is the medical examination for workers conducted?	Annually	*
			Bi-annual	*
			Quarterly	*
			Monthly	*
xxi.	Control of fire	• Procedures in place to control fire outbreak	Yes	*
			No	*
xxii.	Staff awareness and training programs	• How often are the workers trained on issues related to health, safety and the environment	Annually	*
			Bi-annual	*
			Quarterly	*
			Monthly	*

		• Training records kept and accessible to the enforcing agencies	Annually	*
			Bi-annual	*
xxiii.	Social consideration	• Relationship between the management of the facility and local communities	Excellent	*
			Good	*
			Fair	*
			Bad	*
			Worse	*
		• Services are offered by the facility to the local community	Employment	*
			Educational support	*
			Health support	*
			Water and sanitation support	*
			Financial support	*
			Other	*
		• Existing conflicts between the management of the facility and the local community	Yes	*
			No	*
xxiv.	General housekeeping and access road and path	• Facility outside cleanliness in good condition	Yes	*
			No	*
		• The facility is in good condition according to the set standards/GMP	Yes	*
			No	*
xxv.	Conflict with other parties	Are there issues of concerns/conflicts with authorizing/enforcement agencies	Yes	* Specify:

			No	*	
xxvi.	Payment of Environmental Fees and charges	• Does the facility adhere to the legal requirement of paying statutory annual environmental fees and changes?	Yes		*
			No		*
		• Records of payment in place?	Yes		*
			No		*

Annex 2: Simplified version of environmental monitoring checklist for facilities in NCA

Part 1: General Information

	Facility Name			
	Facility Type	Lodge		
		Seasonal Camp		
		Permanent Camp		
		Semi-Permanent		
		Public Camp Site		
		Trade Center		
		Communication Towers		
		Others (Specify)		
	Location	*Place:*	*Capacity (No. of Beds)*	
		GPS Coordinates:	*Inspection Date*	
	Number of Rooms		*Number of Staff*	
	Time in		*Time Out*	
	Project Stage/Status During Inspection			

Part B: Observations

Inspection Aspects/Items	**Implemented**		**N/A**	**Remarks**
	Yes	**No**		
Environmental Certification				
1.1. EIA certificate in place and valid				
1.2. Are conditions of the certificate complied with? (check the monitoring records and observe physically)				

1.3. Is the EMP adequately adhered to?				
1.4. Is the annual audit implemented and report submitted to relevant authorities				
1.5. Is the payment of annual statutory fees paid accordingly?				
1.6. Are the other permits and licenses in place and valid				
1.7. Others (please specify)				

2. Water Pollution Control				
2.1. Are water discharge permits in place and valid?				
2.2. Are the water use permits in place and valid				
2.3. Are conditions of the permits compiled with? (check the monitoring records and observe physically)				
2.4. Is the wastewater being treated?				
2.5. Is the wastewater treatment system being used and properly maintained on site?				
2.6. Are there any wastewater discharged to the storm drains?				
2.7. Is the public road/area around the site entrance and site kept clean and free of muddy water?				
2.8. Is domestic water directed to septic tanks?				
2.9. Others (please specify)				

3. Waste Management				
3.1. Is the site kept clean and tidy? (e.g. litter free, good housekeeping)				
3.2. Are separated labeled containers / areas provided for facilitating recycling and waste segregation?				
3.3. Are construction wastes / recyclable wastes and general refuse removed off site regularly?				
3.4. Are construction wastes collected and disposed of properly by licensed collectors?				
3.5. Are chemical wastes, if any, collected and disposed of properly by licensed collectors?				
3.6. Does chemical waste producer license covers all major chemical wastes produced on site?				
3.7. Are chemical wastes properly stored and labelled?				
3.8. Are oil drums and plants/equipments provided with drip trays?				
3.9. Are drip trays free of oil and water?				
3.10. Is there any oil spillage? Clean-up the contaminated soil immediately?				
3.11. Is litter, foam or other objectionable matters in nearby water drain/sewer cleaned?				
3.12. Others (please specify)				

4. **Noise Control**				
4.1. Are the noise levels within acceptable levels?				
4.2. Do air compressors and generators operate with doors closed?				
4.3. Is idle plant/equipment turned off or throttled down?				
4.4. Any noise mitigation measures adopted (e.g. use noise barrier / enclosure)?				
4.5. Are silenced equipments utilized?				
4.6. Are the workers in noisy environment provided with protective equipment such as ear plugs				
4.7. Others (please specify)				

5. Air Pollution Control				
5.1. Are the construction sites watered to minimize dust generated?				
5.2. Are stockpiles of dusty materials covered or watered?				
5.3. Are all vehicles carrying dusty loads covered/watered over prior to leaving the site?				
5.4. Are demolition work areas watered? (e.g. trimming activities by using breaker)				
5.5. Are dusty roads paved and/or sprayed with water?				
5.6. Are dust controlled during percussive drilling or rock breaking?				

5.7.	Are plant and equipment well maintained? (any black smoke observed, please indicate the plant/equipment and location)				
5.8.	Is dark smoke controlled from generators?				
5.9.	Are there enclosures around the main dust-generating activities?				
5.10.	Are speed control measures applied? (e.g. speed limit sign)				
5.11.	Others (please specify)				

6.	**Storage of Chemicals and Hazardous Materials (HM)**				
6.1.	Are chemicals stored and labelled properly?				
6.2.	Does storage of HM comply with license conditions (include types and quantities if HM store is available, check the HM store license)?				
6.3.	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)				
6.4.	Are spill kits / sand / saw dust used for absorbing chemical spillage readily accessible?				
6.5.	Others (please specify)				

7.	**Protection of Flora, Fauna and Historical Heritage**				
7.1.	Are disturbance to terrestrial flora minimized (e.g. plants to be preserved)?				

7.2.	Are disturbance to terrestrial fauna minimized (if rare species identified)?				
7.3.	Any historical heritage exists on site? If yes, ensure appropriate measures taken to preserve it				

8. Resource Conservation					
8.1.	Is water recycled wherever possible for dust suppression?				
8.2.	Is water pipe leakage and wastage prevented?				
8.3.	Are diesel-powered plants and equipments shut off while not in use to reduce excessive use?				
8.4.	Are energy conservation practices adopted?				
8.5.	Are metal or other alternatives used to minimize the use of timber?				
8.6.	Are materials stored in good condition to prevent deterioration and wastage (e.g. covered, separated)?				
8.7.	Are pesticides used under the requirement of Agriculture, Fishers and Conservation Department?				
8.8.	Others (please specify)				

9. Emergency Preparedness and Response					
9.1.	Are fire extinguishers / fighting facilities properly maintained and not expired? Escape not blocked / obstructed?				
9.2.	Are accidents and incidents reported and reviewed, and corrective & preventive actions identified and recorded?				

9.3. Others (please specify)				

10. Additional observations and remarks	

NB:
A mark recorded for an aspect or item as "No" represents non-compliance, and thus requires mitigation measures. Details of non-compliances are included in "Remarks" column. The proponent shall identify factors contributing to the non-compliances and submit to NCAA and NEMC the action plan for mitigation. Follow-up inspection will assess implementation of the directives given.

Name of the Inspector _____ Date _____

Signature _____ _____

Name Project
Manager/Representative _____ Date _____

Signature _____ _____

SUMMARY AND CONCLUSION

Tourism is the biggest industry in Tanzania and it has significant effect on the environment as well as on economy and society as a whole. Balancing between economic development and environmental protection is daunting task. Tourism is characterized by people's movement and accommodations in hotels and lodges. In other words tourism creates condition for generation of waste that affects the same environment supportive of the tourism business. Sustainable tourism development can be achieved when good environmental principles and polices are applied. In addition, the success of environmental programmes entails continuous monitoring to assess the performance of such tourism facilities. Therefore, this document is a tool with necessary information for inspectors, monitors in conducting environmental monitoring as assessment of facilities operating in NCA.

REFERENCES

URT. 2010. Ngorongoro Conservation Area: General Management Plan 2006 -2016. Ministry of Natural Resources and Tourism, Dar es Salaam Tanzania

URT. 2008. The Environmental Management (Fees and Charges) Regulations (2008). Dar es Salaam, Tanzania

URT. 2005. The Environmental Impact Assessment, Regulations, (2005). Dar es Salaam Tanzania

URT. 2004. Environmental Management Act. (2004). Dar es Salaam, Tanzania

URT. 1998. The Wildlife Policy of Tanzania, Ministry of Natural Resources and Tourism, Dar es Salaam, Tanzania

URT. 1997. National Environmental Policy. Vice President's Office, Dar es Salaam, Tanzania