The United Republic of Tanzania

Ministry of Infrastructure Development
Tanzania Airports Authority

Feasibility Study and Detailed Design for The Rehabilitation and Upgrading of Shinyanga Airport

Final Design Report
Environmental Impact Assessment

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Issue and Revision Record

Rev	Date	Originator	Checker	Approver	Description
0	July 08	Belva	KC		Preliminary Submission
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EXECUTIVE SUMMARY

1 Introduction

The Government of Tanzania through the Tanzania Airports Authority is undertaking a feasibility study and detailed engineering design for the rehabilitation and upgrading of the Shinyanga airport, located in Shinyanga Municipality, Shinyanga region. The project is part of a larger project being undertaken by Tanzania Airport Authority involving rehabilitation and upgrading of high priority commercial airports across the country. Tanzania Airport Authority has commissioned two companies M/S Sir Fredrick Snow & Partners Limited of UK in association with Belva Consult Limited of Tanzania to undertake Feasibility Study, Detail Engineering Design, Preparation of Tender Documents and Environmental and Social Impact Assessments of seven airports including Arusha, Bukoba, Kigoma, Tabora, Mafia Island, Shinyanga and Sumbawanga.

This report presents the Environmental Impact Assessment of the Rehabilitation and construction of Shinyanga airport, to be implemented in Shinyanga municipal in Shinyanga region. The Objectives of the Environmental Impact Assessment are to identify and investigate in detail the most significant environmental impacts resulting from rehabilitation and construction and use of Shinyanga airport.

2 Approach and Methodology

The EIA is to be undertaken following the Tanzania environmental assessment procedures. Environmental Impact Assessment and Audit Regulations, 2005, First Schedule, categorize construction, expansion or rehabilitation of airports and airstrips and their ancillary facilities as projects to which a full Environmental Impact Assessment is mandatory. Field visits were conducted and public consultations were held with representatives of communities around the project area from 30th March to 3rd April, 2008.

3 Description of the Project

The airport is situated within Shinyanga Municipality (between 3°20' and 3°45' South and 33°20' and 35°35' East), about 17.5 kilometres from Shinyanga town centre at Ibadakuli area. The project site can be reached by way of the Shinyanga - Mwanza road; Nzega/Kahama – Shinyanga road and the Dar es Salaam – Mwanza central railway line.

A 2.5 km access gravel road to the airport branches from the Shinyanga – Mwanza road. Shinyanga airport is 152 km distance from Mwanza and about 1,200 km Dar es Salaam.

Currently Shinyanga airport has a single 2000m x 30m runway, a taxiway and a small apron all gravel surfaced. The project will involve upgrading the airport (runaway, taxiway and Apron) to bitumen surface and the design aircraft is ATR 72.

4 Legal Framework

National policies and legislations relevant to the environment in relation to airport rehabilitation and construction have been considered.

5 Public Consultations

Communities around the project were involved from preliminary studies through organised stake holder's consultation. The stakeholders were very eager to know when the construction of the airport will start and among many issues raised, the following main concerns inclined on the negative side of impacts were presented;

- Effects of vibrations from heavy aircrafts to nearby buildings.
- Official airport boundary to be defined.
- Prohibited activities on airport ground.
- Disposal of waste.
- Official airport boundary

6 Environmental Impacts and Recommended Mitigation Measures

Rehabilitation and upgrading of Shinyanga airport is viewed as a positive aspect in regional development. Many of the negative impacts can be avoided or minimised to acceptable levels. Positive impacts as well as the negative impacts likely to emanate from the rehabilitation and upgrading of airport have been identified. Impacts include those which affect the biological and socio-economic characteristics and the physical environment.

Positive impacts of the airport include improved regional transport, impact tourism and impact on the socio-economy of the project area.

Negative impacts of the project include s, depletion of natural resources, Contamination and impaired quality of receiving body (land and water), damage to rehabilitated structures due to ineffective storm water drainage and overflows, Visual impacts / Public health hazards, Health hazards/disturbances and nuisance to offsite receptors, Destruction of vegetation cover/loss local biodiversity from vegetation clearance and loss of jobs as among many others.

Many of the negative impacts can be avoided or minimised to acceptable levels while positive impacts or benefits derived from the project can be enhanced by adopting good engineering practices and appropriate mitigation measures during design, construction and use of the airport. Therefore mitigation measures have been presented in this report.

7 Environmental Management Plan

The objectives of the Environmental Management Plan (EMP) are to describe the legislative and administrative frameworks in the country on Environmental Impact Assessment Management, implementation arrangements for the EMP, environmental monitoring programme and reporting arrangements. The executing agency of the airport project is Tanzania Airport Authority to be assisted by the Consultant in the implementation of the project. To minimize the potential environmental impacts, the project will require the support of various institutions as outlined in the actions of the EMP.

An Environmental Management Plan (EMP) has been developed to implement the proposed environmental protection measures during construction, operation and decommissioning of the project. It supports the EMP by maintaining a record of environmental performance and enabling adjustments to be made to mitigate environmental and socio-economic impacts during the lifetime of the project.

8 Conclusions and Recommendations

Reconstruction of Shinyanga airport is essential for the development of the economy of Shinyanga municipal and Shinyanga region in general. It is the consultant (Belva Consult Limited and Sir Fredrick Snow & Partners Limited) opinion that the environmental impacts identified may be mitigated. The proposed environmental management plan and environmental monitoring plan if implemented will safeguard the integrity of the environment.

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AMSL	Average Mean Seal Level
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
HIV	Human Immunodeficiency Virus
ICAO	International Civil Aviation Organization
RESA	Runway End Safety Area
SEA	Strategic Environmental Assessment
SIA	Social Impact Assessment
SIDO	Small Industry Development Organization
STD	Sexual Transmission Diseases
TAA	Tanzania Airport Authority
TANESCO	Tanzania Electric Supply Company
TTCL	Tanzania Telecommunication Company Limited
WHO	Word Health Organizations

1. INTRODUCTION

The Government of Tanzania through the Tanzania Airports Authority is undertaking a feasibility study and detailed engineering design for the rehabilitation and upgrading of the Shinyanga airport, located in Shinyanga Municipality, Shinyanga region. The project is part of a larger project being undertaken by Tanzania Airport Authority involving rehabilitation and upgrading of high priority commercial airports across the country. As part of the feasibility study, Tanzania Airport Authority has commissioned two companies M/S Sir Fredrick Snow & Partners Limited of UK in association with Belva Consult Limited of Tanzania to undertake Environmental Impact Assessment of seven airports including Arusha, Bukoba, Kigoma, Tabora, Mafia Island, Shinyanga and Sumbawanga.

Shinyanga airport has a single 2000m x 30m gravel surfaced runway, a taxiway and a small apron both gravelled. The project will involve upgrading the airport (runaway, taxiway and apron) to bitumen surface and the design aircraft is ATR 72.

The Environmental Impact Assessment is to be undertaken following the Tanzania environmental assessment procedures. Environmental Impact Assessment and Audit Regulations, 2005, First Schedule, categorize construction, expansion or rehabilitation of airports and airstrips and their ancillary facilities as projects to which a full Environmental Impact Assessment is mandatory. This report presents scooping activities undertaken from 30th March to 3rd April, 2008.

1.1 SCOPING

Objectives of scoping were to ascertain key issues that are likely to be important during Environmental Impact Assessment; to identify and involve all stakeholders in the Environmental Impact Assessment process by expressing their views and concerns; and specifically to identify project alternatives; Environmental Impact Assessment study boundaries; and to define the Terms of Reference for the Environmental Impact Assessment study. Method for Stakeholders involvement included: one-to-one discussions, stakeholders consultation meeting and public meetings. Notices were posted at strategic points, mainly at Tanzania Airport Authority offices, Regional Secretariat offices, District Commissioner, District Executive Director etc. Field activities were

undertaken from 30th March to 3rd April, 2008. Various stakeholders and communities around the project site were involved in the preliminary studies. The many issues raised are detailed under chapter 5.

1.2 OBJECTIVES OF THE ENVIRONMENTAL IMPACT ASSESSMENT

Part IV of the Environmental Impact Assessment Regulations of 2005 provides the general objectives for carrying Environmental Impact Assessment, namely:

- To ensure that environmental considerations are explicitly addressed and incorporated into the development decision making process;
- To anticipate and avoid, minimise or offset the adverse significant biophysical, social and relevant effects of developmental proposal;
- To protect the productivity and capacity of natural systems and ecological processes which maintain their functions;
- To promote development that is sustainable and optimises resources use and management opportunities;
- To establish impacts that are likely to affect the environment before a decision is made to authorise the project; and
- To enable information exchange, notification and consultations between stakeholders;

1.3 METHODOLOGY OF THE STUDY

The study followed the guidelines provided in the Environment Impact Assessment and Audit Regulations, G.N. No. 349, 2005 for Identifying, collecting and analysing information which included:

- **Baseline Data and Stakeholders Involvement**

Extending the activities that were started by the scoping study including involvement of key stakeholders and collecting baseline data on both natural and built environment including socio-economic conditions of the proposed project area, mainly from secondary sources including:

- Project documents: 1996, M/S M-Konsult (T) Ltd & M/S Scott Wilson of United Kingdom, 20 Airports Study; and Terms of reference provided by Tanzania Airport Authority.

- Tanzania policies, laws and regulation (chapter 3 of this report)
- ICAO regulations & other safeguarding documents: Minimum distance requirements, etc.
- Environmental characteristics Bukoba Municipal and Kagera Region environmental and socio-economic profiles, demographics (population data and household survey data) from the Bureau of Statistics, Planning Commission etc.
- Climate and meteorological data from Met stations,
- Maps: land use, topographical maps, etc

Site visit activities involved making physical observations and taking measurement of the existing structures and determine their functions in relation to the airport.

- **Impact Assessment**

Impact Assessment was done by superimposing project facilities onto the existing environmental conditions of the project site. This involved analysis of data for identification, prediction and evaluation of foreseeable impacts, both beneficial and adverse, of the proposed investment using checklists, simple matrices and expert judgement; and reference to standards and guidelines.

The impacts identification methodology used consider all the potential impacts using a standard matrix approach which takes into account impacts on the physical environment (e.g. air quality, soil and ground water quality), impacts on the ecology (e.g. flora and fauna) and, impact on the human socio-economic setting, as shown in Table 1. The assessment considers contribution to local and national environmental and socio-economic issues as well as global environmental issues of air quality.

Table 1.1: Matrix of Impact Identification

Project Activity								
	Physical environment		Ecological environment			Socio-economic setting		
	e.g. Air quality	Fresh water quality	Flora	Fauna	Other ecosystem components	Social	Economic	Cultural
Project Phase								
Activity I								
Activity II								
etc.								

The Consultant used the general criteria, listed below, to evaluate significance of the identified impacts.

a) Magnitude and likelihood of impact to occur
b) Spatial and temporal extent
c) Potential to implement mitigation measures and controls
d) Likelihood and degree/timescale of environmental recovery
e) Value of the affected environment/social component
f) Level of public concerns
g) Political repercussions of the project

The scales of negative and positive impacts that are likely to occur were determined using a range of low, medium and high:

a) L+ = Low positive
b) M+ = Medium/moderate positive
c) H+ = High positive
d) L- = Low negative
e) M- = Medium/moderate negative
f) H- = High negative
g) O = No apparent impact

- **Mitigation Measures and Management Controls**

Identifying and proposing mitigation measures that aim at eliminating or minimising the potential negative impacts and promote positive ones using expert judgement.

- **Environmental Management Plan and Environmental Monitoring Plan**

Preparing the Management and Monitoring Plans for ease of reference and follow ups during project implementation.

- **Environmental Impact Statement**

Presenting the information which involved writing the Environmental Impact Statement (EIS).

2. PROJECT BACKGROUND AND DESCRIPTION

2.1 PROJECT BACKGROUND

Shinyanga airport was initially constructed on 1985 when the regional airport was shifted from Mwadui area to Ibadakuli area. It has gone a number of maintenances and the last major maintenance was on 2005.

2.1.1 Location and Size

The Airport is situated within Shinyanga Municipal about Seventeen kilometres from Shinyanga municipality centre. The airport constitutes a single 2000m x 30m runway; a taxiway and apron all gravel surfaced, terminal building, fire building, car park, airport manager office.

2.1.2. Accessibility

Shinyanga airport be accessed by road from Mwanza-Shinyanga road, which is tarmac road of good conditions connecting Shinyanga region with Mwanza region. It is about 164 Km from Mwanza to Shinyanga. Also from Nzega- Kahama-Shinyanga road, the road is tarmac of good condition. By air from Tabora and Dar es salaam.

2.1.3 Capacity

At present Shinyanga airport is frequently used only by aircraft of general aviation. The largest aircraft at present is ATR 42. The airport is operational all year but accommodates daytime flights only. There are scheduled flights. Precision air, Charter companies and Government planes use the airport infrequently. The airport generally caters for domestic traffic - business-people and normal population. Table 2.1 shows traffic levels during the last four years.

Table 2.1: Aircraft Traffic Volume of Shinyanga Airport

Year	Aircraft movements			
	2003	2004	2005	2006
Number of aircraft	1,485	1,704	1,459	1,143

Source: Tanzania Airport Authority Headquarter

2.2 MAJOR PROJECT COMPONENTS

The project will involve upgrading the airport (runaway, taxiway and apron) all to bitumen surface. To meet the requirements of the upgrading programme some of the existing structures will be rehabilitation, while others will be expanded. According to current design plan, main components under the upgrading program will include:

2.2.1 Runway

The existing runway will be upgraded to be of tarmac level. No extension will be taking place on either side of the runway.

2.2.2 Taxiway

The proposed taxiway will be allocated parallel the existing runway, but will be within the existing airport premises.

2.2.3 Apron

Apron will be constructed similarly to the runway and taxiway.

2.2.4 Other support facilities and services

The project will continue to use of existing airport facilities including outer buildings, car park, security, fire services and Metrological station. The only structure included under the upgrading programme is storm water drainage.

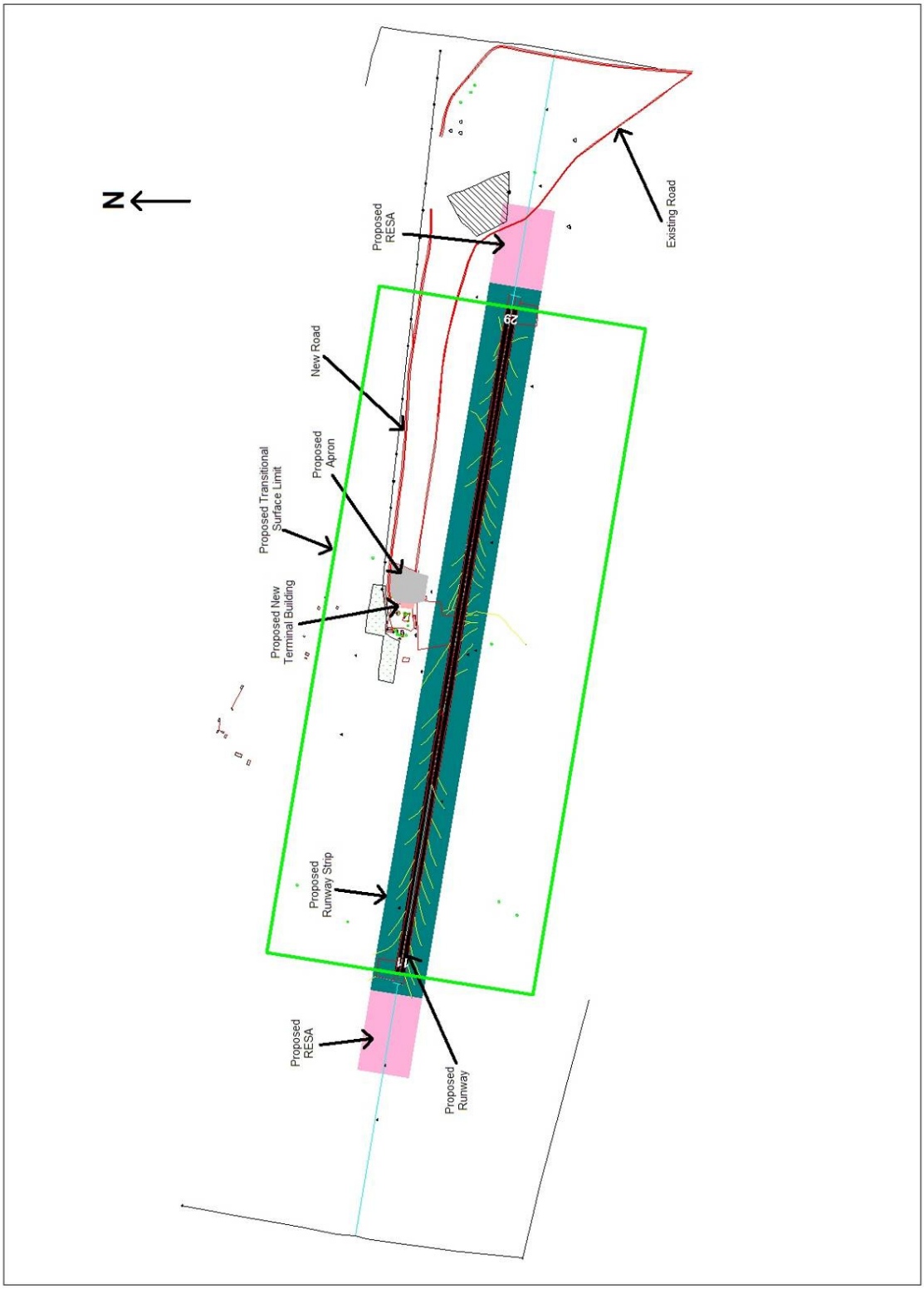

Figure 2.1: Proposed Upgraded Airport Location Plan.

2.3. PROJECT ACTIVITIES

The rehabilitation and upgrading activities will be according to conventional engineering scheduling, procedures and practices.

2.3.1 Site Selection Phase

2.3.1.1 Rehabilitation of Existing Structures

Activities will be confined only to the runway, apron and taxiway, while other areas and structures within the airport will be retained in their current state.

The airport will remain open throughout the duration of the rehabilitation works which are estimated to take eighteen months. To achieve this, construction will be scheduled in a way that enough runway length is available for current design plane to land.

2.3.1.2 Land Takes For New Extensions

If the project is implemented as per current designs, the runway length will remain the same. But according to the design aircraft, more clearance is required which is of 75m from the centre line of the runway on both sides. However, the airport will be extended to include land within the ownership of the Tanzania Airport Authority. No existing land uses will be affected.

2.3.2 Mobilization Phase

2.3.2.1 Site Preparation Activities

Site preparation at existing structures will involve shifting of the exiting road to the new proposed alignment; extension of RESA on both ends of the runway and the following activities will take place:

- Clearance of vegetation and removal of top soil by using motor grader machine.
- Disposal of overburden (cleared vegetation and topsoil) and rubble at Ibadakuli borrow pit
- Construction of new fence

2.3.2.2 Mobilization of Construction Materials and Equipments

1. Sources of Materials

The project will require various standard construction materials including gravel, aggregates, sand, bitumen and water. An estimated 15,000 m3 of granular material will be required up to completion of the project. They will be obtained from private owned quarry site, located at Usanda area in Shinyanga region, about 40 km from the airport. Gravel, about 12,250 m^3 will be obtained from the Ibadakuli burrow pit about 0.1 km from the airport.

Bitumen, 1,900 tons will be purchased in Dar es Salaam or Mwanza, and Water (estimated amount of 2,000,000 litres) will be obtained from the nearby Ibadakuli dam. At the quarry site and burrow pits, the materials will be excavated by excavator and wheel loader machine and loaded into trucks.

2. Equipment and Machinery

The project will employ various standard construction equipments; table 2.2 shows equipments which will be employed by the project.

Table 2.2: Major Equipment to Be Used for Implementation of Project

S/N	Type	Function	Duration (Month)	Source (Hire, Contractor etc.)
1	Excavator	Mobilization	3	Contractor
2	Wheel loader	Mobilization	3	Contractor
3	Trucks	Mobilization	3	Contractor
4	Motor grader	Mobilization	3	Contactor
5	Excavator	Construction	24	Contractor
6	Wheel loader	Construction	24	Contractor
7	Trucks	Construction	24	Contractor
8	Motor grader	Construction	24	Contractor
9	Compactor	Construction	24	Contractor
10	Asphalt plant	Construction	24	Contractor
11	Crasher	Construction	24	Contractor
12	Excavator	Construction	24	Contractor

3 Transportation

The materials from the local burrow pits will be transported by trucks. Most construction equipments are available locally and some will be shipped from abroad.

4 Storage

Materials will be used immediately after delivery. On site workshop will be within the airport area, storage of materials to be used for construction and others will be within the airport area, also services and repair facilities.

5 Construction Crew

This will include a total of 25 skilled and semi-skilled personnel and about 180 labourers who will be hired locally. There shall be temporary construction adjacent to the airport. Accommodation of senior staff will be in Shinyanga town, junior staff will be on camp site while for labours will be from their homes, since will be residence of Shinyanga.

6. Local Supplies and Services (food, medicals, fuel, water etc.)

Food supplies will be from the local suppliers. Medical supplier will from local registered medical practitioner. Fuel will be supplied from local Shinyanga fuel station and water for construction will be from Ibadakuli dam and for human consumption will be from Shinyanga Urban Water Supply and Sewerage Authority.

2.3.2 Construction Phase

1. Construction of Sub-base

In case the existing runway will be used, the sub base will be constructed on the extended part only and the existing runway wearing course will be used as sub base and base course. But if the new runway is to be opted the following activities will take place:

- Site preparation (clearance of vegetation and top soil)
- Shaping to the required shape and size
- Importation of gravel material and spreading
- Watering and compaction of imported gravel material

2. Construction of Base course

Upon completion of the sub-base (both at existing structures and new extensions), gravel will be dumped on the compacted surface, spread, watered and compacted using usual construction practices.

3. Construction of wearing course

The construction of the wearing course will be by using bitumen concrete, which is the mixture of aggregate and bitumen in the specified ratio. The mixing process always done by using asphalt plant which may be placed on the quarry site or at the construction site.

4. Associated works and Finishing

- New markings
- Runway edge and end/threshold lights

2.3.3 Operation Phase

Upon completion, airport operations will resume and main activities related to the upgraded areas will only involve monitoring, periodic maintenance of the runaway and associated areas. The TAA has an airport Maintenance Unit which is under Directorate of Technical Services, lead by director and assisted by number of engineers.

2.3.4 Decommissioning phase

Two scenarios that can happen in the future:

1. Major rehabilitation and/or upgrading which could involve dismantling and erection of new runaway and/or outer buildings.

2. Development of a completely new airport at a new site.

3. POLICIES, LEGAL AND INSITUTIONAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT OF THE PROJECT

Location, deign, mobilization, construction/installation, operation and decommissioning of the proposed project components and its associated support services will have both positive and negative impact on the ecological and social environment. On one hand, Tanzania Airport Authority needs to ensure that during the entire life cycle of the project it complies with relevant national polices, legislations and standards in Tanzania. On the other hand, there are international agreements and/or conventions to which Tanzania is a Party. These also need to be considered during project construction and operation.

3.1 NEED FOR ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment is one of the planning tools which are used to facilitate and promote sustainable development by integrating environmental consideration in the decision making process and ensuring that unnecessary damage to the environment is avoided and optimises resources use and management opportunities. Due to the importance of Environment Impact Assessment, most sector policies and legislation have incorporated the requirement of undertaking Environmental Impact Assessment prior to the implementation of development projects.

The following sections will discuss relevant sector policies and legislation to the proposed project:

3.2 POLICIES

The following are relevant sectoral and cross–sectoral policies which provide directives on how projects should be implemented in relation to concerned environmental and socio-economic settings. The project proponent will consult these policies in the course of designing and implementing the proposed project activities.

3.2.1 National Environmental Policy (1997)

National Environmental policy highlights sustainable development as its core concept. National Environmental policy states that Tanzania is committed to sustainable development in the short-, medium- and long-term. Chapter 4, Paragraph 64 of the NEP

states that "*It is in the context of an EIA regime that policy guidance on choices to maximise long-term benefits of development and environmental objectives can be revealed and decided upon.* Environment Impact Assessment *as a planning tool shall be used to integrate environmental considerations in the decision making process in order to ensure unnecessary damage to the environment is avoided*". The policy also advocates public consultation in carrying out Environment Impact Assessment. Specifically paragraph 66 states that "One of the cornerstones of the Environment Impact Assessment process will be the institution of public consultations and public hearing in the Environment Impact Assessment procedures". The policy recognises the importance of promoting use of environmentally sound technologies that protect environment based on careful assessment of the carrying capacity of the environment. By carrying out this Environmental Impact Assessment, Tanzania Airport Authority has complied with the policy.

3.2.2 National Investment Promotion Policy (1996)

The National Investment Promotion Policy encourages protection of environment in line with the countries socio-economic policies. Under the policy, investors are required to undertake activities in a manner that best contributes to consumer and environmental protection. The investors are also encouraged to use local raw materials/components where possible. This Environment Impact Assessment is undertaken to ensure that Tanzania Airport Authority will abide to the relevant provisions of the policy to ensure compliance with the development.

3.2.3 The Tanzania Development Vision (2025)

The National Vision 2025 foresees the alleviation of widespread poverty through improved socio-economic opportunities, good governance, transparency and improved public sector performance. These objectives not only deal with economic issues, but also include social challenges such as education, health, the environment and increasing involvement of the people in working for their own development. The thrust of these objectives is to attain a sustainable development of the people. Rehabilitation of Shinyanga Airport will contribute towards realisation of the Vision's objectives.

3.2.4 National Policy on HIV/AIDS (2001)

National HIV/AIDS policy provides the general frame work for collective and individual response to HIV/AIDS pandemic. It clear outlines the pertinent issues in struggle. These include among others, roles of various sectors, roles in the preventions, care and supports in HIV/AIDS.

3.2.5 National Transport Policy (2003)

National transport policy, aims at enhancing transport safety and environmental protection, through taking steps to review and update national legislation in transport operations and safety requirements.

3.2.6 National Land Policy (1996)

The National Land Policy advocates the protection of land resources from degradation for sustainable development. Among other things the policy requires that project development should take due consideration the land capability, ensures proper management of the land to prevent erosion, contamination and other forms of degradation. Environmental Impact Assessment for this project is intended to identify if there is potential for the adverse impact and to propose means for mitigating them.

3.2.7 The National Poverty Eradication Strategy (2000)

The strategy is viewed as an instrument for channelling national efforts towards broadly agreed objectives and specific inputs and outputs. The poverty reduction strategy is to large extent, an integral part of ongoing macro-economic and structural reforms. Achieving the target of accelerated growth will require significant efforts by different stakeholders to enhance productivity and increase investment in both human and physical capital.

3.3 LEGISLATIONS AND REGULATIONS

The following are relevant legislations and regulations which provide directives on how projects should be implemented in relation to concerned environmental and socio-economic settings. The project proponent will consult these legislations and regulations in the course of designing and implementing the proposed project activities.

3.3.1 Environment Management Act, No. 20 of 2004

The Environmental Management Act (2004) introduces a concept of right of Tanzanians to clean, safe and health environment and right of Tanzanians to access various segment of environment for recreational, educational, health, spiritual, cultural and economic purposes (Article 4 (1) and (2)). The Act imposes an obligation on developers to conduct an Environmental Impact Assessment prior to the commencement of the project to determine whether the project may/or is likely to have, or will have a significant impact on the environment. Article 81 makes EIA mandatory to all projects that fall under the EIA mandatory list (Schedule 3) into which this project falls. The Act also requires that project developers undertake regular environmental audits of their facility.

3.3.2 EIA and Audit regulations, 2005.

First schedule of this regulation, lists rehabilitation of an airport among types of projects requiring a mandatory Environmental Impact Assessment. Since such project is likely to have significant adverse environmental impacts, an in-depth study is required to determine the scale, extent and significance of the impacts and to identify appropriate mitigation measures. Furthermore, the regulation specifically provide for procedures and guidelines for carrying out Environmental Impact Assessment in Tanzania. This EIA review has been carried out in accordance with these regulations.

3.3.3 The National Land Act (1999) and its Amendment (2004)

The Land Act of 1999 provides for the basic law in relation to land other than the village land, the management of land, settlement of disputes and related matters. Act lays down key fundamental principles for occupying and using the land. Among them, is the principle that any land user shall ensure that land is used productively and that any such use complies with the principles of sustainable development. This principle applies to categories of land.

3.3.4 The Village Land Act (1999)

The Village Land Act of 1999 confers the management and administration of village lands to Village Councils, under the approval of the Village Assemblies, although the Minister of Lands is entitled to decide on the amount of land which can be owned by a single person or commercial entity. Any person who wrongfully obstructs or encroaches

on the public right of way and who does not within the time specified in any notice served on him remove that obstruction or cease that encroachment commits an offence and upon conviction is liable to a fine.

3.3.5 Land Acquisition Act (1967)

The Act gives the power to the President to acquire any land for any estate or term where such land is acquired for any public purpose. The Act goes on to define the circumstances in which public interest could be invoked, e.g. for exclusive government use, public use, for or in connection with sanitary improvement of any kind; for or in connection with laying out any new city, municipality, township or minor settlement or extension or improvement of any existing city.

Other purposes are in connection with development of any airfield, port or harbour; mining for minerals or oils; for use by the community or corporation within community; for use by any person or group of persons as the President may decide to grant them such land. The acquisition of the land for the right of way as well as for the resettlement sites is within the provision of this Act. Further the Act specifies other requirements prior to the acquisition of the land such as investigation for the land to be taken, issuing notice of intention to take land and mode in which notices will be served. It further defines the requirements for and restrictions on compensation.

3.3.6 The Mining Act No. 5 (1998)

This act provides for prospecting of minerals, mining and dealing in minerals. It also provides for building materials including all forms of rock, stones, gravel, sand, clay, volcanic ash or cinder or other minerals being used for the construction of buildings, roads, dams, and aerodromes or similar works. The Legislation makes Environmental Impact Assessment mandatory as a precondition for granting various categories of mining licences.

Rehabilitation of Shinyanga airport will require materials from borrows pits and quarries. Acquisition of these construction materials are all covered by this Environmental Impact Assessment study and respective licences will be acquired by the Contractors on behalf of Tanzania Airport Authority.

3.3.7 The Land Disputes Court Act. No.2 (2002)

Every dispute or complainant concerning land shall be instituted in the Court having jurisdiction to determine land dispute in the given area (Section 3). The Courts of jurisdiction include:-

(i) The Village Land Council
(ii) The ward Tribunal
(iii) District Land and Housing Tribunal
(iv) The High Court (Land Division)
(v) The Court of Appeal of Tanzania.

The Act gives the ward tribunals powers to resolve land disputes involving lands. If the ward tribunal fails to resolve the dispute, the mater can be referred to the District land and housing tribunal as established by the Land Act (1999). If any dispute will arise as a result of this project, the provision of this Act shall be observed.

3.3.8 Occupation Health and Safety Act No. 5 of 2003

This Act makes provisions for the safety; health and welfare of persons at work in factories and all other places of work. Also provides for the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with activities of persons at work. Relevant sections of the ordinance to the project activities include Part IV Section 43 (1) - Safe means of access and safe working place; Prevention of fire; and Part V on health and welfare provisions, which includes provision of supply of clean and safe to workers, sanitary convenience, washing facilities and first aid facility. Section 50, which is dealing with fire prevention issues.

Section 15 gives powers to the Registrar of factories and workplace to enter any factory or workplace to perform his duties as provided by the Act. Section 16 requires that factories and workplace should register with Registrar of factories and workplaces before commencing operations. Part VI is dealing with special safety provisions for working places involving handling hazardous chemicals, hazardous processes or hazardous equipment.

3.3.9 The Water Utilisation (Control and Regulation) Act No. 42 of 1974

The main Legislation to control the extraction of water for different use is that of Water Utilisation and Regulation Act No. 42 of 1974, which is a principle Act, repealing cap 410 of 1959. The Act has been amended by Act No 10 of 1981, written laws (miscellaneous amendment) Act No 17 of 1989 and the Water Utilisation (miscellaneous amendment) Act No 8 of 1997. Both the principle Act and its amendments are for the protection of the water resources and the user so that there is a balance between different uses.

Relevant provision of this act is that the water "*Shall not be polluted with any matter derived form such use to such extent as to be likely to cause injury either directly or indirectly to public health to livestock, or fish, to crops, orchards or garden, which are irrigated by such water or to any product in the processing of which such water is used*".

Section 11 of the Act provides right to owner of a plot to sink or enlarge any well or borehole thereon and abstract water there from, not exceeding 22,700 litres in any one day. However, this section provides distances to be observed before construction of borehole is made.

3.4 INSTITUTIONAL ASPECTS

The Environment management Act, No. 20 of 2004, sets out the institutional arrangement for management of environmental issues in Tanzania. The Environment Impact Assessment for the Sumbawanga airport will be undertaken following procedures laid down in the Environment Impact Assessment and Audit regulations, 2005.

Table 3.1: Institutional Aspect Frame Work

S/N	Level	Institution	Role and Responsibility
1	**Central Government**	Vice President's office (Division of Environment)	▪ Coordinate the implementation of the National Environmental Policy ▪ Approval of EIS and issuing of certificates ▪ Coordinate environmental management activities within the country
		National Environment Management Council(NEMC)	▪ Registration of project, screening and assigning the level of impact assessment ▪ Review of scoping report and approval of terms of reference, • Review of EIS and recommendation to the government. • Monitoring the proposed measures • Carry out environmental auditing
		Ministry of Infrastructure Development (Environmental Management Unit)	▪ Issuing policy guidance ▪ Providing legal frame works ▪ Carry out project environmental monitoring ▪ Carry out project environmental auditing
		Tanzania Airport Authority (Environmental Management Unit)	▪ EIA Study ▪ Oversee overall project Implementation ▪ Environmental project Monitoring ▪ Environmental project auditing

2	**Regional**	Shinyanga Regional Secretariat Office	▪ Oversee enforcement of laws and regulations ▪ Advice on implementation of development project activities ▪ Oversee and advice on implementation of relevant national policies
3	**Shinyanga Municipal Council**	District Commissioner's office	▪ Oversee enforcement of laws and regulations ▪ Advice on implementation of development project activities ▪ Oversee and advice on implementation of relevant national policies
		District Executive Director's Office	▪ In charge of all development within the Shinyanga municipal ▪ Coordinator of all departments within the municipal.
		District Environmental, Natural Resources, Community Development and Related offices	▪ Baseline data on social and economic ▪ Enforcement of laws and regulations
		District Environmental Committee	▪ Coordinate the environmental matters within the District

4. ENVIRONMETAL AND SOCIO-ECONOMIC BASELINE

4.1 INTRODUCTION

This chapter provides a description of relevant environmental, economic and social characteristics of the project core area (site specific), and areas in the immediate vicinity of the airport (Ibadakuli Ward) as well as broad description of the area of influence i.e. Shinyanga Municipality and Shinyanga Region. The level of details in the various sections depends on the interactions between the project activities and the particular environmental or socio-economic aspect. Information provided in this chapter will be superimposed on to the project concept and components for impact identification, evaluation and development of mitigation measures.

4.2 SITE DESCRIPTION (Project Core Area)

The topography of the airport environs and developments within the airport and outside its boundary, especially under the aircraft landing and take-off paths may have considerable influence on the effective utilization of an aerodrome.

4.2.1 Location and accessibility

The airport is situated within Shinyanga Municipality (between 3°20' and 3°45' South and 33°20' and 35°35' East), about 17.5 kilometres from Shinyanga town centre at Ibadakuli area. The project site can be reached by way of the Shinyanga - Mwanza road; Nzega/Kahama – Shinyanga road and the Dar es Salaam – Mwanza central railway line. A 2.5 km access gravel road to the airport branches from the Shinyanga – Mwanza road. Shinyanga airport is 152 km distance from Mwanza and about 1,200 km Dar es Salaam.

4.2.2 Biophysical features

1. Climate

Shinyanga airport experiences climatic conditions typical of the Shinyanga Municipality with a tropical type which is characterized by two seasons. The rain season having two peak seasons, the one starts in October ands ends in December, and the other in March and ends in April/May. Dry season has also two peak seasons, one starts in May to mid October and the other in January to February. Total average rainfall per annum ranges between 600 – 1000mm. Maximum average temperature ranges between 20^{o}C to 31^{o}C

and minimum temperature averages between 18°C to 24°C. Humidity is relatively high about 60 % in August – October; and about 22% in January – March.

Wind direction in the Municipality varies from time to time throughout the year. Normally, wind blows from southeast to the northwest direction despite that in certain occasion wind blows from northeast to southeast direction. The average wind speed in the municipality is 150 km/hr. Generally; Shinyanga municipality is subjected to severe windy weather especially during the dry spell period during which whirlwinds occurs frequently.

2. Topography

Shinyanga Municipality average altitude is about 3800ft. The absolute mark of the Shinyanga airport checkpoint (AMSL) is 3800 ft. The general Ibadakuli area is flat lowland of even topography with portions of rocky outcrops. Small hilly areas are in the far horizon. With the exception of very shallow storm water drains, there are no human-induced features on airport land that significantly interrupt the even terrain. There is a marked south to north gradient with the airport located on slightly higher grounds and drainage running into surrounding low lying areas.

3. Geology and Soils

Soils on the airport ground are predominantly of three categories: red well drained loamy soils, black poorly drained clayish soils (black cotton) that tend to be heavy in the wet season and crack in the dry season and gravel rich soils (e.g. at the borrow pit to the north west.

4. Hydrology

There is no permanent or temporary water course that crosses the airport grounds. The main hydrological feature close to the airport site is the Ibadakuli man-made dam used as a livestock drinking point. The low-lying area to the north contains the Chemu seasonal stream.

5. Air Quality and Noise Levels

No data are available with respect to ambient air quality in Shinyanga region. However, is generally believed to be good, since there are no major sources of pollution and that the area is not likely to be affected by long range transport of pollutants.

6. Biological Characteristics

Main vegetation cover on the site, (and immediate landing and takeoff paths) is characterized by grass and secondary vegetation that has been evened out by constant slashing. Prominent trees are baobabs (some about 50 m from the runway and regarded as obstruction). Others are acacia and several exotic trees. Vegetation tends to thin out during the dry season leaving bare patches. Domesticated animals – cattle, goats illegally graze on airport land. Airport staff reported: hyenas and fox pass across the airport grounds at night and early morning; burrowing animals including field rats and hares; reptiles include snakes (cobra), lizards and monitors; various insects including grasshoppers, butterflies, dung beetles and seasonal swarms of termites and ants from moulds founds on the airport grounds. The presences of trees, livestock and nearby Ibadakuli dam have attracted appreciable numbers of birds including those that are a menace to aircrafts. Records at the Airport Managers Office indicated between 2002 and 2004 four types of birds were noted: Grey heroin: 16 – 40 birds, all year January to December; Black stocks: 200 – 600 groups of birds, seasonal during the rains November to April; White stocks: 6 - 12 groups of birds, seasonal during the main rains season November to April; Cattle egrets: 100 – 400 groups of birds. Other avifauna includes white-chested crows, hawks, weavers and occasional swarms of queleaquelea.

Fig 4.1: Vegetation Type around Shinyanga Airport

4.2.3 Land Uses

The airport area is strictly designated for its particular purposes. Section 2.1 describes the sizes and conditions of the various facilities found on the airport field. TAA is responsible for planning for land use, management and enforcement of laws pertaining to land within the airport area. Site assessments and information from stakeholders reveal several activities which are carried out on the airport grounds albeit illegally. These include farming, grazing livestock, footpaths and stock tracks.

Fig 4.2: Livestock in the airport area

4.2.4 PLANNED FUTURE DEVELOPMENTS

Changes anticipated before and after the project commences includes:

- Construction of Shinyanga Bariadi road to tarmac level
- Construction of New sunflower oil plant at Shinyanga

4.3 SOCIO-ECONOMIC CHARACTERISTICS OF IMMEDIATE VICINITY OF AIRPORT

4.3.1 Land Ownership and Major Land Uses

Shinyanga airport according to current and future Municipal physical plans is located in the midst of residential/farmland area.

East

Between the airport grounds and the Shinyanga – Mwanza highway, on the approach area immediately at the end of the runaway there is an open grassed/farmland area with a few indigenous acacia trees. The tree lined gravel road to the airport dissects this area. Beyond the highway, is the Kapine settlement and Nyashinmba sub-village.

West

Immediately after end of runway, there is an open grassed space (-- acre). The portion towards the sisal fence is cultivated. These farms continue beyond the western boundary up to Chenge sub-village. The Busagara / Buzogore settlement is found much further (about 2 km) from the airport.

South

To the south, farms currently found on the airport grounds continue up to households of sub-villages of the Ibadakuli settlement (located over 2km away). High tension electricity cables are a prominent feature south of the airport.

North

Within and immediately after the north boundary, the airport is neighboured by farms and households (some as close as 50 m from the runway) of the Mwadogosa sub-village. Bulambila sub-village is found further north beyond the Chemu seasonal stream.

Thus, main land uses in the vicinity of the airport are farming and livestock keeping. Main crops grown include maize, brush-millet, sorghum, legumes (groundnuts, peas), sunflower and sweet potatoes. Livestock including big heads of cattle, sheep, goats and donkeys graze both inside and outside airport land space.

4.3.2 Administrative Aspects

Administratively, the Ibadakuli ward is within the Shinyanga Municipal Council which is made up of 3 divisions, 13 wards, 19 villages, 95 hamlets and 25 "mitaa". The area found in the immediate vicinity of the airport constitutes settlements, small farms.

4.3.3 Demographics

1. Population Number

Ibadakuli ward has a population of 9,755 of which 4,736 are male and 5,019 are female. Members eligible to special attention/vulnerable group in Ibadakuli ward (data not available) include orphans, disabled, widows, elderly and people living with HIV/AIDS.

2. Household's characteristics

There are 1,874 households in Ibadakuli ward with an average number of people per household is 5 of which 30 households are headed by women. Most of houses in the settlement are constructed by bricks with corrugated aluminium roofing; few are built of earth.

3. Occupation and job opportunity

The Ibadakuli residents economy mainly depends upon agriculture (millet, groundnuts and potatoes) and livestock keeping (Cattle, goat, poultry) activities, retail trade (businesses), formal employment and various social services provision. The agriculture, livestock keeping and small scale businesses employ approximate 80% of the total population.

4. Ethnicity

The indigenous people of Shinyanga Region are of Bantu origin. The dominant tribes are Wasukuma and Wanyamwezi.

4.3.4 Land Use and Tenure

1. Land use

The ward is easily reached from the business centre of Shinyanga Municipality. It has a mix of farming and settlement as the prominent land uses. Residential areas constitute both planned and unplanned areas with associated facilities such as health centres, schools etc.

2. Land ownership, Rights and Tenure

At the project area and area of influence, land ownership, rights and tenure are governed under the national land laws. Land in Tanzania is owned by the state and can be allocated by the state to users under specified tenure regimes. At the project area the Ward as an urban area, land is administered and managed by the Shinyanga Municipality (Lands Office). Most individuals and institutions especially in the planned and surveyed areas at Ibadakuli have been issued Right of Occupancy (Title Deed). Much of the unplanned areas land is held under customary right by individual households.

4.3.5 Social Services Infrastructure

1. Water Supply

Sources currently utilized by settlements at the project site for domestic use include pipe water systems from the municipal supplies, 33 wells and 1 water stream. Water from wells has saline nature. Only 56% of the population receives clean and safe water. The major water sources for the municipality are Ning'hwa Dam, Shallow wells near Mwadui, Hand pumps, Electric pumps and boreholes near Kizumbi. The Shinyanga airport is connected with water.

2. Health Condition and Facilities

Shinyanga Municipality has 24 dispensaries of which 7 owned by the government and 17 are private. Two hospitals are within the municipality, one is the Regional Government hospital and the other is owned by a religious organization (African Inland Church). At the project site there is a government dispensary (Government) and Kalandoto hospital (Missionary) which is located 3 km away. General health condition of the local

population is fairly good. Food security is fairly good. Diseases of public concern and cause of higher morbidity and mortality rates are HIV/AIDS, malaria, cholera, pneumonia, anaemia, diarrhoea, tuberculosis, and UTI. The environmental condition is fairly well maintained, most households use pit latrines. There are elaborate storm water drainage systems but poor solid waste disposal systems.

3. Education and Training

Education facilities in the Ibadakuli ward include 6 kindergarten schools, 6 primary schools, 3 secondary schools i.e. Rajan, Kolandoto and Uzogole; and 1 collage. In the primary schools total number of pupils is 2,798 (1411 male and 1387 female); and in secondary schools the total number of students is 931 (527 male and 404 female). Average number of pupils and students in primary and secondary schools is 70 and 40 respectively. Total number of teachers in primary schools is 43 while in secondary schools is 41.

4. Police, Security, and Fire Services

Regional police station is located in the Shinyanga Municipal about 17.5 km from the airport. There is also a security committee at Ward level and local militia (Mgambo). The airport has put fire fighting equipment in case of minor fire accidents and has emergence and rescue services.

4.4 SOCIO-ECONOMIC CHARACTERISTICS OF AREA OF INFLUENCE (Shinyanga Region, Shinyanga Municipality)

4.4.1 Demographic Profile

The distribution of the population in the project area of influence (Shinyanga Region, Shinyanga Municipal and other districts) from the 2002 Population and Housing Census is as shown in table 4.1. The estimated intercensal growth rate of the region is 3.3%. The data show a strong 1:1 male/female ratio and more people in the rural districts. Also table 4.1 below show population distribution by ward in the Shinyanga Urban District. About 90% of the population in the region earns their living from agriculture.

Table 4.1: Shinyanga Region/District Census Counts, 2002 and Intercensal Growth Rates

District/ Region	Total Population	Population (by Gender)		Household		Population Density 2002	Growth Rate (1988 – 2002)
		Male	Female	Number	Average Size		
Shinyanga Region	2,805,580	1,369,581	1,435,999	445,020	6.3	55	3.3
Bariadi	605,509	286,785	318,724	85,559	7.1		
Maswa	305,473	147,317	158,156	48,921	6.2		
Shinyanga Rural	277,518	135,421	142,097	45,517	6.1		
Kahama	596,456	295,578	300,878	100,853	5.9		
Bukombe	396,423	197,122	199,301	61,271	6.5		
Meatu	248,949	119,721	129,228	35,238	7.1		
Shinyanga Urban	135,166	66,835	68,331	28,217	4.8		
Kishapu	240,086	120,802	119,284	39,444	6.1		

Source: The 2002 Population and Housing Census, Government of Tanzania, 2004

Table 4.2: Population Distribution by Ward in Shinyanga Urban District In 2002

Ward	Population			Household	
	Male	Female	Total	Number	Average Size
Mwamalili	3,284	3,365	6,649	1,093	6.1
Kolandoto	5,381	5,754	11,135	1,911	5.8
Ngokolo	12,459	12,860	25,319	5,844	4.3
Ibadakuli	4,736	5,019	9,755	1,874	5.2
Shinyanga Mjini	3,577	3,461	7,038	1,541	4.6
Chamaguha	2,767	2,444	5,211	1,095	4.8
Ibinzamata	2,307	2,307	4,614	1,102	4.2
Kitangili	2,109	2,303	4,412	1,074	4.1
Kizumbi	4,614	4,623	9,237	1,719	5.4
Mwawaza	2,698	2,774	5,472	954	5.7
Ndala	5,893	6,006	11,899	2,651	4.5
Kambarage	9,278	9,550	18,828	4,395	4.3
Chibe	7,732	7,865	15,597	2,964	5.3
Total	**66,835**	**68,331**	**135,166**	**28,217**	**4.8**

4.4.2 Economic Activities

Economic activities in the project area of influence that could have a direct bearing to the upgraded airport are briefly described below:

4.4.2.1 Agriculture

Over 90% of the Shinyanga Region population live in the rural areas and practice agriculture. 41% of the Shinyanga municipality population depends on agriculture. Subsistence farming for food and cash crops is among major livelihood income generation. Cotton and tobacco are the main cash crops while food crops include sorghum, maize, paddy, cassava, sweet potatoes, pulses and groundnuts. In Shinyanga municipality the total land suitable for agriculture is estimated to be 300 km^2. The upgrading of the airport is expected to increase marketing channels and possibly stimulate investments in commercial large scale agriculture in Shinyanga Region.

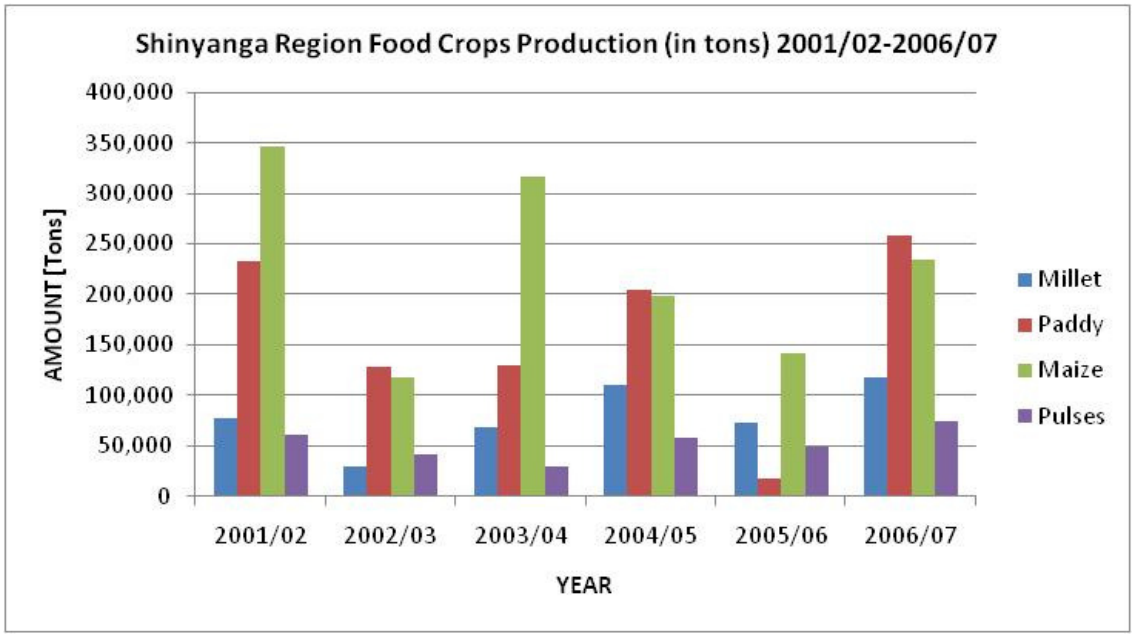

Figure 4.3: Estimated Average Production of Major Food (Tons) in Shinyanga Region between 1996/97 to 2005/06

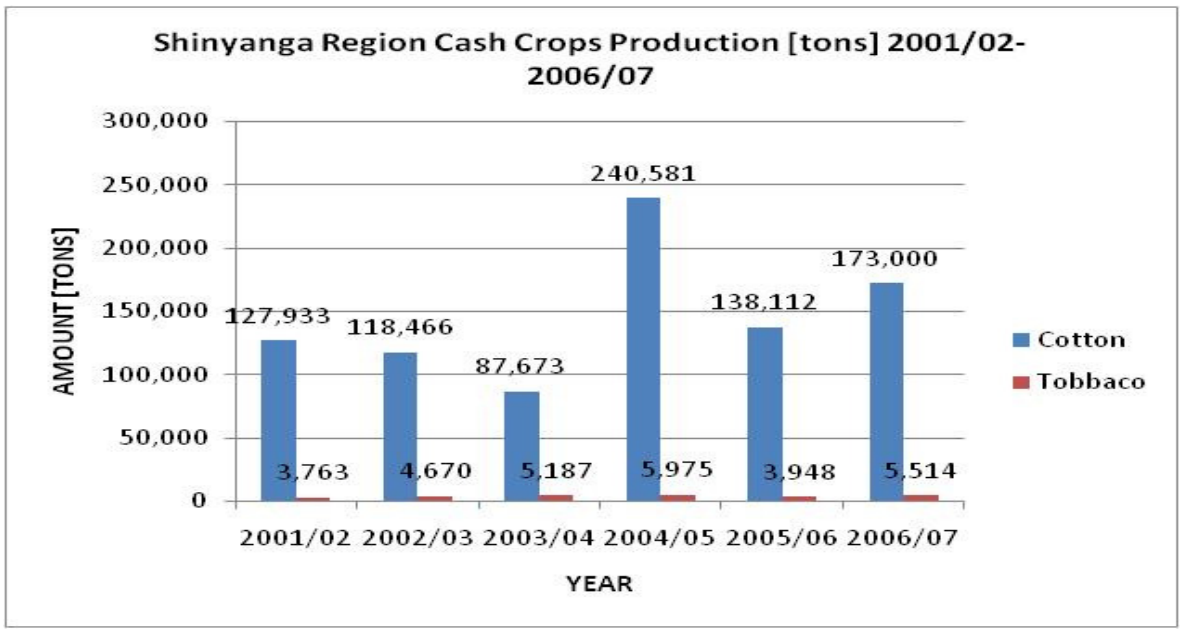

Figure 4.4: Estimated Average Production of Cash Crops (Tons) in Shinyanga Region between 1996/97 to 2005/06

4.4.2.2 Livestock Keeping

Shinyanga Region possess about 20-30% of the livestock population in the country. Livestock keeping includes traditional animal husbandry, dairy farming, poultry keeping and pig rearing. Animals reared in Shinyanga Municipality include cattle, goats, sheep, pigs, donkeys and chicken. Zero grazing is mainly used to feed animals in urban centres. Livestock keeping generates income to households and revenue to the Municipal council through various fees on livestock products, services and facilities. Along with live animals, other livestock products include milk ad eggs. The upgrading of the airport will facilitate the transportation of these products to a number of potentials markets.

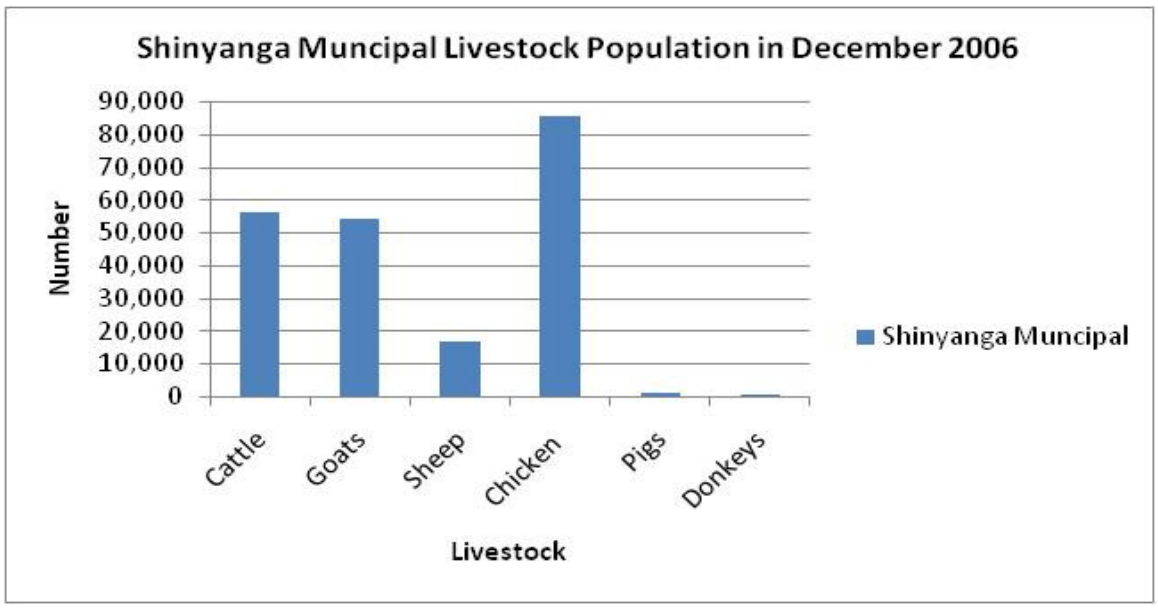

Figure 4.5: Estimated Livestock Population in Shinyanga Municipality as of December 2006.

4.4.4.3 Mining

Shinyanga region is endowed with substantial deposits of mineral and play a significant role in mineral production n the country. The deposits consist mainly of gold and diamonds found in different areas within the region and it has attracted a large flow of foreign investment. Gold is mined in Bulyankulu and Nyakafuru in Kahama and Bukombe districts. Diamond deposits are concentrated around Mwadui area. There are also artisanal miners who mine gold mainly in itilima, Samuye and Mwakitolyo. The Shinyanga municipality is not endowed with mineral resource compared with other districts in the region. Mining and quarrying activities in the Municipality are mainly for sand, stones and aggregates, which are used for building purposes.

4.4.4.5 Other Activities

1. Industry

The contribution of industries to the Shinyanga region economy is growing due to the increase in investment in mining and manufacturing sectors. Large scale industries include Williamson Diamond Ltd, Kahama Mining Ltd., CASPIAN Construction Ltd. and El

Hilal Minerals Ltd. Small scale industries available in Shinyanga Municipality include 8 ginneries (one owned by SHIRECU and 7 by the private sector); 7 oil mills, 56 small scale industries like carpentry, welding, garages and electrical and civil works. The expansion of the airport may attract more investors in Shinyanga Region and enhance industrial sector.

2. Forestry

In Shinyanga Municipality there is a National Forest Reserve, which covers an area of 181.7 hectares. The forest is situated at Lubaga 'A' and is maintained by the central government under the Ministry of Natural Resources and Tourism. The Municipality has nine (9) natural forests reserves namely Ning'hwa Dam 0.5 km width, Mwamalili 20 acres, Mwamagunguli, Ibadakuli Dam 100 m width, Mwagala 20 acres, Mwashele 60 acres, Kizumbi 600 m and Mwawaza West. Forestry are the sources of domestic energy and industrial raw materials. Forests also provide useful non-wood products mainly honey and beeswax.

3. Beekeeping

Beekeeping in Shinyanga Region is taken as one of the economic activity. Modern Beekeeping is mainly undertaken in Kahama and Maswa districts. Tradition beekeeping is mainly undertaken in Bukombe and Kahama. From 1997 to 2005 there were 571 modern beehives and 2,057,704 traditional beehives. The expansion of the airport can facilitate the realization of the potential and easy marketing of the honey and beeswax to potential markets inside and outside the country.

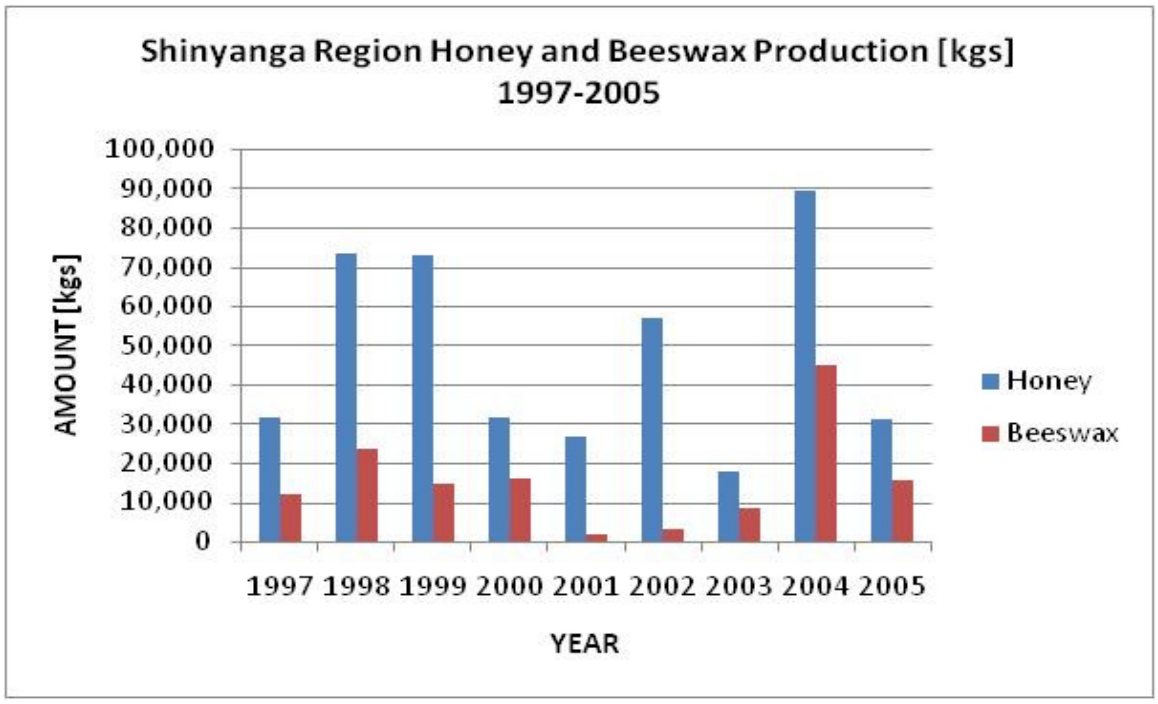

Figure 4.6: Honey and Beeswax Production in Shinyanga Region (1997-2005)

4. Wildlife

Shinyanga Region has a wide variety of wildlife which includes hippo, lion, zebra, buffalo, wild dog, bushbuck, impala, giraffe and baboon. The region has two game reserves i.e. Maswa and Kigosi and one game controlled area i.e. Makao Wildlife management area. The fairly large wildlife areas in the region with a diversity of wildlife species already attract a fair number of tourists. However, these wildlife attractions are yet to be developed in terms of tourist accommodation, camping site for tourists hunting. The expansion of the airport may facilitate the realization of the tourists potentials existing in Shinyanga Region and contribute to the region economy growth.

4.5 ECONOMIC INFRASTRUCTURE

4.5.1 Roads

Shinyanga Region has a total of 4,953 km of trunk, regional, district and feeder roads network. The major roads include the Shinyanga-Mwanhunzi-Arusha, Mwanza-Shinyanga-Dodoma which also provide alternative route connection with Dar es Salaam. Shinyanga Municipality is connected with these roads. The Municipality is also connected with other parts of the Shinyanga Region by feeder roads. The municipal has roads within the town covers a total length of 30 km out of which 2 km is tarmac surfaced and 28 km is of gravel surfaces. Most of these roads are impassable during the rain season. The expansion of the airport will enhance the transportation to and from the Municipality and the region.

4.5.2 Air Transport

Air transport facilities available in the region include one airport for Shinyanga which is located within the Municipality at Ibadakuli ward, 6 air strips in Bariadi district, 5 air strips in Meatu, 2 air strips in Kahama and 1 air strip in Bukombe and Maswa respectively. Eight of the air strips are owned by TANAPA, 2 by TAA, 1 by Kahama Mining Company Limited (KMCL). The region enjoys flight services to and from Dar es Salaam, Tabora, Arusha, Moshi, Zanzibar and Mwanza. The air service operators include Precision air, and Charter Plane operating companies (mainly for Mining Industry). It is envisaged that the expansion of the airport will benefit the region and provide regular flights between the region and other parts of the country.

4.5.3 Railway

Railway line from Mwanza to Dar es Salaam passes through Shinyanga, and is an important mode of transport within the region. This line provides travel linkage between the region and the coastal, central, western Zones and other Lake Zone Regions in the mainland Tanzania as well as with the areas outside the country via Kigoma. The line is the major means for both export out and imports in the Shinyanga. However, the line is unreliable these days which makes the improvement of the Shinyanga airport important for easy transport to and from the region.

4.5.4 Communication Networks

The existing communications networks in the municipality and other Shinyanga districts include the TTCL. Postal services are provided by Tanzania Posts Corporation at the main post office. Major mobile phone operators i.e. Tigo, Vodacom, Celtel and Zantel are operating in Shinyanga.

4.5.5 Energy

Sources of energy utilized in Shinyanga Region for both industrial and domestic use emanate from various sources such as hydro and thermal electricity, firewood, diesel, petrol and kerosene. TANESCO is the mainly supplier of electricity in the region. The project area which is in the vicinity of Shinyanga municipality is supplied with electricity from the national grid connected to these sources. Much of the population of Shinyanga Municipality and other districts depends excessively on firewood and charcoal as their source of energy for cooking.

4.5.6 PLANNED FUTURE DEVELOPMENTS

Changes anticipated before and after the project commence:

- Construction of Shinyanga- Bariadi road to tarmac level
- Construction of Sunflower oil industry at Shinyanga municipal

4.6 HIV/AIDS STATUS IN THE AREA OF INFLUENCE

Shinyanga Municipality has been engaged in the fighting against HIV and AIDS since 198 when the first HIV/AIDS cases were reported in the Region hospitals. Since then HIV/AIDS epidemic spread rapidly and it affects the lives and well being of growing number of Municipality population. Prevalence rate of HIV/AIDS in Shinyanga Municipality is estimated to be 7% which has been reduced from 11% due o various efforts by stakeholders. The efforts include addressing the issue of behavioural changes, strengthening awareness on HIV/AIDS matters to the communities, improving social-economic lives of majority who are poor and specifically most vulnerable groups including infected and affected ones.

The Municipality has established five health facilities which provide voluntary counseling and testing (VCT) services to substantiate the efforts of combating HIV/AIDS. The

Municipality has trained 29 home based care providers whose render services for 13 wards of the municipality. Other services available in the Regional Hospital include provision of ART/ARV and CD4 screening.

Other interventions include sensitization on supply and use of condoms in Guest Houses, offices, and among the community through various campaigners. In 2006, a total of 5,000 condoms were distributed. Also the Municipality through its education department has conducted a number of training on HIV/AIDS to 65 teachers. 52 schools have benefited from these trainings. Also 232 students have been trained on how to safeguard themselves from HIV/AIDS.

Shinyanga Municipality has been receiving funds from various donors for the sake of implementing HIVAIDS interventions. These include Tanzania Commission for AIDS (TACAIDS), TANESA, OXFAM GB, CARE VSHP, GLOBAL FUND, SHY/MARA-RFAs, EGPAF and UNDP. Figures below shows the AIDS cases reported in Shinyanga Municipality.

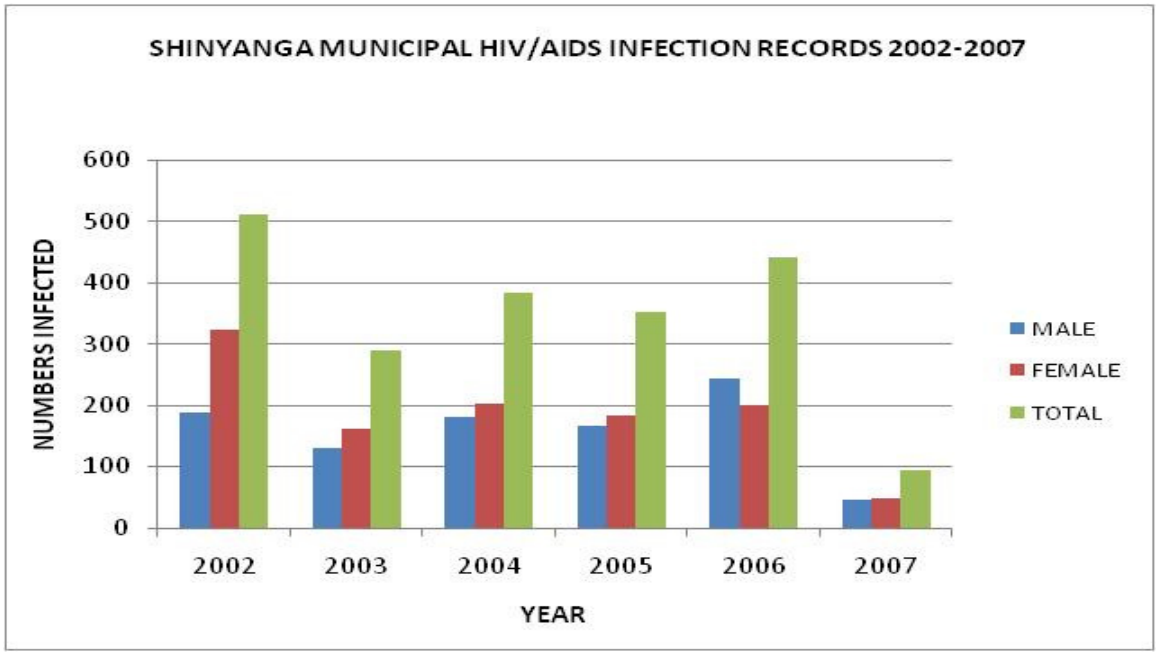

Figure 4.7: Shinyanga Municipality HIV/AIDS Infection Records from 2002-2007

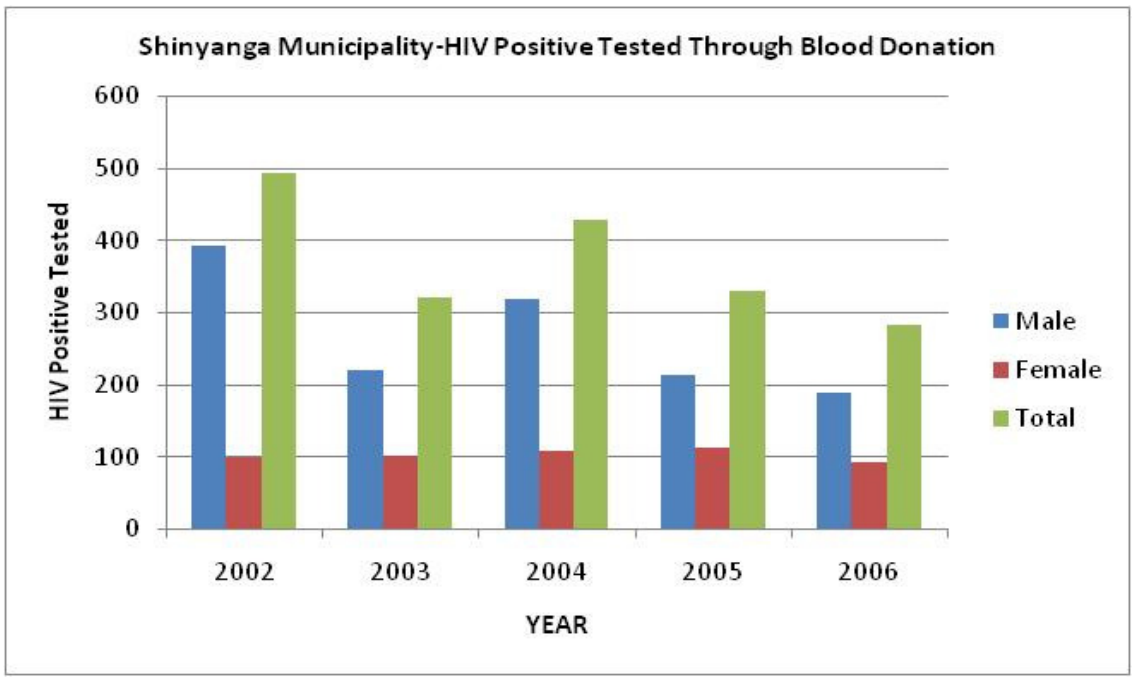

Figure 4.8: Shinyanga Municipality- Records on HIV Positive tested through Blood Donation

5. PUBLIC PARTICIPATION

One of the objectives of the scoping study for the proposed rehabilitation and expansion of Shinyanga airport was to identify and involve key stakeholders in the Environmental Impact Assessment process. The process afforded opportunity to the stakeholders to express their views and concerns to be included in the Environmental Impact Assessment study.

The Consultants and Tanzania Airport Authority identified organizations, groups and individuals considered to be key stakeholders that might be impacted by the project components or have influence on the project. These stakeholders include government sectors, e.g. Ministries/Departments/Agencies; District, Ward and village governments; environment committees and experts.

The Consultants held consultations with different stakeholder listed in Annex IV; the Environmental Impact Assessment team explained the scope of the project and solicited views from the stakeholders. In all cases Stakeholders' views were sought on their acceptance of the project.

The consultant advertised in all project areas by placing posters at strategic public points inviting to express their views concerning the proposed project.

5.1 THE STAKEHOLDERS

The assessment team held interviews and meetings with officials from government ministries, departments and agencies, district authorities, public and private organizations and NGOs. The following emerged as the key stakeholders for the Shinyanga Airport Rehabilitation Project:

- Central Government: Ministries, Departments and Agencies. These include Vice President's Office (Division of Environment, NEMC), Ministry of Lands, Housing and Human Settlements Development and, Ministry of Energy and Minerals.
- Project Proponent – Tanzania Airport Authority: Shinyanga airport manager, Fire rescue team commander and design and planning manager.

- Shinyanga Regional Secretariat and Shinyanga District Commissioner's Office.
- Local Government Authorities: Shinyanga Municipal Council: Municipal Director, and Municipal Management Team (Planning, Land, Community Development, Engineers, and Agriculture Departments).
- Municipal Council Chairperson (Mayor), Councillor
- Municipal Committees: Environmental, HIV/AIDS

5.2 ISSUES RAISED BY STAKEHOLDERS

5.2.1 Negative Impacts & Challenges

Stakeholders in Shinyanga Municipality pointed out the following issues that have been clustered into technical, social and environmental for clarity.

1. Official airport boundaries

The airport (like other government owned properties) does not have a Title Deed issued by the Ministry of Lands and Human Settlement Development / Shinyanga Municipal Council. There are claims of various previous expansions of the airport since 1982 from just being a small airstrip. The then District Commissioner, Member of Parliament and Airport Manager (now diseased) are said to have acquired land from locals and paid compensations. However, there are no official records of the same and according to the local leaders and Airport staff about 138 individuals claim ownership of land within the airport grounds. There are beacons marking airport boundaries but no official legal documents held by Tanzania Airport Authority to ascertain the boundaries.

2. Prohibited activities on airport grounds

The airport has no outer fence. Its boundaries are currently defined by a live fence of sisal plants and beacons (planted in 2002). However, the restrictions imposed on activities within airport airspace are yet to be observed by local people as there a number of households (seven) and various farms within the airport land space. A bigger number have farms just outside airport grounds. However, for the expansion of the airport, no land take issue as there will be no any effect on existing homesteads properties and services.

3. Disposal of wastes

Shinyanga lacks a proper sanitary landfill or waste water stabilization ponds. Waste is haphazardly disposed of in open damps and forested areas.

6. ENVIRONMENTAL IMPACTS ASSESSMENT

6.1 IMPACTS IDENTIFICATION AND SIGNIFICANCE

This section determines likely sources and quantification of both negative and positive environmental impacts.

6.1.1 SITE SELECTION PHASE

Site selection phase presents the overarching impacts of the presence of the project on the general natural settings at the project area. The impacts are further analysed in subsequent phases and sections. In upgrading the Shinyanga airport issues of land take will not apply as there is enough land within the airport boundaries to accommodate the expansion activities. Furthermore within the land required for extensions there are no natural features of ecological value that will be disturbed/cleared, thus main impacts sources may relate to natural factors and processes.

6.1.1.1 Effects of Natural Factors and Processes

- **Potential Impact: Damage to Airport Buildings/Erected Structures and Disruption of Operations**

These relate to possibilities of natural factors e.g. climatic elements and earth movements etc. to have effects on the project components. Shinyanga constitutes flat undulating plains. The area is known to sometimes experience extreme climatic conditions in the months of March - May influenced greatly by its proximity to Lake Victoria) with heavy rains, that frequently cause widespread flooding and consequent damage to buildings, farms and other built infrastructures. There are no recorded earthquakes in Shinyanga region. Impact associated considered as: **negative, long-term and moderate significant**

6.1.2 DESIGN PHASE

Main impact sources for the design phase relate to:

- Choice of Best Available Techniques (BAT), technologies, and practices (to meet both Tanzania and international Health, Safety and Environmental (HSE) standards);
- Setting management procedures for handling and disposal of wastes, health & safety procedure;
- Planning for availability of adequate resources

6.1.2.1 Storm Water Drainage and Overflows

- **Potential Impact: Ineffective Utilization of the Airport / Damage to Rehabilitated Structures.**

Due to the airport flat terrain, storm water tends to remain stagnant on the airport grounds especially during the heavy rains. The Ibadakuli area is a wide flat plain with no prominent high rises to allow for natural drainage. Improper drainage may affect effective utilization of the airport and also cause damage to rehabilitated structures.

There exists a good slope towards the lowland and gravel borrow pit can be utilized to design and build efficient drainage channels. This should be done with due consideration and mitigation of potential loads stressed under section 6.1.2.3 below. Impact associated considered as: **negative but high significance**.

6.1.2.2 Exploitation of Borrow Pits/Quarries and Other Natural Resources

- **Potential Impact: Degradation at Points of Source of Construction Materials**

The project requirements of construction materials are indicated in table 6.1.

Table 6.1: Materials Requirement for Construction Works.

Type of materials	Quantity	Potential Source
Gravel	15,000 m^3	Airport Borrow pit
Aggregates	13,000 m^3	Usanda Quarry
Sand	2,700 m^3	Ibadakuli area
Water	2,000,000 litres	Ibadakuli Dam

Extractions of construction materials from both authorized borrow pits and quarries on government land, communal land and on private-owned land are associated with rampant degradation at points of source with no efforts of restoration/re-vegetation. Most exploited borrow pits are found on private owned /communal land of natural vegetation or planted with crops which have been cleared/disturbed.

The aggregate borrow pit at Usanda (35km away) and gravel borrow pits at Ibadakuli/airport have signs of rampant and haphazard exploitation methods gravel is already depleted. Shinyanga Municipal Council has no future plans for restoration of any of these sites. The airport gravel borrow pit is close (100m) to a stream and a wide lowland. Pollution risks include sediment overload into the stream during rains and contamination by oils from excavators/loaders.

Fig 6.1: Airport Borrow pit

The aggregate borrow pit at Usanda (25km) operated by the KASCO mining company (quarry and plant) has the highest potential; EIA conducted and Environmental audit was underway.

Fig 6.2: Stone Ready for Crushing at Usanda Quarry

There is great likelihood of over-exploitation of local water resources as Shinyanga is very poor in water supplies depending sorely on boreholes, shallow wells and ponds. Ning'hwa dam can barely sustain current demands and Mwawaza boreholes are said to be overexploited. The nearby Ibadakuli dam has enough fresh water (for construction and livestock not domestic use) only during the rains but tends to dry-up and become salty in the dry season.

Resources extraction is open to all Contractors / users, thus, the project will be adding on to existing problems (cumulative impacts). Impacts associated with resource extraction from off-site locations are considered as: **secondary negative, cumulative, short to medium -term but of high significance**.

6.1.2.3 Haphazard disposal of wastes

- **Potential Impact**: **Contamination and /Impaired Quality of Receiving body – Land and Water.**

Main sources of construction waste are cleared vegetation and top soil (overburden), rubble from demolished runway and facilities, and domestic waste from construction crew. During operation of the upgraded airport, various type of wastes will be generated including solid and liquid wastes from food and refreshment centres, offices and business centres; fuel and oils from maintenance workshops/hangar and aircraft fuelling points. Designs should take due consideration for prevention of haphazard waste disposal. The wastes may contaminate land or be washed into local surface and ground water resources and impair the quality of these receiving bodies. Other impacts include increased bird population (attracted by food waste).

However, the area which will be cleared for the rehabilitation and expansion of airport is not significant, only 20,000 m^2 which is expected to be cleared of which will produce 800 m^3 of cleared vegetation that will need to be disposed of at the Ibadakuli damp site.

The project is expected to employ 25 skilled and semi-skilled personnel and about 160 labourers who will be hired locally. There shall be temporary construction camp site adjacent to the airport which will accommodate junior and semi skilled staffs. Accommodation of senior staff will be in Shinyanga town and for labours will be from

their homes, since will be residence of Shinyanga municipal. An average 0.5Kg waste will be produced per person per day. It expected that about 67.5tons of domestic solid waste will be produced for the 2 years duration of the project construction. Impact associated considered as: **negative, cumulative, short-term but of high significance.**

6.1.2.4 Atmospheric Emissions Generating Equipments

- **Potential Impact**: **Deteriorated / Impairment of Local Air Quality**

Air pollution by gaseous emissions from various sources is an issue for consideration during design stage particularly in the choice of technologies and practices to be used under the project. Sources of air pollution during construction and operation phases of the airport will be gaseous emissions such as CO_2, NOx, SOx, particulate matters and hydrocarbons from fuel powered equipments and vehicles. Main impact is impairment of local air quality, the extent of which will depend on quantities emitted, duration and prevailing atmospheric conditions. Table 6.2 shows the various construction emissions generating equipments.

Table 6.2 Emissions Generating Construction Equipments.

S/N	Type	Function	Number
1	Excavator	Excavation of land	3
2	Wheel loader	Loading truck	2
3	Trucks	Haul	30
4	Motor grader	Clearing and Grading	4
5	Compactor	Compaction	5
6	Asphalt plant	Asphalt producer	1
7	Crasher	Aggregate crusher	1

Due to the number of the equipments involved, the emissions may affect local air quality but will have no significant impact on global air quality issues**.** Therefore impacts associated are considered as: **negative, short-term, low significance.**

6.1.2.5 Base Camp

Site(s) will be required, though temporarily at both the airport site and at borrow pits for storage of equipments and materials and for an office for construction crew. At the airport area will be temporary building with all facilities like water, electricity and sanitation system, while at the borrow pit there will be camp for supporting staffs like security guard and drivers.

. Impact sources for consideration during design phase:

- Land requirements: impacts similar to section 6.1.1.1 above
- Waste disposal: impacts similar to section 6.1.2.3 above

6.1.3 MOBILIZATION PHASE / CONSTRUCTION PHASE

Main impact sources under this phase include:

- Clearance of extension portions and if necessary access routes and sites for support facilities (storage, crew).
- Transportation of construction equipments, materials and labour.
- Setting up and operation of base camp
- Construction works

6.1.3.1 Vegetation Clearance

- **Potential Impact: Damage Local Vegetation Cover and Potentially Loss of Local Biodiversity.**

Clearance of vegetation – especially bulldozing to ground level - has tendency to damage local vegetation cover and potentially damage/ loss of habitats and local biodiversity and increase risks to erosion. Permanent clearance will be confined only to the extension portions at which vegetation is mainly heavily mowed grass and other secondary vegetation. These are important in the stabilization of soil but will be replaced by grass capable of the same functions. Thus, on the overall vegetation clearance will constitutes no significant ecological loss. Impacts associated are considered as**: Low significant**.

6.1.3.2 Air pollution From Transportation and Construction Work

- **Potential impact: Impairment of Local Air Quality**

Equipments capable of generating air emissions are elaborated above (section 6.1.2.4.) where technologies and practices for reduction / elimination of emissions are considered. However, even with the best available technologies, most of the equipments and vehicles emit gases such as CO_2, NOx, SOx, particulate matters and hydrocarbons - regarded as residual air pollution. Congruent to these are pollutions from fugitive dusts emitted during clearing / excavation works and from vehicles running on loose-surface roadways.

Construction equipments, aggregates, cement etc. will be transported by using various means including cargo train wagons and trucks from as far as Mwanza/Dar es Salaam about 164 km and1200 km away respectively. Gravel will be obtained from airport borrow pit and other materials e.g. sand will be procured locally in Shinyanga and transported by trucks to the airport site. Table 6.3 is the number of truck journeys required to mobilize construction materials from off-site locations to the airport construction site.

Table 6.3 Number of Truck Journeys to Mobilize Construction Materials

Type of material	Quantity (m3/Tonnes)	Distance from Source (km)	Truck Journeys (Number)
Granular Material	15,000	0.1	1,875
Aggregates	12,250	35	1,530
Sand	2,700	17	338
Bitumen	1,900	1,700	95
Water	2,000,000	0.01	400

The distances to be covered, frequency of movement and corresponding emissions are quite considerable and could have deteriorating effects on local air quality. But, these impacts are short term and could have no impacts on global air quality. Congruent to transportation emissions from are pollutions from fugitive dusts emitted during clearing / excavation works and from vehicles running on loose-surface roadways

6.1.3.3 Fuel, Oils, Lubricants Spillages/Leakages

- **Potential Impact**: **Contamination / Impairment of Quality of Receiving Bodies**

Incidental spillage of fuels and oils may occur during refuelling and minor equipment repairs or leak from equipments that are not well maintained. These may contaminate land or be washed into local surface and ground water resources and impair the quality of these receiving bodies as elaborated under section 6.1.2.3.

6.1.3.4 Excavation

- **Potential Impact**: **Damage/Disturbance to Sub-Surface Organisms.**

Trenching (for drainage channel, new fence etc.) and construction of sub-base especially on the extension portion of the runway may cause damage/disturbance to any sub-surface organisms found in the project area. Shinyanga airport vegetated areas, contain ants and burrowing rodents that may be affected as well as the usual subsoil microorganisms, arthropods and earthworms etc. However, these are not unique or rare organisms and found in the general project area. Impact associated considered as: **negative**, **localized, short term and moderate significance.**

6.1.3.5 Inadequacies in Compaction and Resurfacing

- **Potential Impact**: **Damage /Erosion of Exposed Surfaces**

Inadequate compaction and resurfacing compounded by rain, trampling etc. may cause damage to rehabilitated structures and soil erosion and consequent sediment load in runoffs (section 6.1.2.3 above). This is mostly likely to happen if construction is undertaken during the months of March - May when Shinyanga experience heavy rains. Impact associated considered as: **negative, localized, short term and moderate significance.**

6.1.4 OPERATION PHASE

Once the airport is upgraded, there is anticipated increase in traffic - passengers, aircrafts, cargo, etc. Main anticipated impacts that may occur during operation of upgraded airport are considered during design phase so that mitigations and appropriate procedures are put in place before the airport is operational. Thus impact sources for this phase relate to inadequacies in maintenance and monitoring, unforeseen or accidental events and residual impacts.

6.1.4.1 Air emissions from increased aircrafts

- **Potential Impact**: **Impaired Air Quality**

A consequence of expanded capacity of the airport will be increased air emissions from increased numbers of aircrafts including gases such as CO2, NOx, SOx, particulate matters and hydrocarbons. However initially frequency of aircraft anticipated will be low, thus the emissions will have no significant impacts on local or global air qualities. Impacts associated are considered as: **Negative, long term and Low significance**

6.1.4.2 Inadequacies in Operation and Maintenance

Even with a well designed and rehabilitated airport that has take environmental impacts consideration , inadequacies in operations, maintenance and monitoring could result in adverse post- construction impacts including but not limited to:

- **Contamination and /Impaired Quality of Receiving Body – Air, Land and Water from wastes**
- **Damage to Facilities / Disrupted Airport Operations**
- **Depletion of Natural Resources**

These impacts could be a result of one or a combination of several factors all related to how eventually the upgraded airport will be operated and the various environmental concerns managed. Main aspects of concern include:

(i) Storm Water Runoff Management

Lack of routine and periodic maintenance of the runway, storm water drainage, buildings and other airport facilities may in future result in storm water overflows and damage to rehabilitated/new structures as expounded under design section 6.1.2

above. Flooded airport is the main cause of frequent closure of airports, disrupted airport operations and boycott by some of the operators.

(Ii) Management of Point – Source Pollutions (Air Emissions and Liquid Waste Management)

Lack of procedure for replacement and repair of worn out / outdated equipments (e.g. air emissions - generating equipments, vehicles etc), leakages and discharges from sewerage, waste water and fresh water supply systems into the surroundings.

(Iii) Management of Waste (Non-Hazardous and Hazardous Materials)

Lack of enforcement of procedures put in place for collection and disposal of non-hazardous solid wastes; transportation, use, storage and disposal of hazardous materials; management of fuels and hydrocarbons (oils, petroleum, lubricants) including accidental spillage of harmful substances and waste cleaned from storage area etc. Waste disposal hazards are expounded under design section 6.1.2 above.

(iv) Availability of Resources – Financial, Human and Natural Resources

Lack of resources required maintaining the airport facilities e.g. sustained water supply and power supply, trained and motivated staff etc. are the main cause of negative impacts experienced during airport operations. Impacts considered as: **Negative, long term and high significance**.

6.1.5 DECOMMISSIONING

6.1.5.1 Disposal of Waste from Demolished Structures

- **Potential Impact: Contamination/Impaired Quality of Receiving Body**

In the event of future rehabilitations and upgrading, the runway and associated facilities may need to be demolished necessitating disposal of demolished waste. Haphazard disposal may cause contamination/impaired quality of receiving body – especially land, and water resources.

6.2 IMPACTS MITIGATION

Section 6.1 above has identified potential environmental impacts and their significance. This section provides a summary of mitigation measures of those impacts which are considered to be of moderate to high significance.

6.2.1 SITE SELECTION PHASE

(I) Damage to Airport Building/Erected Structures and Disruption of Operations Due to Nature Factors and Process

To mitigate this impact, the buildings and other structures within the airport area will be designed to the appropriate structural and civil engineering codes and practices. Building foundations, columns and frames shall be reinforced with high tensile strength steel bars to achieve the structural ability to withstand climatic elements anticipated in this locality.

6.2.2 DESIGN PHASE

(I) Damage to Rehabilitated Structures Due to Ineffective Storm Water drainage and Overflows

Normally during the design of airport storm water impact is given a high priority, with the limitation of gradient (slope) required for the runway, taxiway and apron. Storm water effect have been mitigate successfully in almost all airport design. Therefore to mitigate this impact a proper hydrology analysis will be carried out, considering the airport topographical features, amount of rainfall and catchments area as the major factors of design of storm water channel. Also storm water drainage design will take into consideration the existing channel along the airport area, if amount of storm water produced is higher than the existing channel can accommodate further additional and supplementary drainage provisions will be designed and installed as part of the rehabilitation and upgrading works.

(II) Exploitation of Borrow Pits/Quarries and Other Natural Resources

Effects of exploitation of borrow pits/quarries and other natural resources will be mitigated as follows:

- Exploitation of construction materials will be from the authorized source only as indicated in table 6.1
- Restoration of the borrow pits/quarries after use constituting leveling the area and seeding or planting of trees and/or grasses will done in association with local government (natural resources department) and local environmental NGOs. If appropiate the leveled area will be left for natural re-vegetation.
- Maintain construction equipments in good running condition and refuel restriction at the workshop/base camp.
- NB: The demand for water of about 2 million litres for two years does not constitute application for water rights from Lake Victoria Water Basin as directed by The Water Utilisation Act No. 4 of 1974.

(III) Contamination and Impaired Quality of Receiving Body- Land and Water

To mitigate the impacts of wastes an efficient collection and disposal system based on the principles of reduction, re-use and recycling of materials, shall be instituted at the airport.

- To reduce the cost of the project, much of the excavated soil and rubble materials will be reused as initial filling materials where leveling of runway, taxiway and apron is required.
- Cleared vegetation, top soil and rubble from demolished buildings at the airport area will be used to cover haphazardly disposed municipal waste at Mawaza damp site. Alternatively in consultation with municipal council, the waste will be used to fill up any other infrastructures (roads, pits etc) that needs filling.
- Introduction of waste disposal bins, warning notices, "DOs & DoNTs" etc posted at strategic points, through the airport area.
- No, on site burial or open burning of solid waste shall be permitted at the airport. Tanzania Airport Authority will make use of the existing municipal council solid waste disposal and collection system.
- Wastes not suitable for incinerations and general municipal waste damping (e.g. Batteries, plastics, rubbers, tyres, etc) shall be removed from the airport for recycling, treatment, and/or disposal by licensed contractor as appropiate.

- Instructions to contractor to put on his/her methodologies for handling hazardous waste such as oils, lubricants and non combustible waste during bidding process.
- Waste management training for all personnel, operators and services providers at the airport.
- Liquid waste will be collected using a cesspit tanks system at the airport area. When full Tanzania Airport Authority will make use of the existing municipal council/urban water supply and sewerage authority cesspit empting services.

(IV) Deteriorated / Impairment of Local Air Quality due to Emission Generated from Construction Equipments

To mitigate this impact measure of control of exhaust emissions shall take place during project implementation which includes:

- Maintain equipment in good running condition, no equipment to be used that generates excessive black smoke.
- Enforce vehicle road restrictions to avoid excess emissions from engine overloading, where practical switch off engines when not in use.
- Routine Inspection of equipments

6.2.3 MOBILIZATION /CONSTRUCTION PHASE

(I) Destruction of vegetation Cover / Loss Local Biodiversity from Vegetation Clearance

To mitigate the impact the contractor and Tanzania Airport Authority during construction shall ensure that:

- Indigenous vegetation in areas that will not be impacted by the project shall not be disturbed.
- Rehabilitation by seeding or planting grasses to all areas that will not be occupied by runway, taxiway, apron, buildings and other airport facilities on the project site.
- Avoid planting non-native and exotic species on the site as well as those that constitute obstacles according to the airport regulations.

(II) Deteriorated / Impairment of Local Air Quality due to Emission Generated from Construction Equipments

Mitigation measures similar as in section 6.2.2 (IV)

(III) Contamination/Impairment of Quality of Receiving Bodies from Fuel, Oils, Lubricates Spillages/Leakages

To mitigate the impacts the contractor and Tanzania Airport Authority during construction shall ensured the following:

- Routine maintenance and checks of contractor's equipments and trucks.
- Training of site personnel in proper handling, storage and cleanup of contaminating material into the environment.
- Storage and routine handling of fuels, lubricants, oils and other potentially contaminating materials to occur in weather protected areas equipped with secondary containment systems for spills as appropiate.

(IV) Damage/Disturbance to Sub-surface Organisms Due to Excavation

To mitigate the impact the contractor and Tanzania Airport authority during construction shall ensure that only those areas needed to be excavated are ones excavated and backfilled after construction.

(V) Damage/Erosion of Exposed Surfaces

To mitigate the impact the contractor and Tanzania Airport Authority during construction shall ensure the following:

- That construction will be as per engineering design and procedure of which a minimum requirement of compaction strength is achieved during the construction. That is maximum dry density (MDD) specified in the design manual by consultant.
- Divert runway water away from structures
- Maintain gravel fill and/or re-vegetate around the structures

(VI) Impairment of Air quality Due to Dust

In order to mitigate dust impacts it is recommended that the contractor shall do the following:

- Protect stockpiles of friable material subject to wind through wetting.
- Cover loads with of friable material during transportation.
- Restrict speed on loose surface roads to 30Km/hr during dry or dusty conditions.
- Douse with water of roadways and work sites to reduce dust when necessary.

6.2.4 OPERATION PHASE

Fundamentally, most of anticipated airport operations impacts e.g. from storm water drainage, air emissions, disposal of wastes, use of natural resources (water, energy) are elaborated / mitigated under the design phase.

(i) Storm Water Runoff Management

TAA institute procedure for cleaning / de-silting and routine and periodic maintenance of the runway, storm water drainage, buildings, services supply systems and other airport facilities.

(Ii) Management of Point – Source Pollutions

TAA Institute procedures and include in recurrent budgets for replacement and repair of worn out / outdated equipments, leakages and discharges from sewerage, waste water and fresh water supply systems

(Iii) Management of Waste (Non-Hazardous and Hazardous Materials)

TAA to enforce procedures to implement mitigation measures expounded under design section 6.2.2 (iii) for management of non-hazardous solid wastes; transportation, use, storage and disposal of hazardous materials; alien species control; and management of fuels and hydrocarbons (oils, petroleum, lubricants) including Spill Prevention and Control Plan / Response and Contingency Plan.

(Iv) Availability of Resources – Financial, Human and Natural Resources

Tanzania Airport Authority includes in both recurrent and development budgets resources required to maintain the airport facilities e.g. sustained water supply and

power supply. Develop and implement in-house and training programmes for staff and out of office opportunities in relevant environmental management aspects.

In order to effectively mitigate the above impacts due to inadequacies in operations procedures and monitoring, the Tanzania Airport Authority shall support the implementation of Environmental Management Plan specific for the Kigoma airport. The aims of the Environmental Management Plan among others are to translate the recommended mitigation measures into actions on the ground. The Environmental Management Plan will provide a site management tool for the airport Manager and staff. Table 8.1 illustrates a general outline of EMP for the airport that will be improved upon completion of the airport upgrading activities.

6.2.5 DECOMMISSIONING PHASE

(I) Contamination/Impaired Quality of Receiving Body

Mitigation measure similar as explained in section 6.2.3 (II) above.

7. SOCIAL IMPACTS ASSESSMENT

7.1 IMPACTS IDENTIFICATION AND SIGNIFICANCE

7.1.1 SITE SELECTION

Site selection phase determines the overarching impacts of the presence of the project on the general socio-economic settings at the project area. The impacts are further analysed in subsequent phases and sections. In upgrading the Shinyanga airport issues of land take will not apply as there is enough land within the airport boundaries to accommodate the expansion activities. Furthermore within the land required for extensions there are no settlement features will be demolished. Thus main impacts sources relate to effects of neighbouring activities and developments.

7.1.1.1 Activities Prohibited Within Airport Boundary

- **Potential Impact**: **Compromised Airport Security**

Lack of outer boundary fence allows trespassing and a multitude of activities on airport land. From the user's point of view, the advent of a well fenced airport result in disruption of economic and social activities and services including blocked access, loss of income etc. However, the activities are illegal, constituting trespassing and compromise the airport effectiveness and security and are against both the Tanzania law and international laws and airport practices.

Furthermore, when the airport is fully operational, omission of a fence as part of the upgrading programme could cause fatal accidents especially to children/people trespassing the airport grounds. Shinyanga airport has no outer perimeter fence; its boundaries are defined by a live fence of sisal plants (planted in 2002). There are about 13 households within airport land and trespassing activities particularly farming and livestock grazing are being carried indiscriminately on airport grounds as close as a few meters from the runway.

Fig 7.1: Livestock within the Airport Premises.

Fig7.2: People Cultivating Inside the Airport Area

Some farmers (about 138 families) are discontented and claim compensations for land taken about 10 years ago. Impact associated considered as: **Positive from airport operational perspective but negative to the trespassers. Short/medium term and of moderate significance**

7.1.2 DESIGN PHASE

Main impact sources for the design phase relate to:

- Choice of Best Available Techniques (BAT), technologies, and practices (to meet both Tanzania and international Health, Safety and Environmental (HSE) standards);
- Setting management procedures for handling and disposal of wastes, health & safety procedure;
- Planning for availability of adequate resources

7.1.2.1 Exploitation of Borrow Pits/Quarries and Other Natural Resource

- **Potential Impact**: **Depletion of Resources/Public Health Risks**

There are signs of over exploitation of the commonly used construction materials from areas within economic distance from the Shinyanga Municipal center and far sites. The aggregate borrow pit at Usanda village for many years catered for various users and show signs of depletion and the Ibadakuli gravel borrow pit located within the airport grounds will be used as source of aggregate and gravel respectively . The airport project will be adding on to this already perilous situation. This means in the future contractors/builders will be forced to go further and further to obtain the construction materials.

Borrow pits in/or close to the Shinyanga municipality have pits (about 10m depth) in which water collects, thus posing health risks to people as breeding sites for mosquitoes, vector of Malaria. Impact associated considered as: **negative, secondary (indirect), cumulative, and of high significance.**

Fig 7.3: Residue Pit at Usanda one of the source of stone for Usanda Quarry

Fig 7.4: Another view of Usanda Pit at Usanda Quarry

7.1.2.2 Haphazard Disposal of Construction and Operations Wastes

- **Potential Impact: Visual Impacts / Public Health Hazards**

Main sources of construction and operations wastes are shown in table 7.1.

Table 7.1: Types and sources of construction and operations waste.

Type of waste	Sources
Vegetation and top soil (overburden)	Clearance
Rubble	Demolition of runway and airport facilities
Domestic waste: food, paper, metal parts, glass, batteries etc.)	• Construction crew • Food and refreshment centres, offices • and business centres
Fuel, oils and lubricants	• Construction equipments • Maintenance workshops /hangar • Aircraft fuelling points.

Overburden, rubble, domestic waste produced by construction activities and during airport operations if damped haphazardly becomes an eyesore, cause bad smells and reduces the aesthetic value of an area. Food waste attracts insects (houseflies, ants) and scavengers (rodents, birds, dogs, cats) some of which are potential vectors of diseases including cholera, diarrhoea etc and may create nuisance to airport users. Birds strikes cause damage to aircrafts. Some waste are non-biodegradable and/or poisonous (plastic, batteries, oils etc.) and may seep into under ground/surface water resources. Groundwater depth throughout the core study area typically ranges from 35m to 150m below the ground surface. Boreholes, shallow wells and ponds are the main source of potable water for most of the inhabitants of the airport general area.

Current measures to manage waste (collection and disposal of solid, liquid and excreta waste) and maintain the sanitation and hygiene at the airport are barely sufficient for current traffic and staffs. The airport lack proper measures for management of solid waste, being dumped in open backyard pits.

Fig 7.5: Open Backyard Pit within the Airport Premises.

Approximately 185 workers will be needed to carry out the upgrading programme. Assuming that the per capita waste generation is about 0.5 kg per day. About 67.5 tonnes of solid waste will be generated during construction. Also sewage will be generated from the occupants of the camp. Assuming that each person will use 20 litres of water and 80% of this amount is discharged as waste the amount of domestic wastewater that will be generated is about 2,100,00 litres. Impact considered as: **negative, short term high significance**

7.1.2.3 Hazards to workers

- **Potential Impact**: **Occupation Health and Safety**

Inadequacies in provisions for working conditions - safe working environment is normally assured when code of practices in the working place are instituted. Failure during the design to provide for and integrate health and safety (e.g. proper personal protective gear) and ensure there is a distribution of responsibility and accountability for health and safety to all employees at all levels may lead to accidents, injuries to workers, loss of lives and/or of property. Mobilization and construction activities are rife with activities that may cause risk of serious injuries, fatalities to workers these include motored / sharp edged equipments, explosives (if required to blast rocks) etc. Construction works use various noise-emitting heavy

power equipments and tools and engines including compressors, generator and mixing machinery. Noise is expected to be generated from vehicles and trucks transporting construction equipment and from crew and if applicable from blasting. Noise levels from hand portable drilling equipment range between 90-96 dB, and from vehicles about 65 dB. Also fire risk at base camps made of tents or thatch-roofed. Occupational health hazards may also be promoted by lack of procedures that mitigate negligence at work, fatigue due to understaffing and long working hours, employing wrong people on particular jobs (e.g. employing an unskilled person to handle dynamite explosives), lack of protective gear, low morale, etc. Impact associated considered as: **negative, short term, low high significance**

7.1.2.4. Public health and safety

- **Potential Impact: Health Hazards / Disturbances and Nuisance to Offsite Receptors**

Transportation and construction hazards to public could emanate from vehicles causing accidents, congested traffic, material spillage etc; air pollution from emissions of exhausts of trucks, equipments and dust from loose earth roads; and noise generated from vehicles and trucks transporting construction equipment and from crew. Construction works use various noise-emitting heavy power equipments and tools and engines including, compressors, generator and mixing machinery. Noise levels from hand portable drilling equipment range between 90-96 dB and from vehicles about 65 dB. Also fire risk at base camps made of tents or thatch-roofed. Occupational health hazards may also be promoted by lack of procedures that mitigate negligence at work, fatigue due to understaffing and long working hours, employing wrong people on particular job, lack of protective gear, low morale, etc. Impact considered as: **negative, short term, low high significance**

7.1.2.5 Social interactions

- **Potential Impact**: **Public Health Hazards/Safety**

Construction works and increased business opportunities at the airport will be associated with availability of employment opportunities and hasty generation of income. Therefore people with different social background will immigrate in the project area to access opportunities created. This influx of people in the project area and resultant social interactions among workers and locals is inevitable especially on the construction areas, transportation routes etc. The obvious relative wealth of the

project workers may lead to exploitative behaviour on the hosts' side Consequence of these interactions could be increased incidences of health impacts such as spread of STDs, HIV/AIDS, bleached security as well as attitudes and behaviour change to indigenous people. HIV infection rate in Shinyanga Municipality is at 7.3 %. However, airport upgrading is one among several construction works and other investments taking place in the municipality/region. Impact associated considered as: **negative, cumulative, short-term, and of moderate significance**

- **Potential Impact: Compromised Security**

Construction activities are associated with incidences of vandalism and theft of equipments and materials such as cement, explosives and other portable items that have ready-made market or for home use. Construction activities will be conducted on airport grounds which lack an outer fence this provides opportunities for people residing in nearby settlements to have easy access to construction equipment and other materials. Impact associated considered as: **negative, cumulative, short-term, and of moderate significance.**

7.1.3 MOBILIZATION / CONSTRUCTION PHASE

Main impact sources:

- Clearance of extension portions and if necessary access routes and sites for support facilities (storage, crew).
- Transportation of construction equipments, materials and labour.
- Setting up and operation of base camp
- Construction works

7.1.3.1 Vegetation Clearance

- **Potential Impact: Loss of Crops and Impairment of Landscape Aesthetics**

Clearance of vegetation will entail removal of natural vegetation found on the extension portion. These are mainly grass and probably a mature baobab tree growing about 50 m from the runway. Clearance usually affects the natural aesthetic attraction of an area; however the big portion that will be cleared is located in an already cleared area. Impact associated considered as: **negative but not be significant**

7.1.3.2 Exploitation of Local Resources and Manpower.

- **Potential Impact: Income to Local Suppliers and Service Providers**

The borrow pits and quarries either belong to private individuals, villages or are owned by the Municipal Council. The below are current prices for the various construction materials and the amounts of cash expected to gained by the suppliers of the materials.

Table 7.2: Income Expected from Exploitation of Local Resources

Type of material	Quantity Required by Project	Unit price	Total
Gravel	15,000 m^3	7,000.00	105,000,000.00
Aggregates	12,250 m^3	15,000.00	183,750,000.00
Sand	2,700 m^3	4,000.00	10,800,000.00

The Contractor and crew will also depend on other local supplies and services (food, accommodation, medicals) and employment of casual and semi-skilled labour.
Increased revenue to local councils. Impact associated considered as: **Positive, cumulative, short-term, and of moderate significance.**

7.1.4 OPERATION PHASE

7.1.4.1 Increased Aircraft Traffic

- **Potential Impact: Increased Commercial and Social Activities (Induced Development**)

Environmental impacts related to depletion of resources in the advent of the airport rehabilitation programme are highlighted under section 7.1.2.1 above. Table A1 in the annex, indicates sectors and related resource demand which the rehabilitated airport is expected to stimulate including tourism, mining, energy, agriculture, industry, and urban development.

The project will have tremendous positive impacts by stimulating various commercial and social activities. The region has yet unexploited mineral resources and agriculture potential to match increase in the investments. However, mitigation measures are required taking cognizant that the on-going upgrading of the gravelled Mwanza – Shinyanga road and Shinyanga – Kahama road to bitumen level will also open the

region to the outside. The open access mode of resource utilizations, the inability of government to restrict their use and other underlying factors, provide inadequate assurance of continued supplies of the resources for the various sectors in the longer – term. Impact associated considered as: **Positive, cumulative, long-term, and of high significance.**

7.1.4.2 Air Emissions and Noise Pollution

Potential Impact: Disturbance/ Nuisance and Public Health Hazards to Receptors

Consequence of increased airport traffic is increased noise and disturbance to residents and institutions in the approach and takeoff paths of aircrafts. Even with the best available technologies, most of the other equipments (generators) and vehicles emit gases such as CO_2, NOx, SOx, particulate matters and hydrocarbons - regarded as residual air pollution. Effects of vibrations from heavy aircrafts to nearby buildings will not be significant if the building within the vicinity are constructed applied good engineering practice. Impacts associated considered as: **negative, cumulative, long-term, and of high significance.**

7.1.4.3 Inadequacies in Operation and Maintenance

Potential impact:

- **Deterioration of Public Health And Sanitary Conditions**
- **Compromised operations due to Activities and developments within the airport and outside its boundary**

The above anticipated impacts that may occur during operation of upgraded airport are considered during design phase (section 7.1.2) so that mitigations and appropriate procedures are put in place before the airport is operational. Inadequacies in operations, enforcement and monitoring could result in adverse post- construction impacts. Main aspects of concern include:

(i) Protection of Airport from Obstacles

Lack of enforcement of measures to control trespassing, unauthorized activities and developments within the airport and outside its boundary especially under the landing and take-off paths have potential to compromise flight safety and public safety.

(ii) Availability of Resources – Financial, Human and Natural Resources

Inadequate support structures and services not part of upgrading project e.g. lack of sustained water supply, power supply and inadequate resources to maintain the airport facilities and services - may in future result in health hazards to workers and airport users and loss of aesthetics and disrupt airport operations. Water will be required for maintaining the sanitary conditions at the upgraded airport. Estimates are 20 litres / person/day. Inadequate supply has consequent health hazards from communicable diseases.

(ii) Management of Point – Source Pollutions (Air Emissions and Liquid Waste Management)

Lack of procedure for managing pollutions e.g. leakages and discharges from sewerage, waste water, waste cleaned from storage area, fuels and hydrocarbons into the surroundings may cause contaminations of fresh water supply systems and arable land in the vicinity of the airport resulting in health hazards to the users.

(Iii) **Management of Waste (Non-Hazardous and Hazardous Materials)**

Lack of enforcement of procedures put in place for collection and disposal of non-hazardous solid wastes; transportation, use, storage and disposal of hazardous materials. Waste disposal hazards including health risks and deterioration of landscape aesthetics are expounded under design section 7.1.2 above. Impacts associated considered as*:* **Negative, secondary (indirect), cumulative, and of high significance.**

7.1.5 DECOMMISSIONING PHASE

7.1.5.1 Disposal of Demolished Waste

- **Potential Impact**: **Contamination and Impaired Water**

In the event of future rehabilitations and upgrading, the runway and associated facilities may need to be demolished necessitating disposal of demolition waste. Haphazard disposal may cause contamination/impaired quality of receiving body – especially land, and water resources. Impacts associated considered as: **negative, short term and high significance.**

7.2 IMPACTS MITIGATION

Section 7.1 above has identified potential social impacts and their significance. This section provides a summary of mitigation measures of those impacts which are considered to be of moderate to high significance.

7.2.1 SITE SELECTION PHASE

(I) Disruption of Economic and Social Activities and Services

Those activities which are going on at the airport premises are illegal and are against national and international laws; also against civil aviation safety regulations. To mitigate this impact the following shall be done:

- Tanzania Airport Authority shall strive to obtain legal rights to its land (Land right of Occupancy-Title Deed)
- Enforcement of national and international laws
- Awareness rising to community within the project core area
- Inclusion of local leaders (Ward/sub-ward chairpersons/executive officers or /and councillors in the airport security and safety committee.

7.2.2 DESIGN PHASE

(I) Depletion of Resources/Conflicts with Land Owners and Resource Users

To mitigate this impact the following shall be done:

- Exploitation of construction materials shall be from the authorized source only as indicated in table 6.1.
- Re-use of the excavated soils and demolition rubbles as part of the sub base material.
- Use of water conservatively by instituting technologies (e.g. self lock water tape) and awareness raising notices to users, etc.
- Construction of under ground water reserve tank and introducing rainwater harvest system.
- Extraction of underground water resources.

(II) Visual Impacts / Public Health Hazards from Waste

To mitigate the impacts of wastes an efficient collection and disposal system based on the principles of reduction, re-use and recycling of materials, shall be

instituted at the airport. The measures are elaborated in section 6.2.2 (III). Also Tanzania Airport Authority shall practice the following:

- Introduction of waste disposal bins, warning notices, "DOs & DoNTs" etc posted at strategic points, through the airport area.
- No, on site burial or open burning of solid waste shall be permitted at the airport. Tanzania Airport Authority will make use of the existing municipal council solid waste disposal and collection system.
- Waste management training for all personnel, operators and services providers at the airport.

(III) Health Hazards / Disturbances and Nuisance from Construction Works

To mitigate this impact Tanzania Airport Authority and the Contractor shall:

- Institute good site practices including prevent public access to the construction site by securing equipment and demarcate excavate, using warning signs with appropriate text (local language) and graphics programs in schools and communities.
- Institute traffic management and safety programme including, training and testing of heavy vehicles operators and drivers, enforcement of speed limits, maximum loading restrictions and compliance with all Tanzania transpiration law and standards.
- Inform community of airport construction activities and schedules.
- Noise generating equipments, operational for short periods or during the times which they will cause less disturbances.

(IV) Public Health Hazards and Safety from Social Interactions

To mitigate this impact Tanzania airport Authority shall develop AID/HIV control program. Collaborate and support municipal public health offices (Community Development and Health Departments) and Civil Society Organization (CSOs) in awareness/education programs to workers and public.

(V) Occupation Health and Safety

To mitigate this impact, Tanzania Airport Authority and contractor shall comply with relevant Tanzania (OSHA, 2003) and International Finance Cooperation's Performance Standards and regulations on health and safety requirements including the provision of Personal Protective Equipments (PPE), reasonable

working hours and good working conditions and facilities. Also to develop and implement in-house manual/ guard lines on Health and Safety (H&S)

(V) Compromised Security due to Social Interaction

To mitigate the impact of the security Tanzania airport authority shall ensure the following:

- Outer boundary fence shall be constructed as part of this upgrading project and shall be scheduled as one of the first activities during the implementation of the project for the extended part of the airport.
- Only key construction personnel (Junior and semi skilled) to be accommodated at the site
- Enforcement of site security
- Screening of security personnel
- Prohibition of alcohol and drugs within the site

7.2.3 MOBILIZATION/CONSTRUCTION PHASE

(I) Loss of Crops and Impairment of Landscape Aesthetics

To mitigate this impact, compensation for crops will be part of the Tanzania Airport Authority Land Acquisition and Compensation Plan elaborated under section 7.2.1 above.

(Ii) Income to Local Suppliers and Service Providers

Measures for enhancement of this positive impact shall be:

- Optimization of local employment (allocate jobs fairly among the locals through involvement of local leaders) and sourcing of other supplies and services.
- Deliver skills and training
- Ensure monitoring of labour standards among contractors, sub-contractors, workers and service providers
- Municipal council in collaboration with Tanzania Airport Authority institute good revenue collection system from the Airport.

7.2.4 OPERATION PHASE

(I) Increased Commercial and Social Activities (Induced Development)

To enhance this positive impact to the community living in the vicinity and area of influence; Tanzania Airport Authority and Kagera region shall ensure:

- Efficient airport operation
- Good security within the airport area and area of influence
- Undertakes Strategic Environmental Assessment (SEA) and include in the region investment strategies and plans

(II) Disturbance and Nuisance to Receptor due to Increase of Air Traffic.

To mitigate this impact Tanzania Airport Authority shall inform community living within the project vicinity of airport activities and freight schedules.

(III) Deterioration of Public Health and Sanitary Conditions due to Inadequacy Operation and Maintenance

To mitigate this impact Tanzania Airport Authority shall ensure the following:

- Availability of adequate resource particularly money for maintenance
- Regular maintenance schedule of structures should be put in place
- Proper operational and monitoring procedures should be put in place

7.2.5 DECOMMISSIONING PHASE

(I) Contamination and Impaired of Receiving Body (Water and Land)

Mitigation measure similar as explained in section 6.2.3 (II)

(II) Loss of Revenue

To mitigate this impact Tanzania Airport authority and other organizations employee should ensure:

- Extensive training and preparations for workers for new /self employment.
- Membership to Social Security Fund.

8. POTENTIAL ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

The Environmental Management Plan provides way forward for implementation of the identified mitigation measures. Tanzania Airport Authority shall be responsible for overall implementation of the Environmental and Social Management Plan. The Contractor shall implement components relevant to mobilization and construction. Tanzania Airport Authority environmental control officer shall be designated to make day to day follow ups (e.g. supervision and liaising with stakeholders). The estimated costs for implementing the mitigation measures are shown, and should be accommodated on bills of quantities as an item. The summary of the key issues of the Shinyanga airport rehabilitation programme and their management are shown in Table 8.1

Table 8.1: Environmental and Social Management Plan

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
SITE SELECTION	Damage to airport building/erected structures and disruption of operations	• Provision of Reinforcement to the foundation/Base of the building • Use of column as structure support	Engineering Standards	Tanzania Airport Authority, consultant & contractor	Project Cost
	Disruption of economic and social activities and services	• Construct of outer boundary wall. • Awareness rising to community • TAA obtain Title Deed • Inclusion of local leader in Airport security and safety committee • Enforcement of National & International laws • Relocation of electrical and telephone poles	ICAO standards Aerodromes act	Tanzania Airport Authority , Consultant and Contractor	Project Cost

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
DESIGN	Depletion of resources/conflicts with land owners and resource users	• Exploitation from the authorized source only • Restoration of the borrow pits/quarries after use in association with local government and environmental NGOs • Levelling the area and Plantation of trees and grasses.	None	Tanzania Airport Authority & contractor	• Exploitation : part of the project cost • Restoration of borrow pits: 30,000.00 • Levelling and Plantation of trees and grasses: part of the project costs:
	Damage to rehabilitated structures due to ineffective storm water drainage and overflows.	• Proper hydrology analysis • Proper design • Construction of storm water drainage	• Engineering standards • No Flood • No Erosion	Tanzania Airport Authority, Consultant and Contractor	Project costs

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Exploitation of Borrow pits/Quarries and other nature resources	• Exploitation of construction materials from authorized sources only. • Restoration of borrow pits/ quarries after use by levelling, seeding and or planting of trees and/or grasses. • Maintenance of construction equipments in good running conditions. • Refuelling restriction at the workshop/base camp	None	Tanzania Airport Authority, Contractor and Shinyanga Municipal council	Restoration cost: 10,000.00

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Contamination and Impaired Quality of Receiving Body-Land and Water	• Use excavated soil and rubbles to fill openings and to cover haphazard disposed municipal waste. • Introduce of waste disposal bins, warning notices. • Training to personnel, operators and services providers about waste management. • Liquid waste will be collected initially in cesspit tanks at the airport area and later disposed through municipal waste management system. • Introduction of regular monitoring system for waste collections and disposal.	• No overburden left on construction site • As minimum as possible	Tanzania Airport Authority, Contractor and Shinyanga Municipal council for monitoring	• Monitoring and Training cost: 10,000.00
	Deteriorated/Impaired of Local Air quality due to Emission Generated from Construction Equipment	• Maintain Equipment in good running condition • Enforce vehicle road restrictions • Routine inspection of equipments	• As minimum as possible	Tanzania Airport Authority and Contractor	Project costs

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Depletion of Resources/Conflict with Land owners and Resource Users	• Exploitation from authorized areas only • Re-use of excavated soils and rubbles • Use of water conservatively • Introduction of rain harvest system • Extraction of underground water resources	None	Tanzania Airport Authority, Contractor and Shinyanga Municipal Council	
	Visual impacts / Public health hazards	• Introduce of waste disposal bins, warning notices. • Training to personnel, operators and services providers about waste management.	None	Tanzania Airport Authority and Shinyanga Municipal Council	TAA budget and municipal budget

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Health Hazard/Disturbance and Nuisance from Construction Works	• Prevent public access to the construction site • Institute traffic management and safety programme • Inform community of on going airport construction activities and schedule • Scheduled Noise generated equipments	Tanzania Ministry of Health and WHO standards	Tanzania Airport Authority, Contractor and Shinyanga Municipal council	Project cost
DESIGN	Public Health Hazard and Safety from Social Interaction	Develop HIV/AIDS program	Tanzania AIDS/HIV Policy	Tanzania Airport Authority, Shinyanga Municipal Council and Local Civil Society Organizations	Cost as presented on HIV/AIDS Program

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Occupation health and safety	• Comply with relevant Tanzania (OSHA, 2003) and International Finance Cooperation's Performance Standards and regulations on health and safety requirements. • Develop and Implement in- house manual/guard lines on Health and Safety	None	Tanzania Airport Authority and Contractor	Project costs
	Compromised Security due to Social Interactions	• Construction of outer boundary • Only key personnel accommodated to the camp site • Enforcement of site security • Screening of security personnel • Prohibit of alcohol and drugs at the camp site	• No vandalism case	Tanzania Airport Authority and Contractor	Project costs

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
Mobilization/Construction	Destruction of vegetation cover / loss local biodiversity from vegetation clearance	• Indigenous vegetation in areas that will not be impacted by the project shall not be disturbed • Rehabilitation by planting grasses to all areas that will not be occupied by runway, taxiway, apron, buildings and other airport facilities on the project site • Avoid planting non-native and exotic species on the sit	None	Tanzania Airport Authority and Contractor	Project cost
	Deteriorated/Impaired of Local Air Quality due to Emission Generated from Construction Equipments	Mitigation similar as in Design Part 6.2.2 (IV)	None	Tanzania Airport Authority and Contractor	Project cost

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Contamination/Impairment of Quality of Receiving Bodies from Fuel, Oils, Lubricate Spillages/Leakage	• Routine maintenance and checks of contractor's equipments. • Training of personnel in proper storage, handling and clean up of contaminating materials into the environment • Storage and routine handling of fuel, lubricants, oils and other potentially contaminating materials to occur in weather protected areas equipped with secondary contaminant system for spills as appropriate.	None	Tanzania Airport Authority, Contractor and Shinyanga Municipal Council for monitoring	Monitoring cost: 10,000.00
	Damage/Disturbance to Sub-surface organisms	Contractor and Tanzania Airport authority during construction shall make sure that only those areas need to be excavated are ones excavated and backfilled after construction.	None	Tanzania Airport Authority and Contractor	Project cost

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Damage/Erosion of exposed Surfaces	• Contractor and Tanzania Airport authority during construction should make sure that construction will be as per engineering design and procedure; of which a minimum requirement of compaction strength is achieved during the construction. That is maximum dry density (MDD) specified in the design manual by consultant. • Divert runway water away from structures • Maintain gravel fill and/or re-vegetation around the structures	None	Tanzania Airport Authority and Contractor	Project cost
	Impairment of air quality due to dust	• Contractor should use water sprinkler when clearing land. • Protect stockpile of friable material subject to wind through wetting • Cover load with friable material during transportation • Restrict speed on loose surface roads to 30km/hr	None	Tanzania Airport Authority and Contractor	Project cost

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Loss of Crops and impairment of Landscape Aesthetics	Crops and land to be compensated by the project prominent	Number and serious of claims	Tanzania Airport Authority	Tanzania Airport Authority-budget
	Income to local suppliers and service providers	• Optimizations of local employments • Deliver skills and training • Ensure monitoring of labour standards among contractors, sub-contractors and service provider • Institute good revenue collection system	None	Tanzania Airport Authority and Shinyanga Municipal Council	
Operation	Disrupted airport operations due to lack of maintenance of facilities and structures	• Availability of adequate resource particularly money for maintenance • Regular maintenance schedule • Proper operational and monitoring procedures • Enforcement of all regulations instituted by the airport • Monitoring and reporting for routine maintenance, repairs, replacement of all environmental sensitive areas.	As efficient as possible	Tanzania Airport Authority	Normal operation budget

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Impaired quality of receiving body (land and water) due to lack of maintenance of facilities and structure	• Regular maintenance schedule of airport facilities • Proper waste management collection and disposal schedule	As efficient as possible	Tanzania Airport Authority	Normal operation budget
	Deterioration of public health and sanitary conditions	• Availability of adequate resource particularly money for maintenance • Regular maintenance schedule • Proper operational and monitoring procedures	As efficient as possible	Tanzania Airport Authority	Normal operation budget
	Increase Commercial and Social Activities (Induced Development)	• Efficient airport operation • Good security within the core and area of influence • Undertake strategic environment assessment	None	Tanzania Airport Authority and Shinyanga Regional Secretariat	Normal operation budget
	Disturbance and Nuisance to Receptor due to Increase of Air traffic	Information to community living within the airport vicinity on airport activities and flight schedules	None	Tanzania Airport Authority	Normal operation budget

Phase	Potential Direct Impacts	Management/Mitigation Measures	Target Level/Standard	Responsibility	Estimated Costs [USD]
	Deterioration of Public Health and Sanitary Conditions Due to Inadequacy Operation and Maintenance	• Availability of adequate resource particularly money for maintenance • Regular maintenance schedule • Proper operational and monitoring procedures	As efficient as possible	Tanzania Airport Authority	Normal operation budget
Decommissioning	Loss of jobs	• Extensive training and preparations for workers for new /self employment. • Membership to Social Security Fund Bodies (System)	None	Tanzania Airport Authority and other airports related services provider, like Tanzania Civil Aviation Authority, Tanzania meteorological agency, etc	Normal operation budget
	Contamination/Impaired Quality of Receiving Body	• Proper handling and disposal procedure for solid and liquid waste	None	Tanzania Airport Authority	Not known

9. ENVIRONMENTAL & SOCIAL MONITORING PLAN

Environmental and social monitoring plan (Table 9.1) provides the application of Environmental Management Plan as well as dealing with ad hoc or unforeseen issues which need to be mitigated. Detailed on parameter to be monitored have been considered along with costs estimates and responsible institution(s).Table 9.1 summarises key environmental and social monitoring issues of the Shinyanga airport rehabilitation project.

Table 9-1: Environmental and Social Monitoring Plan

Phase	Potential Direct Impact	Parameter to be Monitored	Monitoring frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (USD)
SITE SELECTION	Damage to airport building/erected structures and disruption of operation	Number of Incidents	Twice per year	Project area	Incidence	As minimum as possible	Tanzania Airport Authority	
	Disruption of economic and social activities and services	Number of affected people and resettled	Just before construction and once every year after construction	Project area	Number of affected individual	All affected people are compensated ; according to the Land Act of 1999	Tanzania Airport Authority	
DESIGN	Depletion of resources/conflicts with land owners and resource users	Number of Incidents	Regular during construction	Quarries, Borrow pits and Water source	Incidence	No conflict at all	Tanzania Airport Authority, Contract and Municipal council	
	Damage to rehabilitated structures due to ineffective storm water drainage and overflows.	Storm water collection system	Once every year	Project area	None	No effect at all	Tanzania Airport Authority	

Phase	Potential Direct Impact	Parameter to be Monitored	Monitoring frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (USD)
	Exploitation of Borrow pits and other nature resources	Area exploitation and level of water	Frequently During construction	Construction materials and water sources	Meter cube	Level to water not to be less than the permitted level and exploited area as minimum as possible	Tanzania Airport Authority and Municipal Council	
	Contamination and Impaired Quality of Receiving Body- Land and Water	Number of incidents	Continuously during the project life	Project area	Numbers	As minimum as possible	Tanzania Airport Authority, Contractor and Municipal Health Officer	
	Deteriorate/impaired of Local Quality due to Emission Generated from Construction Equipments							
	Depletion of Resources/Conflict with Land Owner and Resources Users	Claims and seriousness of claims	Frequently during construction period	Borrow pits	Number	Not at all	Tanzania Airport Authority; Municipal Council and Contractor	

Phase	Potential Direct Impact	Parameter to be Monitored	Monitoring frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (USD)
	Visual impacts / Public health hazards	Number of affected individual	Every month during project construction and after every six month during operations	Project area	Number	As minimum as possible	Tanzania Airport Authority, Contractor and Municipal health officer	
	Health Hazard/Disturbance and Nuisance from Construction Work	Number of affected individual	Every month during project construction and after every six month during operations	Project area	Number	As minimum as possible	Tanzania Airport Authority, Contractor and Municipal health officer	
	Occupation health and safety	Availability of protective gears	Once every month	Construction site	None	All workers use protective gears	Tanzania Airport Authority and Contractor	Project cost
	Compromised Security due to Social Interactions	Incidence	Frequently	Project area	Incidence	No burglary at all	Tanzania Airport Authority	Operation cost

Phase	Potential Direct Impact	Parameter to be Monitored	Monitoring frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (USD)
MOBILIZATION/CONSTRUCTION	Destruction of vegetation cover / loss local biodiversity from vegetation clearance	Impacted ecological features	Frequently during construction	Project area	m^2	As minimum as possible	Tanzania Airport Authority and contractor	Project cost
	Contamination/Impairment of quality of receiving Bodies from Fuel, Oils, Lubricate, Spillages/Leakage	Number of incidents	Continuously during the project life	Project area	Numbers	As minimum as possible	Tanzania Airport Authority, Contractor and municipal health officer	
	Damage/Disturbance to Sub-surface organisms	Impacted ecological features	Frequently during construction	Project area	None	As minimum as possible	Tanzania Airport Authority and Contractor	Project cost
	Damage/Erosion of exposed Surfaces	Damage/Soil erosion tendencies	Twice every year	Project area	None	As minimum as possible	Tanzania Airport Authority	Project cost
	Impairment of air quality due to dust	Concentration of pollutants in ambient air (dust, noxious gas)	Once every month	Project area	ppm, mg/m^3,	Tanzania, WHO standards	Tanzania Airport Authority	
	Loss of crops and Impairment of Land Aesthetics	Number of complains and seriousness of complain	Before implementation of the project	Project Area	Number of people paid, Amount of money paid and period taken to be paid.	All affected people are compensated ; according to the Land Act of 1999	Tanzania Airport Authority	

Phase	Potential Direct Impact	Parameter to be Monitored	Monitoring frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (USD)
	Income to local suppliers and service providers	Number of employed people and services providers	Once after every three month	Project area	Number	As maximum as possible	Tanzania Airport Authority	
OPERATION	Disrupted airport operations due to lack of maintenance of facilities and structures	Performance of the facilities	Once per year	Sumbawanga airport (Project area)	None	Good performance record	Tanzania Airport Authority	
	Impaired quality of receiving body (land and water) due to lack of maintenance of facilities and structure	Number of incidents	Continuously during the project life	Project area	Numbers	As minimum as possible	Tanzania Airport Authority, Contractor and municipal health officer	
	Deterioration of public health and sanitary conditions	Number of affected individual	Every month during project construction and after every six month during operations	Project area	Number	As minimum as possible and all affected individuals are attended	Tanzania Airport Authority, Contractor and municipal health officer	

Phase	Potential Direct Impact	Parameter to be Monitored	Monitoring frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (USD)
DECOMMISSIONING	Loss of jobs	▪ Number of employers registered in social security schemes ▪ Remittance of monthly contribution	Once every six month	Tanzania Airport Authority Headquarter and Headquarters of other associated services provider.	▪ Number of employers registered in social security schemes ▪ Remittance of monthly contribution	All workers	Tanzania Airport Authority and other airport services providers	
	Contamination/Impaired Quality of Receiving Body	Number of incidents	Continuously during the project life	Project area	Numbers	As minimum as possible	Tanzania Airport Authority, Contractor and municipal health officer	

10 COST BENEFIT ANALYSIS

10.1 FINANCIAL COST BENEFIT ANALYSIS TO THE AUTHORITY

Cost-benefit analysis is normally done in the framework of feasibility study of an activity. The aim of cost-benefit analysis is to inform assist the project developer to make a decision on:

- Whether it makes economic sense to continue with the project;
- Whether the chosen option is cost effective alternative;
- The estimate of the size of a project.

In this project the costs of the Shinyanga airport rehabilitation project will include:

- Capital expenditures
- Operating and Maintenance costs;
- Staff costs;
- Materials;
- Research and Development; and
- Environment, Health and Other social costs.

Benefits may include:

- Better, understanding of the target resource;
- Accurate targeting of the resource to avoided unnecessary costs to extract the resources;
- Potential for additional revenues generated from new resources;
- Protection of environment and health; and
- Provision of other social benefits.

10.2 QUANTIFIABLE AND NON-QUANTIFIABLE BENEFITS TO COMMUNITIES

There will be direct and indirect benefits to the communities as follows:

a) The project will employ about 200 for the construction and about 20-25 personnel for the airport operation. The majority of the non-skilled labour will be recruited from the communities around the project. A good number of skilled staff will be recruited from within Tanzania.

b) Through taxes to the Government, Tanzania Airport Authority will be indirectly contributing to development projects such as roads, medical care and education services.
c) The presence of Airport in the area has drastically increases business opportunities in the area, hence increase revenue.

10.3 QUANTIFIABLE AND NON-QUANTIFIABLE BENEFITS TO GOVERNMENT

The government of Tanzania will directly benefit from taxes collected from passengers, foreign and local investors will be investing to the region. Apart from tax generation, the investment will also enhance the economic growth and ancillary private sector development spurred by the operations and activities associated with the airport. The image of the government in investment sector will also be enhanced nationally and internationally that will increase attractions from other local and foreign investors and ensure continued economic growth.

10.4 POSSIBLE COSTS TO COMMUNITIES

It is a fact that airport rehabilitation entails social and environmental impacts. These have been elaborated clearly in Chapters 6 – 9. There will be individual in the communities who will be affected more than others. However, Tanzania Airport Authority is committed to mitigate the negative social and environmental impacts.

10.5 POSSIBLE COSTS TO GOVERNMENT

Tanzania Airport Authority is the government institution and in this project is the representative to of government. Therefore all environmental and social impact that has been identified in chapter 6-8 will be direct costs to the government.

10.6 ENVIRONMENTAL COST BENEFIT ANALYSIS

Environmental cost benefit analysis is assessed in terms of the negative versus positive impacts. Furthermore, the analysis is considering whether the impacts are mitigatable

and the costs of mitigating the impacts are reasonable. As it has been mentioned in Chapters 6 – 9, the potential benefits of the project, in terms of financial and social benefit are substantial. The environmental impacts are reasonably mitigatable and the financial resources needed to mitigate negative impacts, when compared to the required investment, are relatively small.

10.7 SOCIAL ECONOMIC COST BENEFIT ANALYSIS

Availability of modern and good airport in the regions is expected to accelerate social economic development. There are several governmental initiatives such as the attraction of foreign and local investors to the regions which can not be realised without reliable mode of transport. If reliable transport is established, one should expect more investments to be established and thus create employment for the communities.

11. CONCLUSION AND RECOMMENDATIONS

11.1 CONCLUSIONS

The environmental Impact Assessment (Environmental Issues) Study has been completed in accordance with the Tanzanian Legislations including the Environmental Management Act (2004), the Environmental Impact Assessment and Audit regulations (2005). The Environmental Studies Team has carried out field surveys to collect the environmental and some social data and to discuss with the regional and local authorities concerning the environmental issues of the proposed rehabilitation of Shinyanga airport and the proposed mitigation measures. The environmental team also carried out consultation with the representatives of the local communities around the project area to integrate their requirements in the project. Also this consultation enabled the Consulting team to have a physical feeling of the local conditions around the project site.

The Environmental Impact Assessment Report has identified a number of impacts both positive and negative and other residual cumulative issues pertaining to the proposed rehabilitation of Shinyanga airport project developed in Ibadakuli, Shinyanga region by Tanzania Airport Authority on behalf of government of Tanzania. The issues/impacts have been described and assessed in detail to gain adequate understanding of possible environmental effects of the proposed project – from site selection to decommissioning, in order to formulate mitigation measures in response to negative aspects which have emerged. The Environmental Management plan provides way forward for implementation of the identified mitigation measures.

The estimated costs for implementing the mitigation measures are just indicative. The consultant has used informed judgment to come up with these figures.

The study concludes that although the project can have significant and wide-ranging impacts on the environment, the project is environmentally suitable and socially acceptable subject to the implementation of the Environmental Management Plan and Environmental Monitoring Plan as proposed in chapter 8 and 9.

11.2 RECOMMENDATIONS

It is recommended that based on the findings of the Environmental Impact Assessment exercise and supplementary information, the project proponent (Tanzania Airport Authority) should implement the environmental management plan. The environmental management plan provides guidelines on managing/mitigation of impacts and monitoring performance.

In addition to the environmental management plan, it is recommended that Tanzania Airport Authority should appoint an environmental control unit which will be responsible for monitoring the application of the environmental management plan, as well as dealing with *ad hoc* or unforeseen issues which need to be mitigated.

While a number of environmental impacts have been identified and assessed, none of these are considered to be that severe after mitigation as to prevent the further planning, design and construction of the proposed development.

Belva Consult Limited of Dar es Salaam, Tanzania and Sir Fredrick & Partners Limited of United Kingdom are of the opinion that the environmental impacts identified may be mitigated. The proposed environmental management plan and environmental monitoring plan if implemented will safeguard the integrity of the environment.

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19. Transport Policy (2002)

ANNEXES

ANNEX I

REQUIREMENT OF NATURAL RESOURCES BY DIFFERENT DEVELOPMENT SECTORS

Table A 1 below indicate the different kinds of natural resources/systems that the different development sectors requires as raw materials or support services to maintain sustained production. It has not been possible to work out the exact amounts that are currently available *(resource base),* amounts that are actually being used or the futures needs because of lack of information about the resources and ecosystems and extent and trends of their utilization. Drawing from the table, the different sectors are currently dependant on resources which could be limited in the longer-term. In line with the Tanzania growth strategy, the government is proposing/implementing aggressive industrial growth and other economic development strategies in a bid to become a middle-income country by 2025. At the current levels of economic growth (about 5% annually), Gross Domestic Product (GDP) contribution from environmental products and services and natural resources will need to increase and the pressures on the resources and environment will collate with this economic output.

Table: A1 Natural Resources Required by Different Development Sectors

Fisheries Sector (marine and freshwater) *Inshore, prawn, offshore*	**Forestry Sector** *Mangrove and coastal forests (upland)*
• Fish stocks • Intertidal areas (fishing grounds) • Fishing grounds (deep waters) • Mangrove areas (breeding/nursery areas) • Land (for infrastructure, markets • Beaches (landing site)	• Fuel-wood • Poles • Timber • Non–forested areas (reforestation)
Agriculture Sector Rain-fed subsistence, Rain-fed large scale, Irrigation	**Aquaculture Sector** Fauna: large scale (shrimp); small scale

	(crabs, shrimp, finfish, oysters)
Arable land Wetland Fresh water	• Land (reclaimed) • Land (infrastructure) • Inter-tidal areas • Beaches (landing sites) • Fresh water • Brackish water • Stock (natural recruitment) • Natural seeds
Tourism Sector Infrastructure Recreational Souvenirs	**Industry Sector**
• Fresh water • Land • Seafood, wildlife meat • Sporting grounds • Beaches • Pristine habitats • Marine species (shells, trophy etc.	• Fresh water • Land • Non-forested mangrove areas
Energy Sector Gas and oil (exploration & exploitation) Hydropower	**Urban Development**
• Fresh water • Land (processing + transmission) • Marine ground (Benthos	• Land • Food (seafood + agro) • Water • Fuel wood • Beaches • Intertidal areas (water sporting)
Wildlife Sector	
• Land • Water	

ANNEX II

TEMS OF REFERENCE

1 Introduction

During scoping several key environmental issues of concern were identified after holding consultations with stakeholders of the project and also after reviewing various literature related to the project. The outcome of the scoping exercise is the scoping report which is the basis of the draft terms of reference.

The purpose of Terms of Reference (TOR) therefore, is to provide formal guidance to the Proponent /EIA Consultant of the Shinyanga Airport project on the range of issues that must be addressed in the EIA process. They form the basis for subsequent review process. In these Terms of reference, strategies for addressing the issues identified during scoping have been in cooperated to make the EIA focused.

2 Objectives of the EIAs Study

Construction and Rehabilitation of airport activities are included in the mandatory list of the projects that are required to develop full EIA by the Environmental Management Act No 20 of 2004. Part IV 0f EIA regulations G.N. 349 of 2005 provides the general objectives for carrying EIA, among others list comprise the following:

- To ensure that environmental considerations are explicitly addressed and incorporated into the development decision making process.
- To anticipate and avoid, minimise or offset the adverse significant biophysical, social and relevant effects of development proposal.
- To protect the productivity and capacity of natural ecosystems and ecological processes which maintain their functions.
- To promote development that is sustainable and optimises resources use and management opportunities.

Consequently, Tanzania Airport Authority would like to undertake Environmental Assessment so as to translate the principles of sustainable development and

environmental protection into strategies and actions that can be practically applied to her project of rehabilitation and expansion of Shinyanga airport.

The objectives of the EIA are:

- To establish baseline information on both natural and built environment including socio-economic conditions of the proposed project area.
- To identify, predict and evaluate foreseeable impacts, both beneficial and adverse, of the proposed investment; and
- To develop mitigation measures that aim at eliminating or minimising the potential negative impacts and promote positive ones.
- To develop management clauses and monitoring aspects to be observed during project implementation.

This requirement clearly presents a broad challenge on what type of activity that is environmentally friendly need to be dealt with at Shinyanga airport and associated areas in the Shinyanga municipal.

3 Description of the Project

Tanzania airport authority (TAA) on behalf of the government proposed rehabilitation and expansion of Shinyanga airport. Currently Shinyanga airport is in good, both scheduled and charted flights are using the airport. Therefore TAA intend to rehabilitate and expand the airport to accommodate ATR72 as a maximum aircraft of which 2000 x 30 m of runway will be constructed, included taxiway and apron.

In future TAA intend to construct a modern terminal building which will be of the same capacity and standard with that rehabilitate airport.

4 Scope of Work.

The EIA shall be conducted in accordance to the guidelines laid down by the Environment Management Act (EMA, 2004). The main steps to be followed by the Consultant in the environmental impact assessment will involve:

4.1 Identifying, collecting and analyzing information which includes:

- Project characteristics and activities;
- Baseline data of the environmental and socio-economic setup;
- Predicting impacts;
- Evaluating impact significance:
- Identifying and proposing mitigation measures:
- Preparing the Management and Monitoring Plan and Follow up; and
- Presenting the information which involves writing an environmental Impact Assessment Statement (EIS).

4.2 The Consultant shall carryout the following tasks:

4.2.1. Stakeholders Consultations

Consultations with stakeholders have been undertaken in this scoping stage of the EIA. Main stakeholders and their concerns are elaborated under chapter 5. *The Consultants shall* carry this further during the impact study.

4.2.2. Baseline Data and Information

4.2.2.1 Study area

In order to cover assessment of all key issues related to the project, the study area should be much wider than at Shinyanga airport area were many of the project facilities and services will be located. This is because some of the impacts might have local, regional or national implication. The Consultant shall, further determine and set the project boundaries particularly spatial boundaries (i.e. impact area coverage and area of influence).

4.2.2.2 Description of the project

The Consultant shall give details of:

- Location of all project-related development and operation sites;
- General layout of airport, design basis, size, capacity;
- Pre-construction activities and construction activities;
- Organizational relationships, mandates and interactions among the different parties to be involved in the project.

4.2.2.3 Description of the Environment

The Consultant shall:

- Provide general description of the project environment and sources of information for anyone requiring a more extensive description (especially the EIA reviewers);
- Identify those features that are particularly important in the project area;
- Maps at appropriate scales to illustrate the surrounding areas likely to be environmentally and social affected.
- Identify areas that require special attention in the project implementation. The areas may represent unique or sensitive geomorphologic characteristics, biotopes, or species.

Environmental Impact Assessment shall specifically focus on these ecological components to ensure that the proposed development does not harm the well being or these characteristics.

5 Legislative and Regulatory Considerations.

The scoping report has identified some of the policies and legislation.

The Consultant shall describe how relevant the identified local, national and international regulations and standards governing environmental quality, health and safety, protection of sensitive areas and endangered species, land use control etc. in relation to the project activities.

6 Impact Assessments

Below are listed tasks to be undertaken by the consultant during EIA, using baseline data and information gathered. Extent to which each will be undertaken will depend on the issues identified during scoping. The consultant will strive to balance the tasks in order to achieve the described objectives of the EIA.

To avoid ambiguity in the impact assessment (identifying potential impacts, relevant environmental factors and mitigative measures) the Consultant shall make use of the checklist covering the major areas of impact as provided for in the EIA guidelines.

6.1 Task 1: Identification and Prediction of Impacts.

Under this activity the consultant shall:

- Identify issues and concerns in order to find suitable remedies;
- Identify linkages among project components and the issues;
- Identify where project activities or elements interact with social and biophysical environment (direct impacts);
- Identify indirect impacts of the project on the environment;
- Identify cumulative impacts that may be anticipated;
- Identify residual impacts if any;
- Predict probability, magnitude, distribution and timing of expected impacts;

6.2 Task 2: Estimation of the Significance of the Impacts.

The consultant shall:

- Determine which environmental components are mostly affected by the project or its alternatives;
- List issues raised by the public and classify them according the level and frequency of concern whenever possible;
- List regulatory standards, guidelines etc. that need to be met; and
- Rank predicted impacts in order of priority for avoidance, mitigation, compensation and monitoring.

6.3 Task 3: Development of Management Plan to Mitigate Negative Impacts, and Development of Monitoring Plan.

The consultant shall:

- Determine appropriate measures to avoid or mitigate undesirable impacts;
- Assess and describe the anticipated effectiveness of proposed measures;
- Ascertain regulatory requirements and expected performance standards;
- Determine and assess methods to monitor impacts for prediction accuracy remedial measures for effectiveness;
- Determine and assess methods to monitor for early warning of unexpected effects;
- Re-assess project plans, design and project management structure;
- Describe follow-up scheme and post-project action plan for achieving EIA objectives; and
- Assess the level of financial commitment by the project proponent for the management and monitoring plan, and follow up activities.

The consultant shall be guided by the cost-effectiveness principles in proposing amelioration measures. Estimation of costs of those measures shall be made. The assessment will provide a detailed plan to monitor the implementation of the mitigation measures and impacts of the project during construction and operation.

6.4 Task 4: Identification of Institutional Needs to Implement Recommendations.

The Consultant shall review the institutional set-up - community, ward, District/ Regional and national levels - for implementation of the Management and Monitoring Plans recommended in the environmental assessment. The assessment shall identify who should be responsible for what and when.

6.5 Task 5: Drawing Recommendations.

The consultant shall:

- Highlight key concerns and considerations associated with the acceptance and implementation of recommended actions;
- Determine resources requirements for implementing recommendations;
- Determine capacity and resourcefulness of the client to meeting such commitment;
- Explain rationale for proposed development and benefits and costs vis-à-vis the no-project option;
- Ascertain degree of public acceptance of or reaction to recommendations.

6.6 Task 6: Environmental Impact Statement (EIS).

The assessment shall result into an EIS focusing on findings of the assessment, conclusions and recommended actions, supported by summaries of data collected etc. This shall be a concise document limited to significant environmental issues. The report format will be as per NEMC EIA guidelines.

6.7 Task 7: Review

The review report from NEMC may require further input (data collection, consultation inputs etc.). The consultant shall undertake to provide extra information and inputs until the project review is satisfactorily concluded.

7 Peoples Participation

The assessment shall establish the level of consultation of the affected stakeholders before designing the project, level of involvement in the running and maintenance of the project facilities as this is an important aspect for both environmental and project sustainability.

The assessment will provide a framework:

- For coordinating the environmental impact assessment with other government agencies, Marine Parks and Reserves; and
- For obtaining the views of affected groups, and in keeping records of meeting and other activities, communications, and comments and their disposition.

A people's participation report will be prepared as part of the EIS i.e. apart from the socio- economic and cultural impact report (which basically are dealing with consultant's perception and interpretation of issues).

8 Study Team

The consultants shall deploy consultants/experts with the demonstrable practical experience in conducing EIA studies. Specific experience in civil works, ecology and sociology.

9 Reporting and Report Presentation

The final draft of the EIS document should be concise, following the report writing guidelines in the National EIA Procedure and Guidelines (NEM, Draft 1997), for simplifying the review process.

10 Records of Meetings

The consultants shall provide record of the names of organizations, government and departments and individuals whose views will obtain. The record will also provide description of views and information that will be obtained.

11 References

The objective of this section is to identify and record the written materials used in the study. This is extremely important because some of the material used as back ground information may be in unpublished form, and yet it may be necessary that these are Available during the review process

ANNEX III

PUBLIC NOTICES AND ADVERTISEMENTS

ATTENTION! ATTENTION! ATTENTION!

PUBLIC NOTICE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF REHABILITATION AND UPGRADING OF SHINYANGA AIRPORT PROJECT

Tanzania Airport Authority (TAA) intends to undertake a project for the rehabilitation an upgrading of Shinyanga Airport as part of the national effort to upgrade high priority commercial airports across the country. The Shinyanga airport project will involve rehabilitation and extension of gravelled surfaced runway of 2,240m x 30m, apron and taxiways to a surfaced bitumen standard.

On behalf of TAA, M/S Sir Fredrick Snow & Partners Ltd of UK in association with BELVA Consult Limited of Tanzania are undertaking a study of the impacts of the project to the existing environment, and social and economic set ups as required by the government (Environmental Management Act No 20, 2004).

If you have any issue or concern regarding this project, express/send them to the below offices where details of the project are also found.

- Director General
  Tanzania Airport Authority (TAA)
  Julius Nyerere International Airport – Terminal I
  P. O. Box 18000, Dar es Salaam, Tanzania
  Tel. 255-22-2842402/3, Fax: 255-22-2844495.
  Email info@airports.go.tz

- EIA Consultants, Belva Consult Ltd, P.O Box 75212 Dar es Salaam, Tel: 255-22-2775919, Fax: 255-22-2775910, *Email:* belva@bol.co.tz, *Director*: 255-754-270400, 0754 291997

- Director General, National Environmental Management Council (NEMC), P.O Box 63154 Dar es Salaam, Tel: 255 (022) 2127817, 0713 608930, *Email:* nemc@nemctz.org

Also to

- The Shinyanga Regional Secretariat, Shinyanga Municipal Executive Director; Executive Officers & Chairpersons at Ward and "Mtaa" levels.

ATTENTION! ATTENTION! ATTENTION!

ILANI! ILANI! ILANI!

TANGAZO

TATHIMINI YA ATHARI KWA MAZINGIRA NA JAMII: MRADI WA UKARABATI NA UPANUZI WA KIWANJA CHA NDEGE SHINYANGA

Mamlaka ya Viwanja vya Ndege Tanzania (TAA) inakusudia kufanya ukarabati na upanuzi wa Kiwanja cha ndege cha Shinyanga ikiwa ni sehemu ya uboreshaji wa viwanja vya ndege vyenye umuhimu wa kibiashara kitaifa. Mradi huu utahusisha ukarabati na upanuzi wa njia ya kutua na kuruka ya changarawe ya 2,2400m x 30m kuwa kiwango cha rami.

Kampuni ya M/S Sir Fredrick Snow & Partners Ltd ya Uingereza ikishirikiana na Belva Consult Ltd ya Tanzania, kwa niaba ya TAA, wanafanya tathmini ya athari ya mradi huu kwa mazingira na jamii, kama ilivyoagizwa na serikali (Sheria ya Mazingira Na. 20 ya 2004).

Kama una maoni kuhusu huu mradi unaweza kuyatoa/kuyatuma katika ofisi zifuatazo:

- Mkurugenzi Mkuu
  Tanzania Airport Authority (TAA)
  Uwanja wa Ndege wa Kimataifa wa Julius Nyerere – Terminal I
  S.L.P 18000, Dar es Salaam, Tanzania
  Simu. 255-22-2842402/3, Fax: 255-22-2844495.
  Barua Pepe info@airports.go.tz

- Washauri, Belva Consult Ltd, S.L.P 75212 Dar es Salaam, Simu: 255-22-2775919; Fax: 255-22-2775910; Mobile: 255-754-270400, 0754 291997; Barua Pepe: *belva@bol.co.tz*

- Mkurugenzi Mkuu, Baraza la Taifa la Usimamizi na Hifadhi ya Mazingira, S.L.P 63154 Dar es Salaam, Simu: 255 (022) 2127817, 0713 608930, Barua Pepe: *nemc@nemctz.org*

Au Kwa

- Secretarieti ya Mkoa wa Shinyanga; Mkurugenzi Mtendaji wa Manispaa ya Shinyanga; Afisa Watendaji na Wenyeviti wa Kata na Mitaa.

ILANI! ILANI! ILANI!

ANNEX IV

LIST OF STKEHOLDERS CONSULTED