THE UNITED REPUBLIC OF TANZANIA

ENVIRONMENTAL IMPACT ASSESSMENT GUIDELINES

BUILDING CONSTRUCTION SECTOR

The **National Environment Management Council** (NEMC), Tanzania would like to acknowledge **Centre for Science and Environment** (CSE), New Delhi for their support in the preparation of these guidelines for building construction sector.

The council would also like to take this opportunity to thank the following bodies that were consulted during the drafting of these guidelines:
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National Housing Corporation
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Tanzania Environmental Experts Association (TEEA)
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Acronyms and abbreviations

1. APMC—Air Pollution Control Measures
2. CBD —Convention on Biological Diversity
3. CBOs—Community Based Organisations
4. CETP—Common Effluent Treatment Plant
5. CFC—ChloroFluoro Carbons
6. CFL—Compact Fluorescent Lamp
7. C&D Waste—Construction and Demolition Waste
8. CSE—Centre for Science and Environment
9. CSR—Corporate Social Responsibility
10. DG—Diesel Generator
11. ECC—Environmental Clearance Certificate
12. ECS—Equivalent Car Space
13. EIA—Environmental Impact Assessment
14. EIS —Environmental Impact Statement
15. EMA — Environmental Management Act
16. EMP—Environmental Management Plan
17. ESMP—Environmental and Social Management Plan
18. GMP—Gender Management Plan
19. Ha—Hectare
20. HVAC—Heating Ventilation and Air Conditioning
21. IEE—Initial Environmental Examination
22. IFC—International Finance Corporation
23. IUCN—International Union for Conservation of Nature
24. KVA—Kilo Volt Amperes
25. LED—Light Emitting Diode
26. LPD—Litres Per Day
27. NEMC – National Environmental Management Council
28. NEP—National Environmental Policy
29. NGOs—Non-Governmental Organisations
30. NOC—No Objection Certificate
31. NOx—Oxides of Nitrogen
32. ODS—Ozone Depleting Substance
33. PM—Particulate Matter

34. PPE—Personnel Protective Equipment
35. RCC—Reinforced Cement Concrete
36. ROW—Right of Way
37. RWH—Rainwater Harvesting
38. R&R—Resettlement and Rehabilitation
39. SMP—Social Management Plan
40. SO2—Sulphur Dioxide
41. TSCP—Tanzania Strategic Cities Project
42. TOR—Terms of Reference
43. USEPA—United States Environmental Protection Agency
44. UNCCD—United Nations Convention to Combat Desertification
45. UNFCCC—United Nations Framework Convention on Climate Change
46. UNEP—United Nations Environment Programme
47. USD—United States Dollar
48. WBG—World Bank Group
49. WHO—World Health Organisation
50. WWR—Wall Window Ratio
51. ZLD—Zero Liquid Discharge

FOREWORD

The Environmental Management Act (EMA), 2004 determines the modalities of environmental impact assessment for proper management and conservation of environment and the natural resources of the country. It requires certain developmental projects to be subjected to environmental impact assessment (EIA). This is in line with the Government of Tanzania's commitment and supports Tanzania's Constitution, which makes a clear link between a healthy environment and the well-being of the citizens.

EIA is not a new subject for the citizens of Tanzania; it has been more than decades since it has been practiced in the country. Keeping in view the decade of experience in the EIA process, the Vice President's Office amended the *EIA and Audit Regulations 2005 in 2018*.

The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 has re-engineered the entire environmental clearance process with an objective to balance economic growth and environmental sustainability. The EMA, 2004 mandates to prepare sector-specific manuals and guidelines, which, it is felt is important to bring clarity in granting and standardizing the EIA process. The Council, through collaboration with other sectors, has put emphasis on developing tools including guidelines that can guide experts and reviewers in the EIA certification process.

The building construction projects play an important role in Tanzania's economic development, recognizing its importance these sector-specific guidelines for Building Construction sector have been prepared. The guidelines have been made at the right time when building construction sector is growing at a rapid pace, this will ensure that the development in the sector continues to take place but in an environmentally sustainable manner, and has linkages with cross-generational equity. The Environmental Management Act, 2004 has given mandates to different entities on fulfilling EIA requirement. Therefore, the guidelines intend to assist government authorities, EIA practitioners, departments responsible for decision making and other stakeholders to design, conduct and implement EIA. It will further help deepen and build common understanding of environmental issues associated with the sector and facilitate greater stakeholder cooperation.

These guidelines also intend to expedite the review process and address the existing gaps in the current practice by bringing some of the best practices being followed in the sector, and encouraging the adoption of alternatives that can prove to be beneficial in the long run.

Finally, I would like to recognize the effort of the team from the Centre for Science and Environment (CSE), which has taken the lead in preparing these guidelines. In the same spirit, I also applaud the staff of National Environment Management Council (NEMC) and other institutions, led by NEMC's Director General, Samuel Mafwenga, for the tireless efforts in ensuring that these guidelines are completed.

Hon. Selemani S. Jafo
Minister of State
Vice President's Office–Union and Environment

ACKNOWLEDGMENT

The successful preparation of these guidelines on building construction projects would not have been possible without the full participation, commitment and hard work of various stakeholders. It is not possible to mention all of them by name, but I would like to use this opportunity to record my heartfelt appreciation for their cooperation and support.

I am particularly indebted to the team of experts from Centre for Science and Environment, New Delhi, India who prepared the document for their commendable efforts and inputs.

I would also like to express my sincere gratitude to all the line ministries, departments and agencies that were part of the consultation meetings held to discuss the modalities of these guidelines, and for providing their valuable inputs during the preparation of these guidelines. These include the Vice President's Office, Regional Administration and Local Government; the Ministry of Lands (Town Planning); Tanzania Building Agency; Contractors Registration Board; Quantity Surveyors Registration Board; National Housing Corporation; Tanzania Environmental Expert Association; City, District, Town and Municipal Offices; and few other registered individuals and firms.

I am equally thankful to all the staff of National Environment Management Council (NEMC) including Zonal Representatives who took the responsibility of coordinating with different ministries and agencies, and the efforts they have put in finalizing the guidelines. Special thanks goes to Menan Jangu, Director, Environment Research, NEMC and his team and Ms. Lilian Lukambuzi, Director Environmental and Social Impact Assessment, NEMC whose inputs were very valuable to these Guidelines.

I am confident that this will be one of the best guidelines which will help the different stakeholders working in the sector. The efforts and contribution from various agencies and institutions have made sure that the guidelines are very practical and above all implementable on ground.

These guidelines are not permanent, and could need updation and alteration based on periodic reviews. Hence, feedback and suggestions from users for improvement of the guidelines are welcome and should be directed to the National Environment Management Council (NEMC).

Ms. Mary N. Maganga
Permanent Secretary
Vice President's Office

APPLICABILITY OF THE GUIDELINES

Building construction sector in most countries require an Environmental Impact Assessment (EIA) study. This holds true for the United Republic of Tanzania as well. It is regulated ***under the Environment Management Act (EMA), 2004*** and **Environmental Impact Assessment and Audit Regulations, 2005**, which is referred to as '**Principal Regulation**' and '**Subsidiary Regulations, 2018**, referred to as '**The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018**'. Both these regulations provide detailed framework for issuing Environmental Impact Assessment (EIA) Certificate. The EMA of 2004 mandates obtaining EIA certificate prior to the commencement of development projects.

The subsidiary regulations has categorized building construction sector under 3 categories type 'A' (item number 6 and 14), type 'B1' (item number 5 and 13) and 'B2' (item number 5 and 8) of first schedule of subsidiary Regulations, 2018. These guidelines are applicable for projects as mentioned in Table 1 below.

Table 1: Applicability of the guidelines

Item number of the First Schedule of 2018 Regulations	Categorization of project	Type of projects
ITEM NO. 6. TOURISM AND RECREATIONAL DEVELOPMENT	'A' (EIA is mandatory)	(a) Construction of resort facilities or hotels along the shorelines of lakes, river, islands and Ocean; (b) Hill top resort or hotel development; and (c) Development of tourism or recreational facilities in protected and adjacent areas (national parks, marine parks, forestry reserves etc.) on islands and in surrounding waters.
ITEM NO. 14. BUILDING & CIVIL ENGINEERING INDUSTRY		(a) Industrial parks and housing estate; and (b) Developments on beach fronts.
ITEM 13. BUILDING & CIVIL ENGINEERING INDUSTRY	'B1' (Screening to decide requirement of EIA)	(a) Major urban projects (multi-storey building, motor terminals, markets etc.); (b) Construction of residential / commercial buildings, hospitals and institutions including religious complexes* and community centers *- *religious complexes refer to buildings with facilities other than worshipping use; and* (c) schools, dispensaries, health-centres(Schools with boarding facilities for >360 students).
ITEM 5. TOURISM AND RECREATIONAL DEVELOPMENT		Any other construction for tourism and recreational activities; and Major construction works for sporting purposes
ITEM 8. BUILDING & CIVIL ENGINEERING INDUSTRY	'B2' EIA Certificate Granted on the basis of an Environment and Social Management Plan(ESMP)	Schools, dispensaries, health-centres: (a) Dispensaries and health-centres; and (b) All School projects (l <360 students).
ITEM 5. TOURISM AND RECREATIONAL DEVELOPMENT		Camping activities

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018

1. INTRODUCTION

1.1 BACKGROUND

Tanzania is the second largest market for construction in Eastern Africa, following Ethiopia[1]. As per a World Bank's report, Tanzania is considered to be the third fastest urbanizing country in Africa, and 9th fastest urbanizing country in the world. About 65 million inhabitants are expected to be living in cities by 2050 in Tanzania.

Rapid urbanization in Tanzania has allowed the construction industry to grow significantly. This growth in urbanization is in line with Tanzania's Development Vision 2025, set up by the government to transform Tanzania into a middle income and semi industrialized nation by 2025. Under the vision 2025, the government is promoting both local and foreign investment in the country and has been successful in doing so. The second five year development plan which is currently under progress, outlines new interventions to enable Tanzania industrialize in a way that will transform its economy.

The construction industry includes real estate, transport infrastructure, and other civil works, including water supply[2]. The building stock including the residential, commercial and other offices and retail is expected to increase to 60 million square meter by 2025 from the present 40 million square meter. This will lead to a large tract of land being converted into housing estates, high rise commercial buildings, recreational areas, institutional and industrial facilities. It is also expected that pressure on natural resources like change in land use, impact on the ecology, hydrology and impact on socio-economic patterns may increase manifold. The stress on other resources such as demand of energy, water and other utilities is set to increase, including an exponential increase in generation of solid and liquid wastes. For a detailed information on impacts of building construction sector, ***refer Annexure 1: Potential Environmental and Social Impacts.***

In building construction sector, there have been a large variation in types of projects ranging from residential building, multi-storey building, motor terminals, markets to large townships, hence, the magnitude of environmental and social impacts varies from project to project and depends primarily on type, nature, scale and location sensitivity. For instance, magnitude of impacts of high rise building and hotel is different as compared to township and housing estate. Impacts of Industrial and housing estate are significant on land, land use and other natural resources.

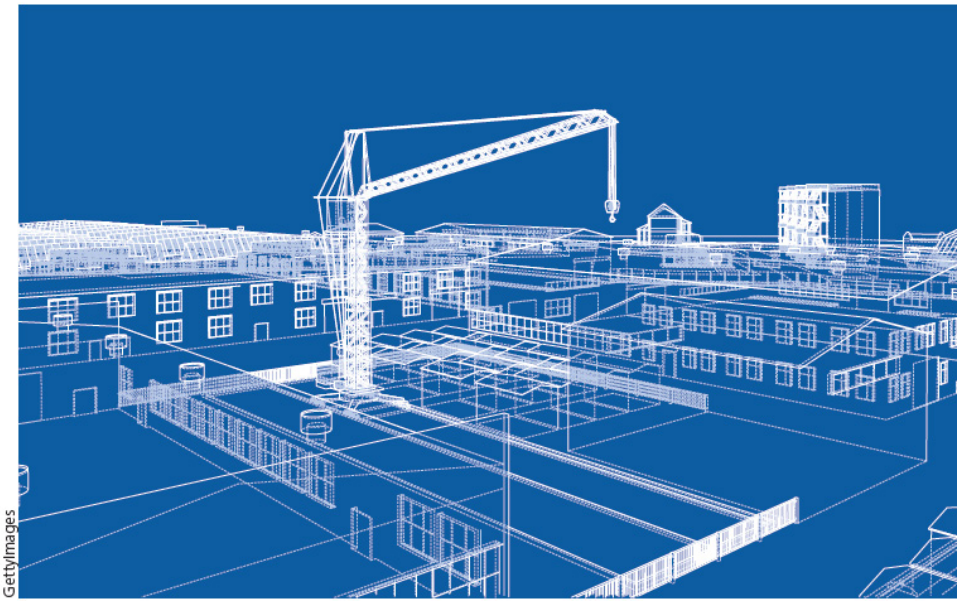
1.2 SCOPE AND LIMITATION OF THE GUIDELINES

The guidelines have been developed as sector-specific EIA guidelines for building construction sector, which is within the context of the existing Acts and Regulations and not intended to replace any existing Acts and Regulations. The guidelines will be applicable to all new projects, as specified in Table 1, to be undertaken in mainland Tanzania.

The guidelines are specific to building construction sector, and are aimed at improving the efficacy of the EIA process in the sector. These guidelines can be used by project developers, consultants, regulators, academicians and

other stakeholders for sound environmental management. The scopes of these guidelines are as follows:

1. Assist the regulatory authority and EIA practitioners in understanding the main areas of concern and employ these to enhance the quality of the EIA study and report
2. Inform the regulatory authority and EIA practitioners about the best environmental management practices related to building and construction project
3. Inform the regulatory authority, EIA practitioners and stakeholders about the Acts and Regulations applicable on building construction sector
4. Assist the authorities to assess the EIA reports in an efficient manner and arrive at a sound judgement



2. Policy and legal framework

EIA is guided by the National Environmental Policy (1997) and Environmental Management Act (EMA) 2004. The nation has a well-structured EIA process mandated under the law with a clear timeline for each step. The Minister is empowered under EMA to issue EIA Certificate for different **Types of Projects** as specified in First Schedule of Subsidiary Regulations, and make regulations and guidelines to strengthen the EIA process.

The first regulation is enacted in 2005, called Environmental Impact Assessment and Audit Regulations, 2005, also referred to as principal regulation for EIA process. The newly amended Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 provide a detailed framework for conducting EIA, categorize projects based on their impacts, provided framework for screening, appraisal process etc. The regulations aim to streamline the process of EIA time to provide clearances to projects that could fasten Tanzania's aim of industrialization.

The seriousness of environmental degradation noticed way back in the 1990s and thus six core areas were identified that need immediate attention—(a) degradation of land (b) lack of access to good quality water for both urban and rural inhabitants (c) environmental pollution (d) loss of wildlife habitats and biodiversity (e) deterioration of aquatic systems and (f) deforestation[3].

The National Environmental Policy of Tanzania of 1997 was the outcome of the concern over the deteriorating state of the environment. It laid the foundation of the endeavour to strike a balance between environment protection and economic development. The concepts of environment sustainability, environmental impact assessment (EIA), legislation and standards, resource pricing, and the precautionary principal were instruments suggested to prevent further environment degradation. Subsequently, the Environment Management Act, 2004, was enacted. The government also recognized that environmental management is multi-sectoral and multi-disciplinary, and to carry it out effectively requires the cooperation of many government agencies. Hence, sector-specific laws and regulations are enacted under leading ministries to address issues of environment management.

The National Environmental Policy (NEP) is supported by sectoral policies that provide the detailed tasks for daily environmental governance and management in the sectors. The following are sectoral policies that have environmental safeguards.

- National Forestry Policy (1998)
- National Land Policy (1995)
- National Water Policy (2002)
- Healthy Policy (1998)
- Agriculture Policy (1997)
- Mineral Policy of Tanzania (2009)
- National Human Settlement Development Policy (2002)
- National Tourism Policy(1999)
- National Transport Policy(2003)
- Wildlife Policy of Tanzania(2007)
- National Energy Policy (2003)

2.1 INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL ASSESSMENT PROCESS

The **National Environment Management Council** (NEMC) is a nodal agency for administering the EIA process; it was established under the Environmental Management Act (EMA), 2004. NEMC is headed by the Director General (DG) and operates with the assistance of directorates and regional offices to ensure effective environmental administration.

The EMA, 2004; Principal Regulations, 2005 and Subsidiary Regulations, 2018 have detailed provisions for obtaining the EIA certificate. For detailed information on Acts and Regulations, refer to Table 2:

Table 2: Key provisions in Acts and Regulations related to environmental assessment process

Environmental Management Act, 2004	Section 81	EIA study carried before issuing of any license or commencement or financing of a project.
	Section 82	Minister makes regulations and guidelines on how EIA shall be conducted.
	Section 83	• EIA conducted by experts or firms, selected by proponent, registered by NEMC. • Minister prescribes qualification of person who may conduct EIA.
	Section 86	Submission of Environment Impact statement to the council
	Section 87	Constitution of cross-sectoral technical advisory committee for EIA review.
	Section 88	For review purpose, NEMC shall visit project site for purpose of inspection or verification
	Section 89	Provisions for public participation in EIA.
	Section 90	• Review of Environmental Impact Statement (EIS) conducted through public participation. • The Council to decide within 30 days whether to convene a public hearing or not.
	Section 91	The council on the completion of the review of the Environment Impact statement shall submit recommendations to the Minister.
	Section 92	The Minister may within 30 days upon receipt of recommendation of the council, may • **Approve** the Environment Impact Statement and issue an EIA certificate • **Disapprove** the Environmental Impact Statement • **Approve** an Environment Impact statement subject to conditions, and issue an Environment Impact Assessment Certificate. On disapproval, proponent shall be notified with reasons by the minister and recommend to the licensing authority not to issue license.
	Section 93	Minister shall disapprove and recommend to the licensing authority that the project should not be licensed ,and cancelled if • Project creates adverse effect on the environment • No alternative, which can mitigate the harm done to the environment • Proponent has failed to abide to mitigation measures • Compelling social, economic, health, cultural, or religious reasons which may or are likely to cause irreversible impact on the society.
	Section 94	Minister may publish in the gazette delegate power of approval to the Director of Environment or local government authorities or sector ministries to Issue EIA certificate.
	Section 95	Person aggrieved by the decision of the minister may appeal to the Environmental Appeals Tribunal
	Section 96	The Director General of Council maintain records of decision on approvals and disapprovals of Environmental Impact Statement, which shall be accessible to the public upon payment of prescribed fee.

	Section 97	The council at any time after the issuance of EIA Certificate, requires the holder of such certificate to conduct a fresh EIA study if, • There is a change in the manner in which the project is being operated. • Project poses environmental threats which could not be reasonably foreseen at the time of the study review. • Information given in previous EIA was inaccurate, false or intended to mislead the NEMC
	Section 99	NEMC shall in consultation with relevant ministry/government agency monitor:- • All environmental criteria and phenomena with a view to make an assessment of any possible change in environment and their possible impacts • The operation of a project with a view to determine immediate or long term effects on environment.
	Section 100	On monitoring, if non-compliance is found, the holder of the EIA certificate shall:- • Take all reasonable measures to mitigate impact and report of such measure to council, or • Pay fine imposed by administrative measure by the council • Council may recommend to the Minister for revocation of an EIA certificate on persistent non-compliance, NEMC may also institute proceedings in a Court of law.
	Section 101	• Council is responsible for carrying out environment Audit, • Environment inspector determines level of conformity of activities. • Proponent is required to keep accurate records and make annual reports describing level of conformity. • Proponent shall take measures to mitigate unanticipated undesirable effects.
	Section 102	• Proponent to undertake **safe decommissioning**, site rehabilitation and ecosystem restoration before the closure of the project. • Director of Environment (DOE) shall not discharge the **Environmental Performance Bond (EPB)** until the holder fulfils the conditions stipulated.
	Section 195	Council serves a **prevention order** to make an Emergency Response Plan to reduce or eliminate the risk of an activity
	Section 196	Council serves a **protection order** to take for avoiding, remedying or mitigating the adverse effects of an activity.
	Section 197	Environmental Inspector serves an **Emergency Protection Order** to owner, manager or person in control of the premises to take any measures that will assist in reducing or eliminating the risk/harm.
	Section 198	Council on breach of any condition of a licence issued a **Compliance Order** to the licence holder requiring that person remedy the breach within a reasonable period stipulated.
	Section 228	Person violating environmental protection standards that cause damage has to compensate for the damages.
Environmental Impact Assessment and Audit Regulations, 2005	Regulation 4	No licensing authority issue a trading, commercial or development permit or license for any micro project activity that will have significant negative environmental impact before approval of an impact assessment.
	Regulation 14	An EIA is to be conducted by experts or firms registered under Environmental (Registration of Environmental Experts) Regulations, 2005.
	Regulation 15	An EIA study is to be conducted according to assessment guidelines and steps given in 4th Schedule of the regulations (steps for conducting Environmental Impact Assessment).
	Regulation 16	EIA must take into account environmental, social, economic and legal considerations by identifying impacts of the project, identifying alternatives, proposing mitigation measures and developing an EMP with mechanisms for monitoring and evaluating compliance.
	Regulation 17	Proponent shall in consultation with the Council, seek the views of persons who are likely to be affected by the project. For receiving comments on the proposal, the proponent shall publicize effects and benefits and hold public meetings. The council ensures that the comments given by the public are attached as an annexure to the EIS.
	Regulation 18	A proponent has to submit to the Council, an environmental impact statement incorporating an economic and social analysis of the project in the prescribed structure provided under the regulation.

	Regulation 19	An environmental impact statement EIS shall be made giving regard to issues stipulated in the Terms of Reference and be accompanied with a non technical executive summary in English and Kiswahili stating key findings, conclusions and recommendations of the assessment.
	Regulation 20	An environment impact statement is to be signed by each individual making the report.
	Regulation 21	A proponent is required to submit 15 original copies and an electric copy of the EIS to the council accompanied with prescribed fee.
	Regulation 22	The council may set up a cross sectoral technical advisory committee consisting of 12 specialists from different disciplines for advise on reviews of the EIA related reports.
	Regulation 23	The Council submits a copy of an EIS to relevant ministry and public institutions for review and comments to ensure that it complies with the Terms of Reference that had been developed.
	Regulation 24	Entails the review criteria to be used by the council for reviewing an environmental impact statement.
	Regulation 25	Empowers the council to conduct site visit for the purpose of review.
	Regulation 26	The council on the basis of EIS and comments received decides if a public hearing is required or not.
	Regulation 27	The public hearing is conducted at a venue accessible to the people who are likely to be affected by the project and is presided over by a person appointed by the council. The proponent gets an opportunity to respond to presentations made at the public hearing. The views presented are compiled and submitted to the Director General of the council within 14 days of the completion of the public hearing.
	Regulation 28	Public hearings will be conducted in an informal manner that permits a fair and full examination of information presented.
	Regulation 29	Any person can attend a public hearing and make presentations, except for those disallowed by the presiding officer.
	Regulation 30	On completion of the review, the council submits a review report to the Minister.
	Regulation 33	The minister decides regarding grant of an EIA certificate by either, (a) Approving an EIS (b) Disapproving an EIS (c) Approve an EIS, with conditions.
	Regulation 34	After approving an EIS, the minister issues an EIA certificate.
	Regulation 36	Provides for **transfer** of an EIA certificate on payment of prescribed fee.
	Regulation 38	The minister on advise of the council may suspend or revoke or cancel an EIA certificate where, (a) The holder contravenes the conditions of a certificate. (b) There is change in manner of the implementation of project. (c) Project poses unforeseeable environmental threat. (d) Information given by proponent is false, incorrect and misleading
	Regulation 39	All documents submitted to the council under the regulation are **public documents**.
	Regulation 40	A proponent may specify to the council what are the information he would want to be kept **confidential** and excluded from public access on the basis of commercial confidentiality or national security.
	Regulation 41	When an EIA certificate has been issued but no development has started within 3 years, the proponent shall reregister with the Council for intention to develop.
	Regulation 49,50,56	**Provisions for different audits** **Control Audit—it is conducted once in five years** by the Council whenever it deems necessary for checking compliance with the environmental parameters. **Self-Audit—**conducted annually by project proponent or hired consultant to ensure the implementation of the environmental management plan **Audit Petition—**this type of audit triggered when there is complaint or petition filed by aggrieved person with NEMC.
	Regulation 59	Projects with trans-boundary impact require appropriate measures to mitigate any adverse impacts.

The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018	Regulation 4(4), (5)	• EIA Certificate will be issued upon **proof of land ownership** and proper location of proposed project. • Minister may grant a **provisional environmental clearance** in case of Category A projects.
	Regulation 4A	Based on the magnitude of impacts on the environment, projects have been categorized under category A, B1, B2 and Special Category Projects.
	Regulation 6,7	Detailed procedure and administrative timeline for issuing EIA certificate for category B2 projects.
	Regulation 8,9	Detailed procedure and administrative time line for issuing EIA certificate for category B1 projects.
	Regulation 10	Detailed procedure for issuing EIA certificate for category A projects.
	Regulation 11	The Council prepares sector specific terms of reference to guide the proponent in development of ToRs to conduct EIA study.
	Regulation 13	The council can advise the minister for issuing a non-renewable, non-transferable provisional environmental with a validity of 4 months for Category A projects.
	Regulation 34A	NEMC can provide **duplicate certificate** if the developer has lost or destroyed his certificate.
	Regulation 41A	Validity for documents to be used for the EIA process is 2 years
The Environmental (Registration of Environmental Experts) Regulations, 2005	Regulation 14	Makes it necessary for registration to carry out or conduct any activity relating to Environmental Impact Assessment Study.
	Regulation 17	Qualification for registration as an environmental expert.
	Regulation 21	Temporary registration of a foreign environmental expert.
	Regulation 29	Certificate of registration is renewed annually.
	Regulation 32	Every environmental expert is subject to the code of practice and professional ethics.

Source: Compiled from existing Acts and Regulations of mainland Tanzania.

2.2 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The Environmental Management Act, 2004 gives NEMC the mandate to accept applications for environmental clearance, review environmental impact statement(s), recommend projects to the minister for issuance of Environmental Impact Assessment Certificate(s) and undertake monitoring to check compliance with the Environmental Management Plan

The Subsidiary Regulation, categorized development projects into four Categories—type 'A', type 'B1' type 'B2' and Special Category.

The projects which fall in type 'A', require a mandatory EIA and such a 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 identify appropriate mitigation measures.

The projects which fall in type 'B1' require to undergo screening, to decide the requirement of EIA. The projects categorized under 'B2' are small scale projects where no EIA is required, an EIA certificate is issued upon submission of an Environmental and Social Management Plan (ESMP) See Table 3: *Project categorization.*

Table 3: Project categorization

Project Category	Requirement
A	EIA mandatory
B1	Borderline projects; Screening required to decide whether EIA is required or not
B2	No EIA required; Environmental and Social Management Plan (ESMP) required
Special Category	To be treated as A category; detailed specialized study is required before EIA is conducted

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018.

As given in First Schedule of the 2018 amendment, depending on type, scale and location sensitivity, the building construction projects are categorized under three different categories as mentioned in Table 1.

WHO CONDUCTS EIA STUDY AND APPEAL?

According to EMA, 2004 only firms and individual experts certified and registered under regulation 14 of the **Environmental (Registration of Environmental Experts) Regulations, 2005** can prepare the report pertaining to which the EIA certificate is issued.

Under Section 95 of EMA, 2004 any person who is aggrieved by the decision of the Minister to approve or disapprove an Environmental Impact Statement may appeal to the Environmental Appeals Tribunal.

EXPERTISE OF EIA PROFESSIONAL

A multi-disciplinary team of qualified and experienced professionals may conduct the EIA for building construction project. Based upon the nature, location, scale, socio-economic setting, etc. the team of a composition of experts may include, but is not limited to, the following:

- Civil, building/ construction engineering (including civil engineering and Architecture); land scale
- Land and/ or Surveying, Building Economics; Urban and Regional Planning;
- Natural resources management; Environmental science; Environmental engineering; Meteorology
- Public health and sanitation or water supply and sanitation engineering;
- Socio-economic experts (sociology, law enforcement and demography)
- Wastes management and building energy efficiency professionals
- Ecologist and biodiversity expert, if applicable
- Archaeologist and meteorologist, if applicable

The EMA, 2004 also gives powers to the minister to make regulations and guidelines to strengthen the EIA framework. The Minister may delegate power to issue EIA certificates to the Director of Environment or local government authorities or sector ministries. Moreover, the Act empowers the Minister who, in consultation with local government authorities can prescribe:

1. Standards
2. Impose restrictions
3. Prevent and control pollution through practices and best methods
4. Rules on Solid Waste Management generated by various categories of Industries

For more detail information of different standards refer to *Annexure 3: National Standards applicable for Building Construction Project.*

2.3 VALIDITY

2.3.1 VALIDITY PERIOD FOR PENDING EIA PROCESS

The validity of any document submitted to NEMC for the EIA application is **2 years**, after which NEMC shall deregister the application.

2.3.2 VALIDITY PERIOD FOR EIA CERTIFICATE ISSUED

If a proponent has been issued an EIA certificate and does not conduct any development activities in relation to his project, his certificate will expire after **3 years**.

2.4 MONITORING & COMPLIANCE

For compliance with the environmental management plans and conditions of the EIA Certificate, the Environment Impact Assessment and Audit Regulations, 2005 under Regulation 46 (1) mandates audits to be undertaken on building construction projects. See Table 4:

TABLE 4: TYPES OF AUDITS

Type of Audit	Frequency	Authority or person concerned
Control Audit	Five Years	Conducted by NEMC
Self Audit	One Year	Conducted by project proponent or hired registered experts
Audit Petition	On filing of the complaint by an aggrieved person	Complaint or petition filed by aggrieved person with the NEMC for conducting an audit of the project for causing harm.

Source:- The Environmental Impact Assessment and Audit Regulations, 2005

2.5 DECOMMISIONING OF A PROJECT

The Environmental Management Act mandates the safe decommission and site rehabilitation and that has to be done by the proponent before its closure. As per Section 227 of the EMA, the proponent is required to submit an **Environment Performance Bond** to the Director of Environment as a security for good environmental practice. The bond is returned to the depositor if council observed all conditions imposed by the minister are complied. The bond can be confiscated if the proponent violates the provisions of the Act and utilized to rehabilitate the degraded environment.

2.6 OTHER ACTS AND INTERNATIONAL CONVENTIONS RELEVANT TO THE BUILDING CONSTRUCTION SECTOR

The Government of Tanzania is also a signatory to various international conventions and their compliance is abiding in sectoral and cross-sectoral development projects. Some of the international conventions, which the government is signatory to, are (a) convention on Biological Diversity (CBD) (b) United Nations Convention to Combat Desertification (UNCCD) (c) United Nations Framework Convention on Climate Change (UNFCCC) (d) The Convention for the Protection, Management, and Development of Marine and Coastal Environment of Eastern African Region and Related Protocols (f) The Vienna Convention on Protection of Ozone Layer and Montreal Protocol.

In addition, the EMA is complemented by numerous other acts that are applicable to the building construction sector. Table 5 below provides a brief overview of other Acts and Regulations, which maybe applicable. It is to be noted that lists are not exhaustive. An attempt has been made to collate various provisions of multiple acts and regulation with respect to building construction.

Table 5: LAND RELATED LAWS—Relevant to Building Construction Sector

The Land Act (4 of 1999)	Section 3	Regulates the amount of land that any one person/corporate body may occupy or use
	Section 4	Classification of Public land into: (a) General (b) Reserve (c) Village
	Section 35	Occupier of land may apply for change in the conditions of occupancy
The Village Land Act, 1999	Section 3	Regulates the amount of land that any one person/corporate body may occupy or use
	Section 4	President empowered to transfer village land to general/ reserved land for public interest
	Section 12(2)	Village Council empowered to issue certificate of customary right of occupancy
	Section 27	Length of the customary Right of Occupancy not to exceed 99 years
	Section 30	Non-resident can do agricultural, mining, tourist or other development for benefit of the villager
The Land Acquisition Act,1967	Section 3	The President may conduct compulsory acquisition of agricultural land for public purposes, for industrial, agricultural or commercial development, social services or housing
	Section 11	President can either pay money or give public land to person entitled to compensation

	Section 34	Minister may declare an urban/ peri-urban area as redevelopment area for improving standards of housing
The Land Registration Act	Section 10	Person shall apply for registration of title of an estate, with documents of possession and control of estate
The Land Use Planning Act, 2007	Section 4	Facilitates the efficient and orderly management of land use, promotes sustainable land use practices and prevents land use conflicts
	Section 28	Land use plans prepared by relevant planning authorities to include:- a) Designation of areas for small scale industries producing low cost building materials b) Establishment of new or re organization of existing settlements and physical infrastructure
	Section 23	Planning Authorities collaborate with NEMC, to determine criteria for protection of the environment and sustainable use of natural resources
	Section 51	Enforcement order served where activities conducted in a manner contrary to urban plan
The Urban Planning Act, 2007	Objective of the Act	Orderly and sustainable development of land in urban areas to preserve and improve amenities
	Section 3	Improvement in infrastructure and social services for sustainable human settlements development
	Section 29	Person shall develop land within a planning area with planning consent granted by planning authority
	Section 64	Landholder can file claims for compensation for land acquired or injury of any right
	Section 71	Claimant is entitled to recover compensation from the planning authority
The Urban Planning and Space Standards Regulations, 2018	Regulation 2	Standards for space and planning for residential areas, building lines, health facilities, education facilities, recreational facilities, golf courses, public facilities, service trade and Industries, etc. See Annexure 3.
Tanzania Investment Act, 1997	Section 17	Certificate of incentives and protection required before any form of investment.
	Section 19	Business enterprise granted a certificate is entitled to financial benefits.
	Section 20	Minister can promote identified strategic/ major investments.
Special Economic Zones Act, 2006 **Read with** **Economic Zones Laws (Miscellaneous Amendments) Act, 2011**	Section 4	Establishes Special Economic Zones to promote economic activities for faster economic growth giving priority to areas with maximum propensity to accelerate domestic production, exports promotion and employment generation.
	Section 7	Special Economic Zones include:- • Industrial Park • Export processing zones • Free trade zones • Free ports • Tourist parks • Science and technology parks • Any other prescribed areas

	Section 14(2)	Special Economic Zone Authority (SEZA) for initiation, development and management of operations can: • Acquire land for erecting buildings to be put out on lease • Provide basic infrastructure for purpose of operations • Provide within SEZ a system of sewerage, drainage and removal of refuse • Provide commercial information for benefit of investor • Ensure provision of security and surveillance • Maintenance of property and equipment
	Section 20	A person who wishes to conduct an activity or business in a SEZ must acquire a licence from SEZA
	Section 21	Companies intending to conduct non-core business within SEZ must apply for licence to conduct such an activity
	Section 22	The administration, management and coordination of the SEZ is discharged by the Director General of the SEZA, which can be further sub contracted to a zone management company.
	Section 32	Existing labour and occupational health and immigration laws will apply in SEZ
	Section 33	Existing environmental laws will apply in SEZ
The Export Processing Zones Act, 2002 **Read with** **Export Processing Zones (Amendment) Act, 2006** **Economic Zones Laws (Miscellaneous Amendments) Act, 2011**	Section 5	Prohibits conducting business, undertaking retail trade, use and transport of goods manufactured within an EPZ without a licence.
	Section 6	Export Processing Zones Authority (EPZA) issues licence to a person that intends to carry on business or activity in an EPZ
	Section 13(2)	Export Processing Zones Authority (EPZA) for initiation, development and management of operations can: • Acquire land for erecting buildings to be put out on lease • Provide basic infrastructure for purpose of operations • Provide within EPZ a system of sewerage, drainage and removal of refuse • Provide commercial information for benefit of investor • Ensure provision of security and surveillance • Maintenance of property and equipment
	Section 25	Provisions of Tanzania Investment Act, 1997 will not apply in Export Processing Zones
	Section 28	Existing labour laws will apply in Export Processing Zones

Source: Compiled from different Acts and Regulations currently in force in mainland Tanzania Note:- These are subject to change as per the amendments from time to time.

Table 6: SITE SPECIFIC LAWS—Relevant to Building Construction Sector

Forest Act,2002	Section 18	No development without EIA certificate to the satisfaction of the Director of Forestry.
	Section 20	Application for concession of forest land submitted to the Minister.
	Section 20(10)	Conditions to a concession of forest land include afforestation and reforestation
	Section 49	Obligatory requirement of permit for activities in national or local authority forest reserve.
Tourism Act, 2008	Section 8	Obligation to be registered with Director of Tourism to conduct tourism facility.
The Wildlife Conservation Act, 2013	Section 22	Establishing Wildlife Management Areas for purposes of improving community based wildlife conservation in areas

3.2.1 REGISTRATION AND SUBMISSION

Any project that intends to obtain an EIA certificate for Type B1 projects shall make an application as given in the Third Schedule of the 2018 Regulations. The application should include the following:

a. The application form
b. The prescribed fee and any other relevant information

TABLE 10: PROCESS FOR ISSUANCE OF EIA CERTIFICATE FOR B1 PROJECTS

<table>
<tr><td>Step 1</td><td>Application for Type B1 projects is to be made to the council with followings details
(a) Scoping report, See Table
(b) Terms of Reference
(c) Prescribed fees
(d) Proof that scoping report has been submitted to relevant authority for comments
Thereafter council register the project</td><td rowspan="4">Application must include the following:
a. Nature of the project
b. Proof of land ownership, (location of the project and the physical area that maybe affected by project's activities)
c. Activities undertaken during the project construction, operation and decommissioning phases
d. Design of the project
e. Site layout plan
f. Materials to be used and source, products and by products, including waste to be generated by the project and the methods of their management
g. Potential environmental impacts of project and mitigation measures to be taken during and after implementation of the project
h. Action plan ensuring health and safety of workers and neighbouring / communities during the project
i. Declaration (proposed project not within/ near sensitive ecosystem)
j. Environmental and Social Management Plan (ESMP) and Monitoring Plan;
k. Economic and socio-cultural impacts to local community / nation
l. Project budget
m. Method of Scoping Exercise
n. Identification of issues and problem
o. Synthesis of results of scoping exercise including details of potential negative and positive impacts
p. Identify stakeholder groups and how they were involved in the scoping exercise
q. Spatial, temporal and institutional boundaries of the project
r. Project alternatives and
s. Relevant information</td></tr>
<tr><td rowspan="2">Step 2</td><td>Relevant Authority will submit comments to council within 7 days from receipt of scoping report</td></tr>
<tr><td>Screening—Based on the scoping report, council will screen the project to decide the requirement of Environment Impact Assessment as specified in Second Schedule of the 2018 Subsidiary Legislation</td></tr>
<tr><td>Step 3</td><td>NEMC within 14 days from date of receiving application scrutinize Scoping report and ToRs,
-Thereafter may approve or disapprove the ToR and communicate its decision to the proponent, if ToRs disapproved, council give reasons for disapproval and asked for resubmission</td></tr>
<tr><td>Step 4</td><td>Council within 21 days from the date of receipt of the scoping report takes following two decision
(a) After review, if council is not satisfied and finds that the project causes significant negative impact and disclosed mitigation measures not sufficient, thereafter, ask proponent to undertake Environment Impact Assessment. Such project treated as A category and will have to conduct EIA as per the regulations
(b) If council is satisfied that the project does not cause significant negative impact and disclosed sufficient mitigation measures. The council may recommend to minister for ECC. Thereafter, within 14 days, minister issue ECC
(c) For verification, council may visit project site at the proponent's cost</td></tr>
</table>

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018.

Note: Total administrative time for getting environmental clearance is 35 Days

The Fisheries Act, 2003	Section 30	Prohibits conducting aquaculture, without undertaking EIA.
	Section 60	Obligation to make an application to the Director of Fisheries before constructing an establishment.
The Graves removal Act , 1969	Objective	An Act to provide for the Removal of Graves from land required for public purposes.
	Section 9	Provisions for compensation on removal of graves, by the claimant on behalf of person whose grave is being removed.

Source: Compiled from different Acts and Regulations currently in force in mainland Tanzania Note:- These are subject to change as per the amendments from time to time.

Table 7: PRE-CONSTRUCTION PHASE—Relevant to Building Construction Sector

Water Resources Management Act,2009	Section 8	Director of Water Resources for major water project conducts Strategic Environmental Assessment according to EMA,2004
	Section 9	Person /Organization either the public/private sector shall carry out an EIA for any proposed development in water resource or watershed areas
	Section 12	The occupier of land to construct works for rainwater harvesting and recycling for domestic purposes without a Water Use Permit
	Section 43	Water Use Permit necessary for diverting, damming, storing, abstracting or using water from surface or underground water source.(Issued by Basin Water Board)
	Section 51	Unregistered use of more than five years other than domestic purposes to be registered with the Basin Water Board
	Section 54	Groundwater Permit for constructing, sinking, enlarging, or deepening a well or borehole in a Groundwater Controlled Area
	Section 60	Prohibits wastage of groundwater from any borehole except for the purpose of testing the quantity or quality of the supply or cleaning, sterilizing, examining or repairing the borehole or where groundwater interferes with the execution or operation of any underground works
	Section 63	Discharge Permit mandatory for discharging effluents from any commercial, industrial or agricultural source or from any sewerage works or trade waste systems or from any other source into surface water or underground strata
	Section 34	Prohibits human activities within sixty metres from a water dam/reservoir/water source
	Section 37	Minister for the protection of water sources from pollution, erosion or any other adverse effects establish a Protected Zone.
The Water Resource Management (Water Abstraction, Use and Discharge) Regulations, 2010	Regulation 4	The basin water officer seeks information regarding Discharge certificate: • From NEMC regarding fulfillment of EIA and Environmental Auditing Report • From New Developer, regarding process specifications, including raw material, process chemicals, products and solid waste generation and disposal mechanism • Other licenses or permits such as (water use permit, building licence, Industrial licence, business trade licence) • Discharge limits and time limits for compliance
	Regulation 10	A deadline not exceeding 3 months is given for a permit to sink, enlarge, or deepen a well or borehole

	Regulation 20	Abstraction of water is lawful without permit, when • any person with lawful access to any water course abstracts for domestic purpose, provided no construction has taken place • the legal occupier of land, where there is shallow hand dug well, not exceeding depth of 15 metres • the legal occupier and owner of land, constructs water works for rain water harvesting and recycling for domestic purposes, not exceeding 20,000 litres
Engineers Registration Act, 1997 **Read with** **Engineers Registration (Amendment) Act, 2007**	Section 10	Qualification for registration as an engineer.
	Section 11	Temporary registration to an engineer not ordinary resident of Tanzania.
	Section 12A	In addition to registration process, an engineer is required to possess a certificate of practice with a validity period of 3 years.
Contractors Registration Act, 1997	Section 7	Obligatory registration with Contractors Registration Board.
	Section 10	Qualification of Contractor.
	Section 11	Temporary registration to a person/ firm not a citizen/ registered in Tanzania.
Architects and Quantity Surveyors Registration Act, 2010	Section 12	Qualification of architect, quantity surveyor or as an architectural or quantity surveying firm.
	Section 13	The board can grant a temporary registration to a person or firm not a citizen or registered in Tanzania for a specific work or assignment only.
	Section 20	Mandates developer to undertake design of building or construction works through registered person or firm.
	Section 24	Board can delete the name of a person or firm from the registers on a) Failure to report change in address b) Failure to pay annual subscription c) Failure to meet current registration criteria d) Failure to practice and discharge duties responsibly Being found guilty of misconduct
Local Government Acts 2002 (District Authorities) Cap.287 R.E.2002 and (Urban Authorities) Cap.288 R.E 2002		District and Urban councils are empowered to manage natural resources and land in their respective jurisdictions. The administrative aspects of valuation and payment of compensation are assigned to local government authorities and regional administrations
The Mining Act, 2010		A permit is required under this Act when extraction of quarry material or sand needs to be carried out.
The Explosives Act, 1963, if applicable	Section 7, 8, 9	Act mandates to apply for a permit to the commissioner of mines for the possession and use of Explosives.
	Section 25, 39	The Act mandates for an application for permission from the inspector- a) Permit for storage-for making a building, structure or excavation as an explosive store permission. b) Blasting certificate-for every activity requiring blasting.

The Standards Act, 2009		For standardization of specifications of commodities and services, to re-establish the Tanzania Bureau of Standards
The Employment and Labour Relation Act, 2004	Section 5	Prohibits child labour • Child below 14 years not to be employed • Child of 14 years may be employed to do light work • Child under 18 years not to be employed in a mine, factory or as crew on a ship or in any other worksite including non-formal settings and agriculture
	Section 6	Prohibits forced labour
	Section 7	Promotes equal opportunity in employment and eliminates discrimination
	Section 19	Maximum number of ordinary days or hours for an employee (a) 6 days in any week; (b) 45 hours in any week; and (c) 9 hours in any day
	Section 33	Female workers are entitled to get at twelve weeks (84 days) of full paid maternity leave or 100 consecutive days (in case of multiple births) within a leave cycle of 36 months
The Occupational Health and Safety Act, 2003	Section 11	Mandatory for employer with more than 20 employees at factory/workplace to designate health/ safety representatives
	Section 24	Employer has to conduct pre-placement and periodic occupational medical examination for fitness
	Section 26	Every dangerous part of all machinery has to be securely fenced safely by position or construction
	Section 29	Employer ensures fencing/safety guard of substantial construction to be properly maintained
	Section 54	Employer ensures adequate supply of clean safe drinking water accessible to employees
	Section 55	Employer provides for sanitary conveniences and separate accommodation for workers
	Section 56	Employer provides adequate and suitable facilities for washing
	Section 57	Employer provides separate clothing facilities for persons of each sex
	Section 58	Employer provides and maintains first aid box/cupboard
	Section 59	Employer provides suitable seats to enable workers for use in the rest period
	Section 60	Employer ensures annual submission of Risk Assessment Report
	Section 95	Employer ensures the health, safety and welfare of his employees and rehabilitation of affected employees
Workers Compensation Act, 2008	Section 19	Employee affected by accident resulting in disablement or death entitled to compensation
	Section 69	Employee suffering from occupational disease or accident gets rehabilitation benefits to restore health
The HIV and AIDS (Prevention and Control) Act, 2008	Section 6	Every ministry, department, agency, local government authority, parastatal organization, institution whether public or private, shall design and implement gender and disability responsive HIV and AIDS plans in its respective area and such plans shall be mainstreamed and implemented within the activities of such sector
The Fire and Rescue Force Act, 2007	Section 6	The fire and rescue force makes arrangements for giving advice on: • How to prevent fires and restrict their spread in buildings and other property; • The means of escape from buildings and other property in case of fire

Public Health Act, 2009	Section 37	Prohibits the discharge of pollutants into a water body.
	Section 53	Enlists all activities which are to be considered as a nuisance.
	Section 54	Prohibits causing of any nuisance, which can be injurious to health existing on land, water and air.
	Section 56	An authorized officer may enter a building for examining a nuisance.
	Section 57	The authority can serve a notice to a defaulter causing nuisance for preventing or reducing such nuisance.
	Section 59	The authority is empowered to issue a closure order, prohibiting the use of the building, where a nuisance renders a building unfit for human habitation.
	Section 63	Prohibits overcrowding in a building or premises.
	Section 64	The authority is empowered to auction a property which has been removed in order to reduce nuisance.
	Section 65	The authority can pass a demolition order for a building with a weak structure where the nuisance prevalent is beyond repairs. The owner of such a building will not be entitled to compensation for the demolition.
	Section 66	Prohibits occupancy in a building until plans and specifications have been scrutinized by the authority for compliance with public health requirements and a certificate of occupancy has been granted.
	Section 67	Enlists reasons for disapproval of a plan submitted to the authority.
	Section 69	The authority prohibits the use of a building or premises which in its opinion is unfit for human habitation. The authority may order such an inhabitable building or a part of it to be demolished or removed. The authority may enter a building for conducting repairs, alterations and demolition and recover costs from the owner.
	Section 71	If the authority is of the opinion that buildings within an area are unfit for human habitation, it shall implement a scheme for clearance of an area and re-housing of inhabitants.
	Section 168	An authorized officer under the authority shall ensure welfare and health of workers.
Environmental Management (Air Quality Standards) Regulations, 2007		The regulations prescribe • Criteria and procedure for measurement for air quality; • Establish ambient air quality standards; • Establish emission standard for various sources of air pollution; • Obligations for every person to comply with the minimum air quality standards
Environmental Management (Water Quality Standards) Regulations, 2007		National Environmental Standards Committee shall • Prescribe classifications, criteria and procedure for measuring standards for water quality • Establish the minimum quality standards for all waters of Tanzania; • Establish minimum standards for the treatment of effluent before their final discharge into public sewer systems; • Prescribe requirements for any effluent treatment plant • Establish minimum quality standards for different uses of water

The Environmental Management Regulations, 2009 (Solid Waste Management); (Hazardous Waste Control and Management)		To provide for proper disposal of waste and good management
Environmental Management (Standards for the Control of Noise and Vibrations Pollution) Regulations, 2015		The Regulation prescribes • • Standards for Control of Noise and Vibration Pollution • Permissible Noise levels • Obligation of every owner of machinery and premises to comply with permissible limits • Mapping of Noise and Vibration
Water Supply and Sanitation Act, 2009	Section 14	A water authority can operate only after getting an authorization by the Energy and Water Utilities Regulatory Authority (EWURA).
	Section 20	Water authority is responsible for securing a continuous supply of water by continuously treating and monitoring its quality.
	Section 21	Water authority is empowered to install water meters for the purpose of measuring quantity of water supplied.
The Electricity Act, 2008	Section 8	Obligation to obtain a licence for electrical installations in a building by the electricity authority.
The Energy and Water Utilities Regulatory Authority Act, 2011		Energy and Water Resources Authority licenses, review's tariff, monitor performance and standards with regards to quality, safety, health and environment.

Source: Compiled from different Acts and Regulations currently in force in mainland Tanzania

Note:- These are subject to change as per the amendments from time to time.

3. Issuance of EIA Certificate

3.1 ISSUANCE OF EIA CERTIFICATE FOR TYPE B2 CATEGORY PROJECTS

The issuance of EIA certificate for B2 Category projects as listed in first schedule of the Subsidiary Regulation **(Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018**) is summarized in Table 8 and Figure 1: Flow diagram for issuance of EIA certificate for Type B2 Projects.

3.1.1 REGISTRATION AND SUBMISSION

Any project that intends to obtain an EIA certificate for Type B2 projects shall make an application as given in the Third Schedule of the Subsidiary Regulations, 2018. The application should include the following:

a. The application form
b. The prescribed fee and
c. Any other relevant information

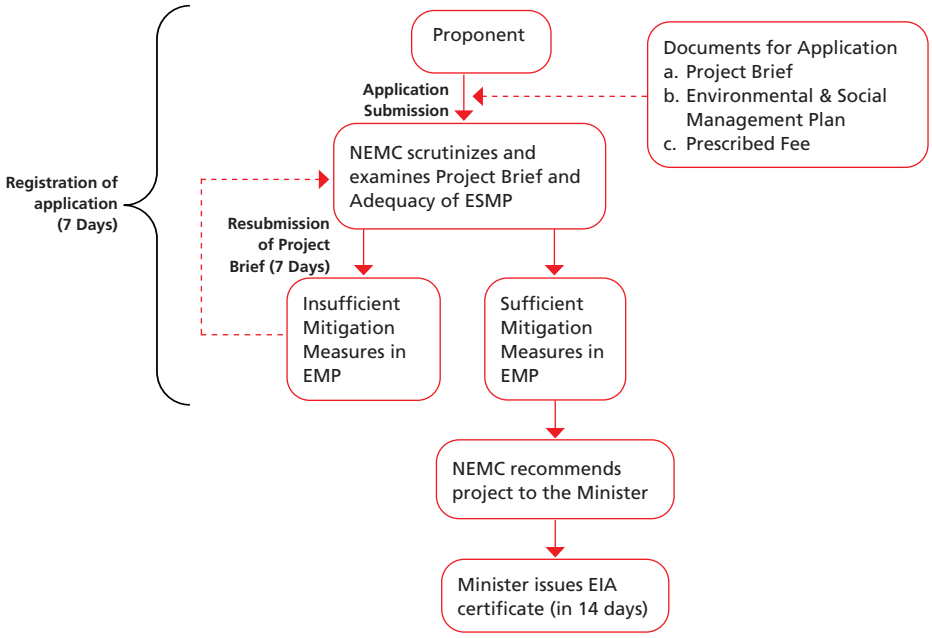
TABLE 8: PROCESS FOR ISSUANCE OF EIA CERTIFICATE FOR B2 PROJECTS

<table>
<tr><td>Step 1.</td><td>Application for Type B2 projects is to be made to the council with followings
a) Application form
b) Prescribed Fee

Project brief See Table 6 and other relevant information</td><td rowspan="5">Application must include the following:
a. Nature of the project
b. Location of project (physical area affected by project's activities)
c. Activities undertaken during project construction, operation and decommissioning phases
d. Design and technology of the project
e. Site layout plan
f. Materials to be used and source, products and by-products, including waste to be generated by the project and the methods of their management
g. Potential environmental impacts of the project and Mitigation measures
h. Economic and socio-cultural impacts to local community/ nation
i. Emergence preparedness and response plan of the workers and neighbouring communities in project life cycle
j. Environmental and Social Management Plan (ESMP) and Monitoring Plan
k. Project budget
l. Relevant information</td></tr>
<tr><td>Step 2.</td><td>The council within 7 days from the date of receiving application
a) Examine project brief based on screening criteria
b) Examine adequacy of EMP
c) Decide whether information for issue of ECC sufficient or not
d) If information is not sufficient, within seven days, the council shall require the developer to resubmit the plan.
e) For proper verification, council may visit project site at the proponent's cost</td></tr>
<tr><td>Step 3.</td><td>If the council is satisfied, with the mitigation measures, the council may recommend to the minister to approve or otherwise communicate his decision to proponent.</td></tr>
<tr><td>Step 4.</td><td>The Minister, within 14 days, issues an Environmental Impact Assessment Certificate</td></tr>
<tr><td colspan="2">Total administrative time for getting environmental clearance is 28 Days</td></tr>
</table>

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018.

Figure 1: Flow diagram for issuance of EIA certificate for Type B2 Projects



3.1.2 STRUCTURE OF REPORTING PROJECT BRIEF

As per subsidiary regulation, the proponent shall prepare Project Brief and submit to council as per stipulated structure, which is provided in Table 9.

If the Project Brief does not contain sufficient information required under these Regulations the applicant may be required to provide further information or be notified of any defects in the application and may be required to provide additional information. The Regulation also stipulated that any fraudulent or false statement in a Project Brief will cause the Council to invoke relevant provisions of these Regulations. The proponent is required to submit three copies of the project brief and prescribed fee to the Director General, of the National Environment Management Council,

TABLE 9: STRUCTURE OF PROJECT BRIEF

PROPOSED UNDERTAKING/ DEVELOPMENT	(a) title of Proposal (general classification of undertaking); (b) description of Proposal (nature of undertaking, unit processes [flow diagram], raw materials, list of chemicals; {source, types an quantities}, storage facilities, wastes/by-products {solid, liquid and gaseous) and their management; (c) scope of Proposed Project (size of labor force and working hours, equipment and machinery, installed/production capacity, product type, area covered facility/proposal, market); (d) project cost; and (e) technology to be used.

PROPOSED SITE DESCRIPTION	(a) proof of land ownership; (b) location : Administrative Location and Latitude and Longitude; (c) attach a site layout plan and location maps; (d) current zoning ; (e) distance to nearest residential and/or other facilities; (f) adjacent land uses (existing & proposed) ; (g) a declaration that the project site is not within or near the sensitive ecosystem/areas (e.g. water bodies, protected areas, schools, public utilities and defense strategic areas); and (h) land Acquisition Process (Relocation or Compensation) attach Resettlement Action Plan.
INFRASTRUCTURE AND UTILITIES	(a) Structures (buildings and other facilities); (b) Land required; (c) Water (source, quantity; (d) Power (type, source & quantity); (e) Road; (f) Other major utilities (e.g. sewerage, etc.).
ENVIRONMENTAL IMPACTS	(a) potential environmental effects of proposed undertaking (both construction, operation and decommission phases); (b) project alternatives (site, design and/or technology);
OTHER ENVIRONMENTAL ISSUES	a) Potential significant risks and hazards associated with the proposed project (including occupational health and safety) and its Emergence Preparedness and Response Plan; and (b) state briefly relevant environmental studies already done and attach copies as appropriate.
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
MONITORING PLAN	
DECOMMISSIONING PLAN	

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018.

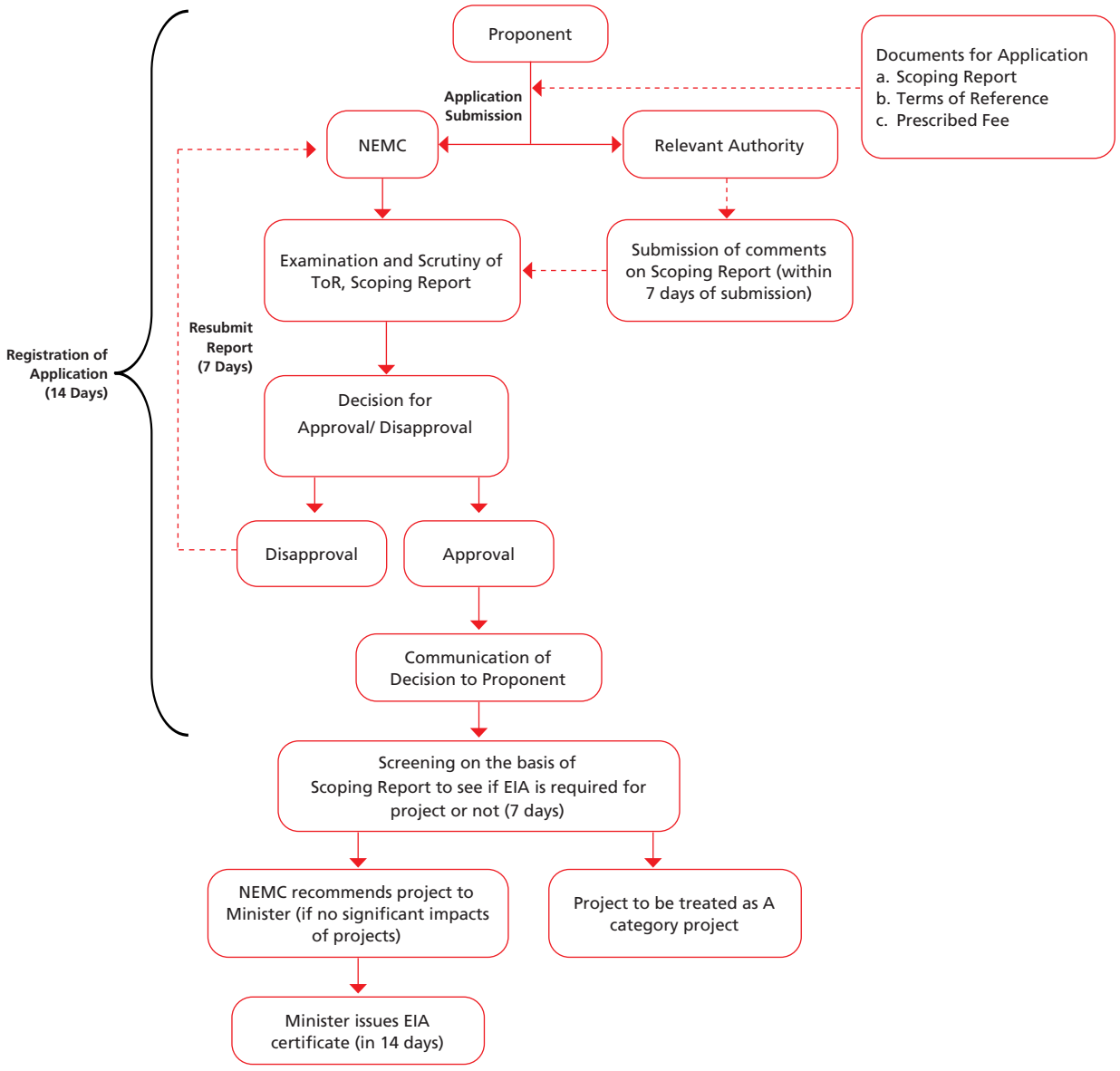
3.2 ISSUANCE OF EIA CERTIFICATE FOR B1 CATEGORY PROJECTS

The issuance of EIA certificate for B1 Category projects as listed in first schedule of the Subsidiary Regulation is summarized in Table 10 and Figure 2: *Flow diagram for issuance of EIA certificate for Type B1 Projects*.

The B1 projects includes list of medium to high impacts projects, **the process of Screening is applicable only to B1 Category of project as listed in Annexure of** first schedule of the Subsidiary Regulation. The process of Screening gets initiated as Council received (a) Scoping report (b) Terms of Reference (c) Prescribed fees (d) proof that scoping report has been submitted to relevant authority for comments

The Council undertakes the screening of the proposed project in accordance with regulation 9 to decide requirement of EIA or any guidelines that the Minister may issue for this purpose. The Project Screening Criteria as referred to in Second Schedule of Subsidiary Regulation is given in ***Annexure 5: Project Screening Criteria***. An appropriately designed screening system can prove to be an effective tool to prevent the waste of time and money while assessing projects with less environmental and social impacts.

Figure 2: Flow diagram for issuance of EIA certificate for Type B1 Projects



3.2.2 STRUCTURE OF SCOPING REPORT

As per subsidiary regulation, the proponent shall prepare Scoping Report and submit to council as per stipulated structure, which is provided in Table 11.

If the scoping report does not contain sufficient information required under these Regulations, the applicant may be required to provide further information or be notified of any defects in the application and may be required to provide additional information. The Regulation also stipulated that any fraudulent or false statement that alters the scoping report, commits an offence. The proponent is required to submit three copies of the Scoping Report and prescribed fee to the Director General, of the National Environment Management Council.

TABLE 11: STRUCTURE OF SCOPING REPORT FOR PROJECT DETAILS

PROPOSED UNDERTAKING/ DEVELOPMENT	(a) title of Proposal (general classification of undertaking); (b) description of Proposal (nature of undertaking, unit processes [flow diagram], raw materials, list of chemicals; {source, types an quantities}, storage facilities, wastes/ by-products {solid, liquid and gaseous) and their management; (c) scope of Proposed Project (size of labor force and working hours, equipment and machinery, installed/production capacity, product type, area covered facility/proposal, market); (d) project cost; and (e) technology to be used.
PROPOSED SITE DESCRIPTION	(a) proof of land ownership; (b) location : Administrative location and latitude and longitude; (c) attach a site layout plan and location maps; (d) current zoning ; (e) distance to nearest residential and/or other facilities; (f) adjacent land uses (existing & proposed) ; (g) a declaration that the project site is not within or near the sensitive ecosystem/areas (e.g. water bodies, protected areas, schools, public utilities and defense strategic areas); and (h) Land Acquisition Process (Relocation or Compensation) attach Resettlement Action Plan.
INFRASTRUCTURE AND UTILITIES	(a) Structures (buildings and other facilities); (b) Land required; (c) Water (source, quantity; (d) Power (type, source & quantity); (e) Road ; (f) Other major utilities (e.g. sewerage, etc.).
ENVIRONMENTAL IMPACTS	(a) potential environmental effects of proposed undertaking (both construction, operation and decommission phases); (b) project alternatives (site, design and/or technology);
OTHER ENVIRONMENTAL ISSUES	a) Potential significant risks and hazards associated with the proposed project (including occupational health and safety) and its Emergence Preparedness and Response Plan; and (b) state briefly relevant environmental studies already done and attach copies as appropriate.
METHODOLOGIES OF CONDUCTING THE SCOPING EXERCISE	
SYNTHESIS OF RESULTS OF THE SCOPING	
STAKEHOLDERS INVOLVEMENT	
PROJECT ALTERNATIVES	
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
MONITORING PLAN	
DECOMMISSIONING PLAN	

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018.

3.3 ISSUANCE OF EIA CERTIFICATE FOR A CATEGORY PROJECTS

The issuance of EIA certificate for Type A Category projects is listed in first schedule of the Subsidiary Regulation and is summarized in Table 12 and Figure 3: Flow diagram for issuance of EIA certificate for Type A and Special Category Projects.

3.3.1 REGISTRATION AND SUBMISSION

Any project that intends to obtain an EIA certificate for Type A and special category projects shall make an application as given in the Third Schedule of the 2018 Regulations. The application should include the following:

a. The application form
b. The prescribed fee and any other relevant information

TABLE 12: PROCESS FOR ISSUANCE OF EIA CERTIFICATE FOR TYPE A PROJECTS

<table>
<tr><td>Step 1.</td><td>Application for Type A projects is to be made to the council with following:
(a) Scoping report, See Table 9
(b) Term of Reference
(c) Prescribed fees
(d) Proof that scoping report has been submitted to relevant authority for comments

Thereafter council register the project</td><td rowspan="11">Application must include the following:
a. Nature of the project
b. Proof of land ownership, (location of the project and the physical area that maybe affected by project's activities)
c. Activities undertaken during the project construction, operation and decommissioning phases
d. Design of the project
e. Site layout plan
f. Materials to be used and source, products and byproducts, including waste to be generated by the project and the methods of their management
g. Potential environmental impacts of project and mitigation measures to be taken during and after implementation of the project
h. Action plan ensuring health and safety of workers and neighbouring/communities during the project
i. Declaration (proposed project not within/ near sensitive ecosystem)
j. Environmental and Social Management Plan (ESMP) and Monitoring Plan;
k. Economic and socio-cultural impacts to local community /nation
l. Project budget
m. Method of Scoping Exercise
n. Identification of issues and problem
o. Synthesis of results of scoping exercise including details of potential negative and positive impacts
p. Identify stakeholder groups and how they were involved in the scoping exercise
q. Spatial, temporal and institutional boundaries of the project
r. Project alternatives and
s. Relevant information</td></tr>
<tr><td rowspan="5">Step 2.</td><td>Relevant Authority will submit comments to the council within 7 days from receipt of scoping report</td></tr>
<tr><td>The Council within 14 days of receiving the Scoping report, may approve or disapprove the ToR and communicate its decision to the developer.</td></tr>
<tr><td>Where scoping report has been disapproved, the proponent is required to resubmit the report.</td></tr>
<tr><td>Minister may upon the advice of the council grant a non-renewable and non-transferable Provisional Certificate of 4 months validity to the developer of
a) Industrial project
b) agro-based processing project
c) project of strategic national or public interest , determined by minister.

Minister Issues Provisional Environmental Clearance certificate, subject to :-
(a) project is registered with NEMC,
(b) proof of land ownership from relevant authorities is attached with application,
(c) project is not within or near sensitive ecosystem areas,
(d) proof that project shall comply with appropriate land use plan has been attached,
(e) NEMC has conducted a site visit for verification of project.

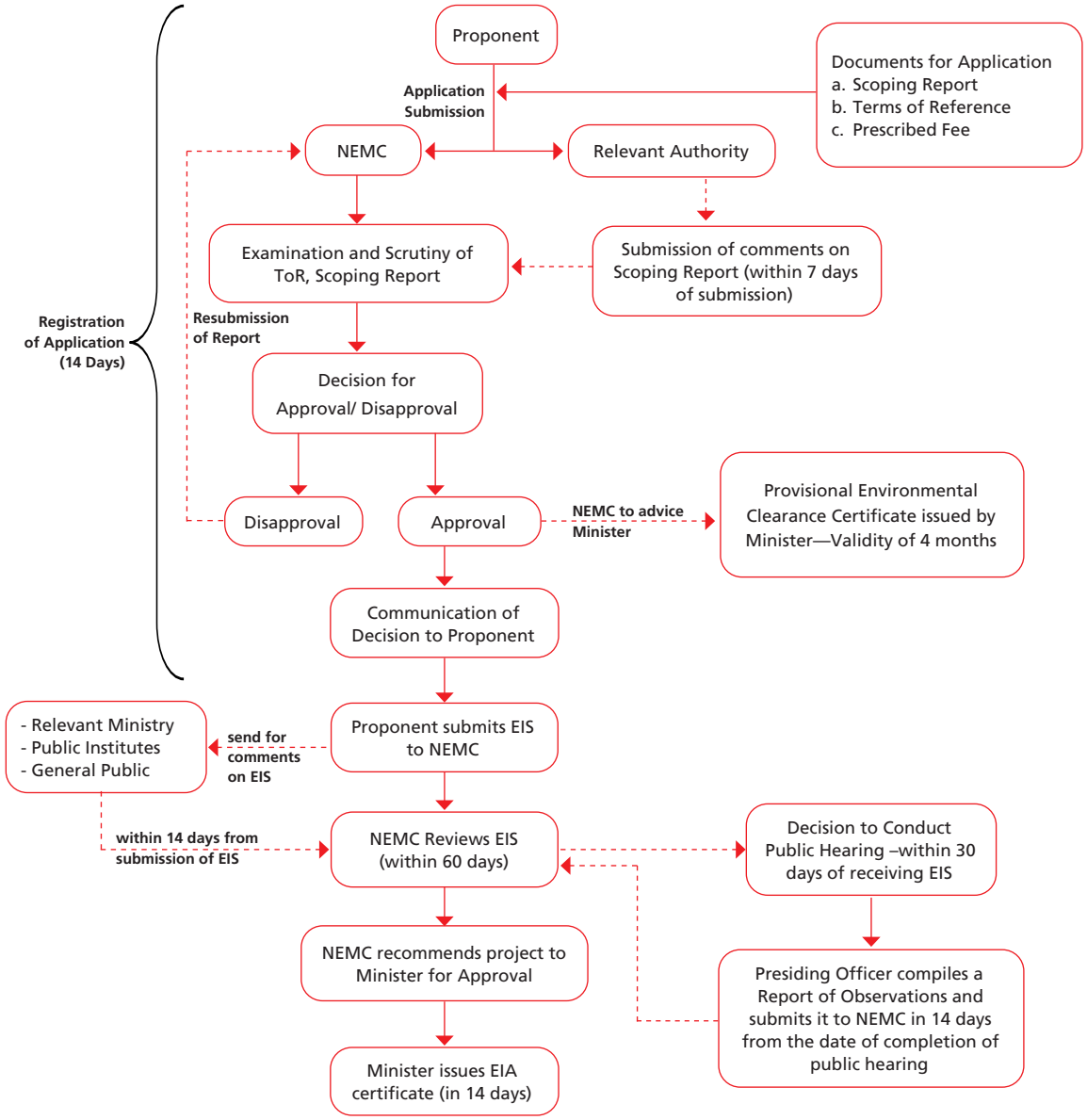
After Issuance of Provisional Environmental Clearance Certificate, proponent can mobilize:-
(a) Materials
(b) Labour
(c) Capital
(d) Production facilities, contributory items and services.
(e) Temporary storage facilities
(f) Other relevant permits

A developer is prohibited to commence any implementation before getting the EIA certificate.</td></tr>
<tr><td></td></tr>
<tr><td>Step 3.</td><td>After Approval of Scoping Report and Terms of Reference, the proponent is required to submit an Environmental Impact Statement (EIS).</td></tr>
<tr><td>Step 4.</td><td>NEMC within 14 days of receipt of EIS, submit a copy to the relevant ministry and public institution and invite general public for comments.</td></tr>
<tr><td rowspan="2">Step 5.</td><td>Relevant Ministry and Public Institutions shall review the report and communicate comments to NEMC within 14 days from the receipt of EIS or more along with reasons, the NEMC shall review the EIS of the project</td></tr>
<tr><td>NEMC may decide if it necessary to conduct public hearing for collecting comments on the EIS from the interested parties.</td></tr>
</table>

	On conclusion of the public hearing, the officer presiding over the public hearing shall compile a report of the views presented at the public hearing and submit it to the Director General within 14 days from the date of completion of public hearing.	
	According to the Act, the council has to conduct its review within 60 days following the date of submission of EIS.	
Step 6.	The Minister, within 14 days can further issue an Environmental Impact Assessment Certificate or disapprove the project and communicate his decision	
Total administrative time for getting environmental clearance is 102 Days		

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018.

Figure 3: Flow diagram for issuance of EIA certificate for Type A and Special category Projects



The 2018 Amendment mandates that if the Minister is satisfied with the recommendation of the Council (NEMC), he may issue a **4 months non-renewable Provisional Environmental Clearance Certificate** for the projects falling under A Category. Moreover, such projects are supposed to conduct an EIA study within a period of **four months** of receipt of the Provisional Environmental Clearance certificate.

The Provisional Clearance facilitates the proponent by allowing him to undertake mobilization of materials, labour, capital, production facilities and contributory items related to the project. Although the provisional certificate does not entitle the proponent to commence any project activities prior to obtaining the EIA Certificate, acquiring the Provisional Clearance does not guarantee that the proponent will get the EIA Certificate.

3.4 Roles and responsibilities of different stakeholders at various stage of EIA process

Depending upon the category of the project as A, B1 or B2, various stages of EIA are decided. The roles and responsibility of different stakeholders, and their involvement at various stages of EIA process are elaborated in Table 13 below;

Table 13: Roles and Responsibilities in EIA

Step	Action	Responsibility
1	Project Registration	Developer
2	Screening	National Environment Management Council (NEMC)
3	Scoping	Developer/Environmental experts ***Note:-** The proposed Terms of Reference (ToR) is approved by NEMC for carrying EIA study*
4	Base line study	Environmental Experts/ Developer
5	Impact Assessment	Environmental Experts/ Developer
6	Impact mitigation and assessment measures	Environmental Experts/ Developer
7	Preparation of Environmental impact statement and Environmental and social Monitoring Plan (ESMP)	Environmental Experts/ Developer
8	Review of Environmental Impact Statement	NEMC assisted by Cross Sectoral Technical Advisory Committee
9	Issue of EIA certificate	Minister
10	Environmental monitoring and Auditing	NEMC/Sector specific/Local Government Agency (LGA)/ Developer
11	Decommissioning	Developer/NEMC/Sector specific/LGAs

Source: Compiled by Centre for Science and Environment

4. Steps for conducting Environmental Impact Assessment

According to Subsidiary Regulation, EIA study is only applicable for the project, which falls in Type A and Special Category projects. The Fourth Schedule of the Subsidiary Regulation provides detailed steps for conducting EIA study for the preparation of Environmental Impact Statement (EIS) report. These are explained below.

The Principal Regulation states that an environmental impact assessment shall take into account environmental, social, cultural, economic, and legal considerations, and shall—

(a) Identify the anticipated environmental impacts of the project and the scale of the impacts;
(b) Identify and analyse alternatives to the proposed project;
(d) Propose mitigation measures to be taken during and after the implementation of the project; and
(e) Develop an environmental management plan with mechanisms for monitoring and evaluating the compliance and environmental performance, which shall include the cost of mitigation measures and the time frame of implementing the measures.

4.1 Screening

According to the Subsidiary Regulation, the projects which fall in type 'B1' are subject to screening to decide the requirement of EIA. The said regulation details out lists of screening criteria, which are applicable to type 'B1' projects and the same are provided here in ***Annexure 5: Project Screening Criteria***.

4.2 Scoping

Scoping is considered as the backbone of an EIA process, and is ideally undertaken at the project planning stage. The main objective of scoping is to establish environmental and social priorities, set the boundaries for the study and define the Terms of Reference (ToR). Systematic and well planned scoping forms the basis of an effective and efficient EIA process.

The objective of the ToR is to keep the assessment process brief and focused, and to avoid creating a voluminous or a data-deficient report. The ToR provides the benchmark for data collection and limits the possibility of inefficiency in the EIA process. There are various tools that can be used for scoping, such as questionnaires, checklists, network method, site visit, and comparison with other similar projects etc. The selection of scoping tools largely depends on the size of the project and the existing environmental and social settings of the project area.

While framing the ToR, ground realities, background information of the study area (such as population in and around the project site), project specific peculiarities, applicable laws, regulations, guidelines and policies need to be taken into account to make the ToR relevant and precise.

The fourth Schedule of Subsidiary Regulation clearly stipulates what is to be carried out during the Scoping stage of EIA process. At this stage, the developer, proponent, environmental experts or firm of experts shall undertake a scoping exercise in order to:

a. identify the main stakeholders that will be negatively or positively impacted by the proposed project;
b. identify stockholder's main concerns regarding the proposed project;
c. identify main project alternatives;
d. identify likely impacts, data requirements, tool and techniques for impact identification, prediction and evaluation;
e. identify project boundaries in terms of spatial, temporal and institutional aspects;
f. environmental experts or firm of experts shall ensure that there is adequate stakeholder participation in this and all the other stages of the Environmental Impact Assessment; and
g. the developer or the environmental experts or firm of experts shall prepare a Scoping Report and terms of reference for the Environmental Impact Assessment of a proposed project and submits to the Council for approval.

Further, it also helps the competent authority to decide whether the EIS report has been compiled after meeting all the requirements or not.

4.3 Generic ToR for Building Construction projects

The ToR given below is a generic one for building construction projects and is applicable for projects which fall under type 'A' category or when type 'B1' listed project after screening treated as type 'A' project. *Refer Table 3: Project Categorization.*

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As the given ToRs is generic, hence, depending on type, scale of a project, its location, sensitivity of site and scope of works; generic ToR should be made more project specific to suit the project requirement. There is also a possibility that some of the listed set of questions are not applicable to a specific project. Hence, a site visit is recommended before framing the ToR; this enhances the scope of the EIA process and makes it more efficient.

Generic ToRs for building construction projects should include the following details and components:

4.3.1 General information

1. A non technical executive summary of the project in English and the local/vernacular language, which summarizes the project characteristics, environmental and social issues, and the proposed mitigation measures
2. Background information about the project proponent
3. Site justification with clear description for choosing the site
4. Project investment cost, project benefits and the project activity schedule in detail
5. Composition of EIA team, qualifications and experience of experts involved in the EIA assessment and report preparation
6. List of all regulatory approvals in tabular format and other clearances or permit or licenses required for the project, wherever applicable and the status of these approvals
7. A self-declaration statement from the consultant stating that the information disclosed in the EIA report is correct

4.3.2 Essential maps

1. A map specifying the location coordinates of a project
2. A map specifying the land use patterns of the project site and study area, applicable for industrial and housing estate
3. A map marking the sensitive zones in the study area, such as parks and protected areas, defense installations, international border, historical and cultural heritage value of the site and airports (if applicable)
4. A study area map indicating features such as locations of human settlements, other neighbourhood details, if relevant
5. A contour map of the project site and the study area
6. A map indicating number of villages getting affected due to land acquisition, if applicable
7. A detailed layout plan for a project, including plan shows access road, internal access roads including all utilities
8. A map indicating the flood ability or high tide and low tide, if applicable in case project is coming along a river or coastal belt
9. A map clearly delineating the locations of various monitoring stations (ambient air, water monitoring and noise)
10. Service drawings:
    a. Master/ Site plan
    b. Parking plans
    c. Floor plans
    d. Elevations
    e. Sections

Note: *Depending upon the type, size and location sensitivity, a competent authority can decide the study area and recommend an appropriate scale for EIA for an in depth study*

4.3.3 Description of the project site and study area

A. Information on existing land use pattern of the project area:

1. Describe the total land required for the project including land use pattern of acquired land and the study area (note: study area needs to be defined by the council, it may change from project to project)
2. Description on areas vulnerable to erosion or areas prone to landslides, wherever applicable
3. If forest land or agricultural lands are likely to be diverted, then provide

the information listed in Table 14. If grazing land is used for setting up a project, information on the cattle pressure on the land needs to be provided.

4. If land acquisition is involved, the report should give the extent of land to be acquired for a project along with name of affected people village-wise with the following information:
   a. Village-wise list of the affected persons and properties
   b. The extent and nature of land and immovable property to be acquired including list of common and government properties, which are affected or likely to be affected
   c. A list of persons likely to lose their employment or livelihood or likely to be alienated wholly or substantially from their main sources of trade, business or occupation due to land acquisition, if applicable
   d. Socio-economic importance of the site e.g. recreational, any public beach, public access, any agricultural activity; fishing activity, etc
   e. Resettlement Action Plan, if applicable

5. Seismic characteristic of project area or proposed site close to volcanic area. If the site is falling in seismic zone, as per the seismic zoning map of Tanzania, the foundation design of a project must consider the seismic factor
6. Demonstrate the risk associated with the project based on geo-technical and hydrology of the project area

Table 14: Information required if forest or agricultural land is being diverted

Agricultural Land	Total Area (ha)	Types of crops grown in a year	Number of crops grown in a year	Crop productivity (TSH./ ha)
Forest Land	Total area required (ha)	Type of forest	Actual area to be diverted (ha)	Types of activities on diverted forest land

B. Information on sensitive areas at project site and in the study area, if any:

1. Distance of the project from key installations such as airports, defence installations, highways, wetlands, national parks and sanctuaries, ecologically sensitive biological corridors, archaeological sites, critical watershed areas or any other important installations
2. Discuss, if the project site or study area supports any unique habitats or any endemic, threatened or declining species or species of high economic and/ or ecological value
3. List of flora and fauna in the project area, duly authenticated by a government approved organization or by an independent body such as a university. The findings should be annexed with the report
4. Presence of nesting, breeding, foraging site for resident and transient bird species or bat or locations favoured by migratory birds either in project area or in immediate neighbourhood, if any
5. If the site preparation requires cutting trees, then provide the following information:
   a. How many trees are proposed to be cut down?
   b. Plant species and age of trees.
   c. Are they protected/endangered/endemic species? *If yes, provide details*

For more detailed information refer to Annexure 2: Biodiversity assessment.

C. In case the site is in close proximity to the coastline then the following need to be considered

1. Wherever applicable, description of the shore types (sandy, muddy, rocky, cliffs, mixed, calcareous lime stone shore), length of the shoreline, beach front and their characteristics, landform, topography, elevation, magnitude of slope, slope stability, erosion, escarpments and landslide risks supplemented by interval contour map;
2. Wherever applicable, description of the hydrographic conditions to include wave regime (patterns, height, frequency and direction), distance from project site, currents direction and speed, tidal water levels including the probability of extreme conditions and potential for waves and surges ;
3. Vulnerability of the site to natural hazard, sea surges or climate change impacts like sea level rise, inundation or flooding, if applicable.

4.3.4 Resource requirements

1. Provide a schedule for each phase of construction and operation for the entire project and ancillary facilities. Include the environmental issues associated with each ancillary activity, wherever possible:
   a. Mobilization
   b. Land clearing
   c. Construction of road
   d. Blasting, if applicable
   e. Borrow and spoil disposal
   f. Excavation and sub-grade preparation
   g. Foundation preparation
   h. Concrete work
   i. Construction and installation of each project facility
   j. Stabilization of disturbed areas
2. Details of workforce to be employed—skilled, semi-skilled and unskilled labour both during construction and operational phases of the project, with specific attention to employment potential of local population
3. Construction camps (if applicable)
   a. Location of the camp and its nature
   b. Water supply and sanitation
   c. Waste generation, handling and disposal
   d. Fuel supply
4. If applicable, provide detailed descriptions of batch plants, hot mix and rock crushers; their capacity, fuel requirement and storage including the environmental measures for pollution abatement and control;
5. Describe the expected quantity of raw materials to be used during project construction (see Table 15: *Raw material requirement), if query is proposed for stone supply or obtained from other local miners or suppliers, append the query permit;*
6. If the project requires quarries, for supply of construction materials, then, describe the number of quarries to be opened, their capacity, the location of the quarries and sensitivity of surroundings, including the restoration and reclamation plan of the quarry site

Note:-

- If the quarry is part of the project, a separate study needs to be done.
- If it is sourced from other quarry, the proponent should ensure that it has adequate licenses and permits. The proponent should make sure that the material is sourced from authorized quarry operator

7. Describe the types of equipment required for the proposed project during construction stage (as mentioned in Table 16: *Equipment type and anticipated quantity)*

8. Water balance, detailing the source, quantity and water usage during construction and operation stage

Table 15: Raw Material Requirement

List of construction materials	Quantity (tonnes/month)		Source of material	Mode of transportation and storage site
	Peak	Average		
Cement				
Stone				
Steel				
Sand				
Water				
Bitumen				
Fuel				
Others (Please Specify)				

9. Generation of any cut and fill; if yes, describe in details the quantity, potential impacts on environment and its management

Table 16: Equipment type and anticipated quantity

Construction Equipment	Equipment Type	Equipment Number

10. Detailed **building layout plans drawn to a readable scale or as appropriate,** indicating, plot coverage and building footprint;
11. Detailed architectural drawings **drawn to a readable scale or as appropriate on A3 size** in respect of all buildings/structures including elevations associated.

4.3.5 ToRs for Baseline data generation

1. Data on surface and ground water both in terms of availability and its physical, chemical and biological characteristics including inventory of natural drains, streams, springs, water crossings and other water bodies, and their distances from the project
2. List of potential activities, which can cause siltation and pollution of water resources
3. Wherever applicable, describe the quantity and quality of top soil to be generated during the construction of access roads, internal roads and other potential areas, including its utilization and conservation
4. If there is any change in the drainage pattern after the proposed activity, details of changes need to be furnished including the identification of areas vulnerable to erosion
5. Baseline data on ambient air quality should include parameters such as Particulate Matter (PM10) and PM2.5, and information on existing meteorological conditions such as temperature, humidity, rainfall, wind speed and direction, wherever applicable
6. Details about the potential sources of fugitive emissions and list of activities that may generate fugitive dust.
7. Details of the quantity and characteristic of wastewater likely to be generated including from the utilities, if applicable

8. Details of the quantity and characteristic of solid/hazardous wastes likely to be generated including from the utilities, if applicable
9. Details about the potential sources of noise generating equipment and activities that may cause noise pollution
10. Socio economic data

4.3.6 ToRs for Impact assessment

Note:- In impact assessment section, wherever possible, alternatives should be considered to reduce overall impact of the project

1. Impact due to land acquisition—Displacements and relocation of people affected by projects should ensure that the dignity, human and civil rights, livelihoods, cultures and social networks of affected people are upheld. These should be taken into consideration when conducting the EIA or formulating social and economic safeguards. To do this satisfactorily, the developer should engage or facilitate engagement of all stakeholders in prior, free and informed consultations
2. Impact due to modification, diversion and civil works on existing natural drainage or water courses flowing through or near the project area such as rivers, streams, springs and drains, if applicable.
3. Impact of project during site preparation, transportation, storage of construction materials, civil works, and allied activities such as construction of access roads, crushing, batch plant, etc. on ambient air quality including workers and nearest human settlements
4. Impact of movement of heavy vehicles and increase in traffic on local infrastructure
5. Impact of noise on the nearest human settlement, *if applicable*
6. Impacts due to slope, destabilization caused due to site preparation, civil works, construction of access roads and other activities, *if applicable*
7. *Assess the impacts of a project on receiving water bodies or on land due to discharge of surface runoff or wastewater during construction and operation stage of a project*
8. *Assess the impacts of a project due to increase in generation of solid wastes during construction and operation stage of a project*
9. Impacts on social infrastructure namely educational, recreational and health care facilities; transport; waste collection, treatment and disposal facilities; housing; water and power supply; public safety
10. Improvements in the infrastructure and economic opportunities in the area
11. Risks and hazards associated project and other allied activities including potential occupational health and safety issues that may arise out of: (a) working at a height b) structure failure (c) live power lines causing electrical hazards (c) Fire/explosions from transformers etc.
12. Decommissioning plan—the proponent should conduct a study for safe decommissioning.

4.3.7 ToRs for Environmental Management Plan (EMP)

The EMP should discuss the mitigation measures to be taken against each significant impact, the timeline for completion, departments responsible for implementation, allocated budget for the EMP, post-monitoring provisions and reporting to the concerned regulatory authority.

1. Preparation of a Resettlement and Rehabilitation plan (R&R) if displacement or loss of livelihood is involved. The plan should include details of the compensation provided, employment or money, provisions at the resettlement colony—basic amenities including housing, educational facilities, infrastructure and alternative livelihood potential; a clear timeline for implementation; responsibility; budgets; and grievance mechanisms

2. Detailed plan biodiversity conservation plan if endemic/threatened/endangered/vulnerable species are present in the project site or surrounding areas (see Box: *Definitions by International Union for Conservation of Nature*)
3. Detailed plan to reduce landslides and ensure slope stabilization during construction of access road on a hilly terrain, *wherever applicable*
4. Prepare a detailed plan for fugitive emission control during land-clearing, civil works, handling/transporting of construction material, construction of access roads, quarry operations, hot mix and batch plants, *if applicable*
5. Mitigation measures for erosion control and run-off from the area where construction is to take place, especially if there is a water body or agricultural land adjoining to the project site
6. Plan for topsoil utilization and conservation
7. Mitigation measures for water conservation (water saving devices , use of tap with sensors, rain water harvesting, irrigation management) including initiatives to reduce overall energy footprint
8. Detailed plan or measures adopted to make sustainable use of resources such as energy consumption e.g. renewable energy source (solar energy and photovoltaic cells, solar lighting), energy saving devices and mercury free energy efficient lighting (low energy bulbs, bulbs with sensors), use of eco-friendly materials (paints and coatings for buildings, ozone-friendly with an Ozone Depleting Potential value of zero and climate friendly, use of eco-friendly herbicides/pesticides, organic fertilizers, composting and Integrated Pest Control Management)
9. Describe in detail the mitigation measures for solid wastes—A waste management programme that considers best practices like prevention, reduction at source, reuse, recovery and recycling with facilities for receiving recyclable waste materials (bottles, cans, paper, plastic, organic material, etc.) as well as composting should also be included. The management plan for collection, transportation and disposal should suit the local authority.
10. A plan for wastewater treatment, recycle and reuse
11. Mitigation plan for hazardous chemicals and wastes, if applicable
12. Measures to ensure safety, health and hygiene at the work place, if applicable
13. Groundwater augmentation plan, if applicable
14. Flood management plan, if applicable
15. A healthcare plan for workers and the communities
16. Environmental and social management plan for camp workers during construction phase, including provision of canteen, rest rooms and other amenities for employees, if applicable
17. Measures to prevent health hazards and to ensure security in the working environment for the employees
18. A plan for landscaping plan, green spaces, type of plants/trees including species introduced for landscaping purposes.
19. A plan for traffic mobility and associated items such as parking and road safety, if applicable
20. Emergency preparedness, if applicable
21. Climate Change issues, if applicable—Risk based mitigation approach of the site giving details to show that the development is climate resilient, if applicable (b) Details on the engineering design of the project taking into consideration the vulnerability of the site to natural hazard, sea surges or climate change impacts like sea level rise, inundation or flooding;
22. Mitigation plan to reduce, avoid or minimize spills and leaks from DG set, transformers, substations, etc., if applicable
23. Mitigation plan for quarry related activities including its restoration, *if applicable*

24. Mitigation measures for noise abatement and control, *wherever applicable*
25. Mitigation measures against extreme weather events and natural catastrophes such as landslides, earthquakes, *wherever applicable*
26. A management plan for occupational health and safety of the workers and local community, *wherever applicable*

Definitions by International Union for Conservation of Nature

a. Endemic—Native to, and restricted to, a particular geographical region. Highly endemic species, those with very restricted natural ranges, are especially vulnerable to extinction if their natural habitat is eliminated or significantly disturbed.
b. Threatened—A threatened species is a native species that is at risk of becoming endangered in the near future.
c. Endangered—When used in the context of the IUCN Red List, a taxon is classified as 'Endangered' when there is a very high risk of extinction in the wild in the immediate future (IUCN, 2001).
d. Vulnerable—When used in the context of the IUCN Red List, a taxon is classified as 'Vulnerable' when facing a high risk of extinction in the wild in the immediate future (IUCN, 2001).

4.4 Baseline Study

Appropriate data is a pre-requisite for a correct and proper EIA study. Impact assessment depends on understanding cause-effect relationships. Baseline data on various environmental and social parameters—including air quality, water resources and water quality, biodiversity, land use patterns, demography and community dependence on natural resources—is vital for constructing these relationships and assessing the short and long-term impacts. The purpose of baseline data collection is two-fold (a) to get an idea of the existing environmental, social and economic scenarios in and around the proposed project's location; (b) to identify changes in the environmental and social parameters. Both primary and secondary data are collected to describe this status.

Hence, it is crucial that the environmental experts or firm of experts shall undertake detailed survey of the existing social, economic, physical, ecological, social-cultural and institutional environment within the project boundary area. Further, the consultant must ensure that there is adequate stakeholder participation in baseline study. For more details on types of baseline data to be collected for building construction projects, refer to section ***4.3 Generic ToRs for Building Construction Projects***.

4.5 Impact Assessment

Impacts assessment is a vital exercise for deciding alternatives, planning mitigation measures and developing an EMP. Predicting the magnitude of impacts and evaluating their significance is a cornerstone of the assessment process.

This process is also known as impact analysis and can be broadly broken down into three overlapping phases:

- *Identification*: To specify the impacts associated with each phase of the project and the activities undertaken
- *Prediction:* To forecast the nature, magnitude, extent and duration of the main impacts

- *Evaluation:* To determine the significance of residual impacts after taking into account how mitigation will reduce a predicted impact

Normally, in an impact assessment, potential impacts can be categorized into various parameters ranging from its type and nature to magnitude and reversibility, each signifying its importance in impact prediction and decision making (see Table 17: *Parameters which determine impact characteristics*)

The environmental experts or firm of experts ensure that concerns and views from stakeholders are fully taken into account during the assessment of impacts; and assesses all possible alternatives and their impacts, and recommends most appropriate options.

Table 17: Parameters which determine impact characteristics

Parameters	Description
Type	Positive or Negative
Nature	Direct, indirect or cumulative
Magnitude or Severity	Low, moderate or high
Timing	Short term, long term, intermittent or continuous
Duration	Temporary or permanent
Reversibility	Reversible or irreversible
Significance	Local, regional or global

4.5.1 Impacts identification

To ensure effective impact identification, the practitioner/reviewer should always opt for a simple, logical and systematic approach. As a good practice in EIA, it is always recommended to consider all potential impacts and their interactions. At the same time, it is important to ensure that indirect and cumulative effects which may be potentially significant are not unintentionally omitted.

All the identified impacts may not require a detailed analysis and evaluation—the level of detailing should match the scale, sensitivity and complexity of impacts. The choice of the chosen methodologies should reflect these criteria.

4.5.2 Impacts prediction

Predictions of impacts are normally based on commonly used qualitative and quantitative methods and models. Expert judgments and comparison with similar projects can also be used for impacts prediction.

There are a number of models for predicting impacts on the physical environment. Modeling socio-economic and cultural impacts is difficult and is generally done through qualitative assessment or economic analysis. A model can be effective only if the input data is correctly entered. The use of models, therefore, should be done with care and prudence.

The sophistication of the prediction methods to be used should be in proportion to the 'scope' of the EIA. All prediction techniques involve assumptions and uncertainties. While quantifying and stating an impact, these assumptions should be clearly described.

4.5.3 Impacts evaluation

In impacts evaluation, the predicted adverse impacts are analysed on the basis of their significance. Therefore, the criteria for evaluating the significance of impacts and their effects should be set in advance (see Box: *Impacts evaluation criteria*) and should be based on local standards wherever possible. Where local standards are not available, acceptable international standards should be used for instance International Finance Corporation (IFC), World Health Organization (WHO) or United States Environmental Protection Agency (USEPA), or standards and guidelines of others countries, which incorporate best practices.

Impacts evaluation criteria

- Comparison with laws, regulations or accepted national or international standards. Refer Chapter 2 on Policy, Guidelines and Legal Provisions for building and construction projects
- Consistency with international conventions or protocol (Note: Tanzania is signatory to many international conventions)
- Reference to pre-set criteria such as conservation or protected status of a site, features or species
- Consistency with local, regional and national policy with reference to
  a. Landscape value
  b. Proximity to dwellings
  c. Cultural heritage
  d. Set back distance from airport and others sensitive areas
  e. Restricted areas
  f. Others
- Comparison with best practices (energy and water usage and initiatives for conservation, waste and pollution management, traffic related air pollution and congestion, climate impacts etc.)
- Existing environmental and social stress in the area
- Extent of impacts on biodiversity or other natural resources and carrying capacity
- Whether overall potential benefits outweigh the environment and social impacts
- Acceptability to local community or general public
- Severity of the impacts (reversible or irreversible)

In all cases, the choice of the appropriate guidelines must be robust, defensible and relevant to the local situation. If there are no appropriate existing standards available, then the criteria should be developed and their use must be clearly explained in the EIA.

While doing impacts evaluation, it is important to understand the nature and characteristics of impacts on potential target areas, such as air, water, land, flora and fauna and human beings to understand the significance, importance and intensity (see Box: *Possible Evaluation Criteria for determining impact significance*).

Some criteria and standards for impact evaluation

Particulars	Standards for impact evaluation
Maintaining the air quality standard	Environmental Management (Air Quality Standards) Regulations, 2007[4]
Protection of water from pollution (waste water discharge, prescribe requirements for effluent treatment plant, establish minimum quality standards for different uses of water)	Environmental Management (Water Quality Standards) Regulations, 2007[5]
Water conservation and source protection (rainwater harvesting and recycling for domestic purposes, requirement of Water Use Permit necessary for diverting, damming, storing, abstracting or using water from surface or underground water source, requirement of permit of Groundwater for constructing, sinking, enlarging, or deepening a well or borehole in a Groundwater Controlled Area, Prohibits wastage of groundwater from any borehole, requirement of Discharge Permit for discharging effluents from any commercial, industrial or agricultural source or from any sewerage works or trade waste systems or from any other source into surface water or underground strata)	Water Resources Management Act, 2009[6]
Requirement of water meter for the purpose of measuring quantity of water supplied	Water Supply and Sanitation Act, 2009[7]
license for electrical installations in a building by the electricity authority	The Electricity Act, 2008[8]
Prevent fire and rescue	The Fire and Rescue Force Act, 2007[9]
Protection from HIV and AIDS	The HIV and AIDS (Prevention and Control) Act, 2008[10]
Worker protection (Compensation in case of disablement or death,employee suffering from occupational disease or accident gets rehabilitation benefits to restore health)	Workers Compensation Act, 2008[11]
Health, safety and hygiene of workers (requirement of medical examination for fitness, provide clean safe drinking water and sanitary conveniences to employee, provides and maintains first aid box/cupboard etc.)	The Occupational Health and Safety Act,2003[12]
Prohibit underage and forced employment, maternity leave for women workers	The Employment and Labour Relation Act, 2004[13]
License to open quarry for supply of construction material	The Mining Act, 2010[14]
Protection and conservation of forest reserve and private forest area (Requirement of permission for activities in a forest reserve for different purposes like erecting buildings or other structures, constructing roads and bridges, paths, waterways, railways or runways)	Forest Act, 2002[15]
Compensation to land loser	The Land Acquisition Act, 1967[16]
Efficient and orderly management of land use, sustainable land use practices, zoning, protection and sustainable use of resources	The Land Use Planning Act, 2007[17]
Standards of space and planning for residential areas, building lines, health facilities, education facilities, recreational facilities, golf courses, public facilities, service trade and Industries, etc.	The Urban Planning and Space Standards Regulations, 2018
Permit for the possession and use of Explosives	The Explosives Act, 1963[18], if applicable
Prohibits the discharge of pollutants into a water body, prohibits causing of any nuisance, which can be injurious to health existing on land, water and air, prohibits overcrowding in a building or premises, prohibits occupancy in a building until plans and specifications have been scrutinized by the authority for compliance with public health requirements and a certificate of occupancy has been granted.	Public Health Act, 2009[19]

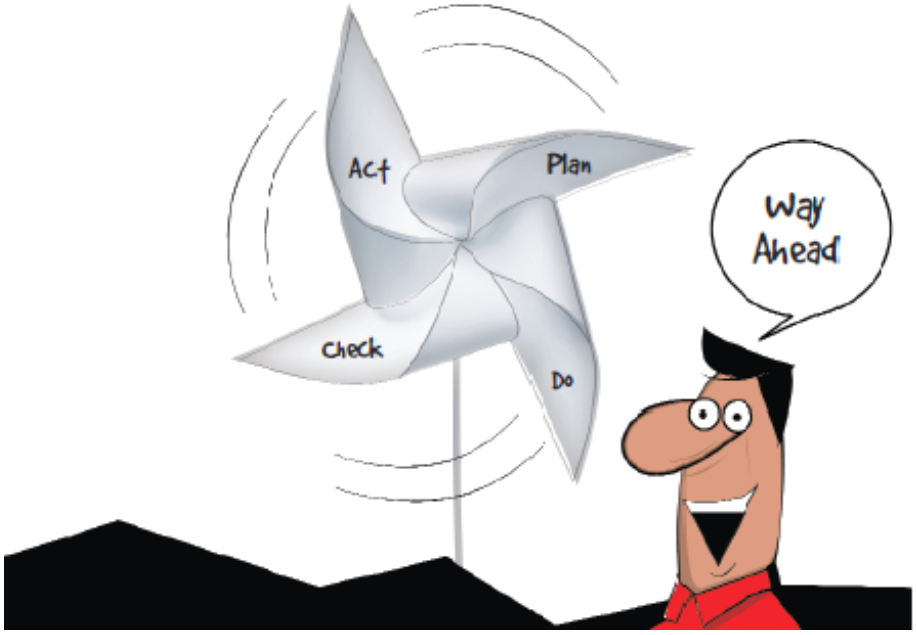
Note: List is not exhaustive

At the same time, it is also essential to find out the answer to the following three questions

- Are there residual environmental impacts?
- If yes, are these likely to be significant?
- If yes, are these significant effects likely to occur? Is their probability high, moderate or low?

Possible evaluation criteria for determining impact significance

- No impacts
- No significant impacts without or with available and practical mitigating measures
- Impacts, but significance not quantifiable
- Significant impacts even with available and practicable mitigating measures
- Impacts cannot be mitigated



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4.6 Environmental and Social Management Plan (ESMP)

An ESMP is a framework for the implementation and execution of mitigation measures and alternatives. The objectives of an ESMP are:

1. To ensure that mitigation measures are properly implemented
2. To establish a scheme and procedures for this purpose
3. To monitor how effective are the mitigation measures
4. To ensure that proposed mitigation measures comply with environmental laws and regulations
5. An adequate action when unexpected impacts occur

The ESMP outlines a plan for operation or execution of the recommended mitigation plan, including assigning responsibility, schedules and details out the estimated costs to execute the mitigation plan.

While developing an environment and social management plan for building construction project, environmental experts or firm should incorporate structural and non-structural mitigation measures or alternatives during pre-construction and construction stages of project development, both are equally important while developing the environmental and social management plan. For detailed information on mitigation measures refer ***Annexure 6: Good Practices in the Sector***.

Structural measures include site alternatives, changes in the design, engineering modifications, substitution and change in construction, automation and mechanization.

Non-structural measures include incentives, legal, institutional and policy instruments, corporate social responsibility (CSR), benefit-sharing, training and capacity building. For long term sustainability and to avoid long-term conflicts between local people and the project proponent, non-structural measures are very vital and are gradually being adopted.

The ESMP should also address the formation of a monitoring committee, with the objective of finding out whether different pollution-related issues and social development commitments related to health, education, infrastructure, employment, etc., are adhering to the time schedule or not. In case of delays, the reasons for the delays need to be identified and suggestions to be made for rectifying them.

An ESMP should contain the following:
1. An outline of all likely impacts
2. A detailed description of proposed mitigation measures
3. A time-line for completion of mitigation measures
4. Resource distribution and responsible department
5. A programme for surveillance, monitoring and auditing
6. Compliance with relevant standards
7. An emergency plan when the impacts are greater than expected

A planned matrix should be submitted by the project proponent (see *Table 18: Environmental and Social Management Plan reporting format*) in the prescribed format, which entails the impact severity, cost allocated and responsible authority for implementation and monitoring both.

Table 18: Environmental and Social Management Plan (ESMP) reporting format

Activity	Impact	Impact Severity	Proposed Mitigation	Timeline	Cost	Responsibility

4.6.1 Monitoring

A monitoring plan related to the predictions made in EIA for key environmental indicators for monitoring all significant impacts, *See Table 19: Environmental Monitoring Plan, needs to be chalked out.* The monitoring plan should also outline the need for monitoring, its duration and reporting procedures. The

programme for surveillance, monitoring and auditing should clearly identify the following:

1. Monitoring locations, including sample surveys—to assess the environmental and socio-economic impacts
2. Frequency of monitoring
3. Reporting frequency to competent authority
4. Provision for annual budget for environmental and social audit

Table 19: Environmental Monitoring Plan

Sr. No.	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (Tsh)
Demolition and Construction Phase								
Operation stage								
Total monitoring costs								

The mitigation measures to be successful for any regulatory instrument, clarity about the nature of the impacts and its significance are a must. Depending upon the nature of the impact, the mitigation measures should be designed and implemented.

Further, the Principal Regulation (49, 50, 56) has provisions for three types audits to ensure compliance after the EIA Certificate is issued, which are as follows:

(a) control audit, which is conducted once in five years and is being done by NEMC
(b) self-audit is done by proponent and it is submitted annually
(c) third type of audit which is referred as audit petition, undertaken by council in case of any complaints.

4.7 Public participation and stakeholders' consultation

Public participation and stakeholder's consultation is an essential part of the EIA process. It provides an opportunity to those who are directly or indirectly affected by the project to express their views on environmental and social issues. In many countries, the process of public participation is legally mandated, which holds true for the EIA process in Tanzania as well.

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4.7.1 Procedure for public participation during process of conducting an Environment Impact Assessment

Public hearing and stakeholder involvement is mandatory for all Type 'A', B1 (if an EIA is mandatory) and special category projects. In case of B1 type project, during scoping report preparation, the subsidiary regulation mandates to provide stakeholder involvement. The Environmental Impact Assessment and Audit Regulations, 2005 laid down the procedure of ensuring public participation during the process of EIA. As per Regulations, the proponent shall seek the views of the public while conducting an environmental impact assessment study (Regulation 17). The Council, on the receipt of the environmental impact statement, shall invite the general public for comments (Regulation 23). The comments shall then be compiled by NEMC and be the basis for review of the environment impact statement (Regulation 27).

The process of public participations during EIA process, are as follows:

1. During the process of conducting an environmental impact assessment study, the developer or proponent in consultation with the Council, seeks the views of any person who is or is likely to be affected by the project.
2. The developer or proponent shall –
   a. publicize the project and its anticipated effects and benefits by-
      i. posting posters in strategic public places in the vicinity of the site of the proposed project informing the affected parties and communities of the proposed project;
      ii. publishing a notice on the proposed project for two successive weeks in a newspaper that has a nationwide circulation; and
      iii. making an announcement of the notice in both Kiswahili and English languages in a media with a nationwide coverage for at least once a week for two consecutive weeks;
   b. hold, where appropriate, public meetings with the affected parties and communities to explain the project and its effects, and to receive their oral or written comments;
   c. proponent must ensure that appropriate notices are sent out at least one week prior to the meetings and that the venue and times of the meetings

are convenient for the affected communities and the other concerned parties; and

d. ensure, in consultation with the Council, that a suitably qualified co-ordinator is appointed to receive and record both oral and written comments and any translations of it as received during the public meetings for onward transmission to the Council.

3. Without prejudice to the preceding provisions of this Regulation, the Council may issue notice to the members of the public to participate in all steps of conducting an environmental impact assessment.

According to Regulation 23 of Principal Regulation, an empowered Council is to seek general public for comments on the receipt of the environmental impact statement. Public hearing — once the EIS report is submitted to council, council may take a call whether to undertake a public hearing or not.

According to Regulation 26 of principal regulation, the Council shall consider an environmental impact statement and all the comments received and determine whether to hold or not to hold a public hearing in accordance with regulation 27.

The Council shall hold a public hearing on the environmental statement if-

1. as a result of the comments received it is of the opinion that a public hearing shall enable it to make a fair and just decision; or
2. it considers it necessary for the protection of the environment.

During the hearing, the Council shall:

1. receive submissions and comments from any interested party;
2. ask questions and seek answers respecting the environmental impact of a project or an undertaking; and
3. provide information which assist the hearing panel to prepare recommendations to the Minister.

Upon receipt of both oral and written comments, the Council conducts a public hearing, **according to Regulation 27 of principal regulation, which are as follows:**

1. The public hearing is presided over by a suitably qualified person appointed by the Council.
2. The date and venue of the public hearing shall be publicized at least one week prior to the meeting-
   a. by notice in at least one daily newspaper of national circulation and one newspaper of local circulation, television and other means of mass communication;
   b. by at least two announcements in the Kiswahili and English languages.
3. The public hearing shall be conducted at a venue convenient and accessible to people who are likely to be affected by the project.
4. A proponent shall be given an opportunity to make a presentation and to respond to presentations made at the public hearing.
5. The presiding officer shall, in consultation with the Council determine the rules of procedure at the public hearing.
6. On the conclusion of the public hearing, the presiding officer shall compile a report of the views presented at the public hearing and submit the report to the Director General within fourteen days from the date of completion of the public hearing.

It is important to note that any person may attend either in person or through a representative and make presentations at a public hearing provided that the presiding officer shall have the right to disallow frivolous and vexatious presentations.

Apart from public participation in the EIA process, the Tanzanian Regulations attempt at mainstreaming gender in EIA. The project screening criteria of the 2018 Regulations inquires about the impact a project will have on a social group or gender (Schedule 2). Moreover, an environmental impact statement submitted by the proponent to the council should incorporate a social analysis of the project. This helps in estimating in advance the social consequences of the project development on the public including gender desegregation.

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With regard to EIA, it is smart economics to involve both women and men. They both have different needs and knowledge of utilizing the environment. Women have a very important role in protecting and managing natural resources in their surroundings. EIA processes can provide a good opportunity to address gender issues at an early stage of project planning, and explore means to reduce adverse impacts. Refer **Annexure 7*: Framework for gender inclusion in different step of Environment Impact Assessment***.

5. Structure of Environment Impact Statement (EIS)

The findings of an EIA study need to be documented in a report and communicated to the relevant stakeholders such as regulatory agencies, policymakers, the project-affected populations and people with plausible interest in the project. A good EIS report is one which is to the point, offers straightforward answers and is easily read and understood by all stakeholders.

The structure of an EIS report depends largely on the Terms of Reference (ToR) agreed to by the regulatory authority and the project proponent. Therefore, it is important that the ToR itself is clear and succinct, focuses on significant impacts and mitigation measures and avoids unnecessary information. An EIS is essentially a technical document. It is all the more important, therefore, that the document communicates the EIS findings in a simplified, clear and concise manner.

According to Regulation 21 of Principal Regulation, a developer or proponent must submit 15 original copies along with an electronic copy of an environmental impact statement to the Council in Form No. 2 as specified in the Third Schedule of parent regulation accompanied by the prescribed fees. The Environment Impact Statement must be in compliance with approved Terms of Reference and accompanied with non-technical executive summary both in Kiswahili and English language stating the keys finding, conclusion and recommendation of assessment.

According to Regulation 18 of Principal Regulation, a developer or proponent submits the environmental impact statement to the Council, an incorporating but not limited to the following information:

1. the project and the activities that it is likely to generate;
2. the proposed location of the project and reasons for rejecting alternative locations;
3. a concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project;
4. the objectives of the project;
5. the technology, procedures and processes to be used, in the implementation of the project;
6. the materials to be used in the construction and implementation of the project;
7. the products, by products and waste generated by the project;
8. a description of the potentially affected environment including specific information necessary for identifying and assessing the environmental effects of the project;
9. the environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short term and long term effects anticipated;
10. alternative technologies and processes available and reasons for preferring the chosen technology and processes;
11. analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies;
12. an environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, timeframe and responsibility to implement the measures;
13. provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other development projects;
14. the measures to prevent health hazards and to ensure security in the working environment for the employees and for management of emergencies;

15. an identification of gaps in knowledge and uncertainties, which were encountered in compiling the information;
16. an economic and social analysis of the project;
17. positive impacts and how to enhance them; and
18. Any such matters as the Council may require.

The format of environmental impact statement must be styled and contain the following information:

1. Format of the environmental impact statement:
    a. executive summary;
    b. acknowledgement;
    c. acronyms;
    d. abbreviations;
    e. introduction;
    f. project background and description;
    g. policy, administrative and legal framework;
    h. baseline or existing conditions;
    i. assessment of impacts and identification of alternatives;
    j. impacts management or environmental mitigation measures;
    k. environmental and social management plan;
    l. environmental and social monitoring plan;
    m. resource evaluation or cost benefit analysis;
    n. decommissioning;
    o. summary and conclusions
    p. references;
    q. appendices;
2. Cover page of the environmental impact statement must contain following:
    a. title of the proposed project;
    b. location of proposed development;
    c. developer;
    d. lead consultants;
    e. physical address;
    f. contact address and phone;
    g. date of submission.

The regulation also provides format for Executive summary in Kiswahili and English language, which must contain the following:

1. title and location of the project or undertaking;
2. name of the proponent and contact;
3. names and addresses of experts or firms of experts conducting EIA;
4. A brief outline and justification of the proposed project or undertaking showing-
    a. a brief description of the project environment;
    b. project stakeholders and their involvement in the EIA process;
    c. explanation on why some impacts are not addressed;
    d. list of local planning authorities and other people and organizations consulted;
    e. results of public consultation;
    f. description of the major significant impacts;
    g. alternative considered;
    h. recommendations and plan for mitigation of the impacts;
    i. environmental and social management;
    j. proposed monitoring and auditing;
    k. resource evaluation or cost benefit analysis; and
    l. decommissioning.

6. Reviewing an EIS report

REVIEWING AN EIS REPORT FOR A BUILDING CONSTRUCTION PROJECT

According to regulation 23 (1) of the principal regulation, the council upon receiving EIS, submits a copy to the relevant Ministry, public institution and general public for reviewing and giving comments on the EIS to ensure that it complies with ToR developed, based on which the council proceeds to determine the application.

According to regulation 24, different review areas have been provided on the basis of which the council has to review the EIS report. The council may decide to conduct site visit for the purpose of review.

The purpose of reviewing an EIS report is to take decisions with respect to the following:

1. Should the project be cleared in the same state as proposed by the project proponent?
2. Should the project plan be modified to reduce the impacts and then cleared?
3. Is the 'no project' option justified, considering the social and environmental costs vis-à-vis the benefits of the project?
4. If the project is cleared, then what conditions may be prescribed for compliance during design stage, construction and operation of the project?

While reviewing the EIS report, the following key aspects need to be carefully examined:

1. Has the EIS report evaluated the beneficial and adverse impacts of the project, clearly?
2. Which are the unavoidable adverse impacts? Are they acceptable?
3. Is the proposed mitigation plan sufficient to manage and control all adverse impacts?
4. What kinds of safeguards need to be incorporated to ensure that the mitigation plan is implemented effectively?
5. What are the parameters that need to be monitored during the construction and during operation phase so that the state of the environment can be studied throughout the project life?
6. Is the project acceptable to local communities?
7. Are the concerns of the local communities genuine and has the EIS report adequately addressed these concerns?
8. Will the project improve the socio-economic status of the local communities?

For more details, see Table 20: Checklist for reviewing the EIS report of building construction project.

Table 20: Checklist for reviewing the EIS report of building construction project

Item	Review Question	Comments (If question is not adequately addressed, what further information is needed?)
1. General information		
a. Executive summary (It incorporates different aspects of the project including the foreseeable environmental and social impacts, mitigation measures and benefits)	Has the executive summary of an EIS report described in detail the nature and scope of the project, its characteristics and the environmental and social impacts arising from the project? Note: Scrutinize the report and check whether all the concerned issues have been addressed in the executive summary. Significance: The executive summary of an EIS report should be prepared in the local language so that it can be understood by a larger group of people. The locals should know details about the project and its environmental and social implications, so that they can raise valid questions during the public consultation.	
b. Terms of Reference (ToR)	The reviewer must establish whether the EIS report has complied with the prescribed ToR.	
c. Statutory clearances	Has the project developer taken the approvals or No Objection Certificate (NOC) from various concerned local government, ministry or departments? Significance: This will help the reviewer to understand applicable regulatory approvals required and the status therewith. It also helps council to understand permit and licence conditions.	
d. Project proponent	Experience in building construction projects and track record on social and environmental fronts in other projects.	
e. Information about the EIA consultant	Disclosure of name and contacts of organization/consultant preparing the EIS report, qualifications and experience of experts involved in the EIS assessment and report preparation	
f. Cost of the project and donors	Has the report described the financial cost of the project including donors or banks involved in the funding?	
g. Declaration	Does the report include a declaration stating that the information disclosed in the EIS report is correct?	
2. Project description		
a. Location	Has the report provided sufficient reason for site selection including environment and social issues associated with each site? Is given justification adequate and reasonable?	
b. Maps (cartographic) representations of the following	While reviewing the questions below, the reviewer should check the adequacy of information, quality of maps, the appropriate scale, ground verification (wherever possible), source and date of the map. Some of the common review questions are: • Has the report provided a map specifying the location of the project? Does it clearly mention the Region, District / Municipality with latitude and longitude? • Has the report provided a study area map indicating features such as locations of human settlements, defense site, archaeological, historical site etc? • Has the report provided a map indicating the detailed land use pattern of the project site and study area? Is given information adequate and reasonable? • Has the report provided a map marking the sensitive zones in the study area—such as forests, protected areas, migratory areas, tourist resorts, important landscapes, historical sites, parks, international borders, etc.?	

	• Has the report provided a contour map of the plant site? • Has the report provided a building layout plan drawn to a readable scale or as appropriate indicating, plot coverage, building foot print like open area, access roads, internal access roads, underground cables, substations, amenities, additional structures including all utilities? • Has the report provided a map indicating the flood ability of the area, if applicable?	
c. Activities during project construction stage	• Has the report provided a schedule for each phase of construction and operation for project and ancillary facilities? Does it include the environmental issues associated with each ancillary activity, wherever possible such as mobilization, land clearing, tree cover removal, shifting of utilities, transportation of material, establishment of construction camps, stockyards, installation of plants and equipments, blasting (if applicable), borrow and spoil disposal, excavation, foundation, concrete work, stabilization of disturbed areas? Note: Check whether all environmental and social concerns have been addressed. • If applicable, check whether the description of concrete plants, hot mix and rock crushers, their capacity, fuel requirement including the environmental measures for pollution abatement and control have been provided in the report? Are given information and listed mitigation measures adequate? • Has the report provided details on types of equipments required for proposed project during the construction stage, the environmental implications associated and pollution control measures? Are pollution control measures adequate? • Has the report provided details of the expected quantity of raw materials to be used during construction of the project and environmental implications associated with each activity? Has the report discussed the pollution controls measures recommended for reducing air, noise and water pollution? Are proposed measures adequate? • Has the report provided the water balance, detailing the water usage during the construction and operation stage and the source of water? For more information refer Annexure 1: Environment and Social Management Plan • Does the report contain the details of the workforce to be employed during project construction and operation? Also is there information on employment potential during the land clearing and construction of project for locals? Check the provisions or amenities provided by the proponent in the labour camp to reduce pressure on local resources during construction of the project.	
d. Technology to reduce environmental footprint	• Has the report provided detailed information on the technology being used and technical details for reducing environmental footprint? • Water resource management • Energy efficiency • On site renewable energy • Wastewater treatment and reuse • Solid wastes management • Green cover • Use of sustainable building material • Management of construction and demolition wastes • Ozone depleting substance • Use of Certified green building materials, products and equipments Is the given information adequate? • Has the report provided details on the foundation with a clear description of the size, depth of foundation, quantity of earth to be extracted and mode of disposal? The reviewer should check the pollution control measures and safety aspects proposed. Are proposed measures adequate?	

	Note: If the site is falling in a seismic zone, then check whether the design foundation has taken into consideration the seismic factor or not. Note: If the site is falling in volcanic area/coastal/water body, then check whether the adequate setback or safety factor has been taken into consideration or not. • Has the report described the laying of cables with a clear description of electrical safety hazards? Are safety measures adequate?	
e. Site characteristics	• Has the report mentioned the total land requirement for the project, land use pattern of the acquired land and study area, separately? If private land is being acquired, then check information on land ownership or loss of livelihood including the compensation being offered to the land owner. Are they adequate? • Has the report provided details on characteristics of the catchment area? Does the detail include terrain characteristics and drainage pattern? Is given information adequate? Check the areas vulnerable to erosion or areas prone to landslides or other risks. • Check the distance of the project from ecologically sensitive areas and key installations such as airports, defence installations, highways, wetlands, National Parks and Sanctuaries, biological corridors, archaeological sites, critical water-shed areas or any other important installations. In addition to the areas / zones / installations mentioned above, the reviewer should also check distance from following sites. If impacts are envisaged, are mitigation measures adequate to reduce those impacts? Note: Internationally, many countries follow a setback distance from the key installations to avoid environmental and social risks. Check the following information, wherever applicable: • If forest land is diverted, then check whether the project site or study area supports any unique habitat, endemic, threatened or declining species or species of high economic / ecological value, wildlife corridors or nesting, breeding, foraging sites for birds or locations favoured by migratory birds either in project area or in immediate neighbourhood. For details refer Annexure 2. Is information provided in the report adequate? If yes, then will the project cause significant impacts? If yes, then are impacts manageable? (Yes/ No). If yes, then, review the quality and applicability of the management plans. If not, then ask the proponent to resubmit. Note: Check the quality of data, duration and season of data generation • If the site preparation requires the felling of trees, then, check the following information in the report: a. Number of trees to be cut down b. Plant species and age of trees c. Are they protected/endangered species? If yes, was information given about their characteristics. Note: While reviewing the biodiversity section, the reviewer should check the following: a. Quality of data b. Extent of field surveys and use of scientific techniques c. Stakeholder consultation like with the forest department and local people d. Interpretation of data	
f. Baseline data collection	Note: While reviewing the baseline data, the reviewer should check the following basic information in an EIS report: a. Whether the report has clearly, concisely and adequately depicted the existing environmental and socio-economic status of the study area with appropriate data, maps and diagrams? b. Is the secondary data given in the report relevant? Check the source of data and the year in which it was generated c. Is the primary data generated using appropriate monitoring plans and methodologies by an appropriate agency? Is there a basis for questioning the quality and authenticity of the data?	

	Reviewer reviewing the following details, should ask: • Has the report provided data on surface water characteristics including an inventory of natural drains, streams, springs, water crossings and other water bodies in the project and adjoining areas? Is the given information verified and authenticated by the local or regional water resource department? Is there any possibility to avoid for alignment or diversion? • Has the report provided information on potential project activities, which may cause contamination of water resources? Is the given information adequate? Are mitigation measures sufficient to avoid future contamination? • Information on quality and characteristics of top soil to be generated during the construction of access roads, internal roads, erection of towers, substations and other areas. Also, are measures for conservation and use included? Is the given conservation plan adequate? Air and Noise quality • Has the report provided information on ambient air quality such as PM10, PM2.5? Is there information on existing meteorological conditions such as temperature, humidity, rainfall and wind speed and direction, wherever applicable? While reviewing the above data, reviewer should check the following information: a. Have all the parameters been covered? b. Has the location of the monitoring station been appropriately fixed, considering the sensitive receptors and existing meteorological conditions? c. Was the air quality data generated using appropriate sampling methods and testing methodologies? d. Were the results—meteorological and ambient air data—interpreted correctly or not? • Has the report provided details on potential equipments and activities that may cause noise pollution? Check whether the EIS report mentions about the PPEs provided to the workers? If yes, check whether provision for providing earmuffs / earplugs are there or not? Check whether the details of the silencers or enclosures for noise generating machines are adequate or not. • Has the report provided information on potential risks and accidents anticipated during various stages of project development? Is the given information adequate? • Is the socio-economic and cultural information / data generated as per approved ToR? The reviewer should check the following data/information in EIS. a. Has the report provided information on the number of households or families to be displaced, if land acquisition is involved? b. Check data / information on movable and immovable properties to be affected c. Public and community properties and infrastructure likely to be affected d. People who are likely to lose their employment or livelihood or likely to be alienated wholly or substantially from their main sources of trade, business or occupation due to acquisition of land. Note: Check whether the socio-economic data is generated by using an appropriate field survey and public consultation? Has the data been interpreted correctly or not? Others • Check information on quantity and characteristics of solid and / or hazardous wastes likely to be generated including from utilities, if applicable. Is the given information adequate?	

g. Impact Assessment	While reviewing the impacts assessment, the reviewer should check the following: a. Whether the impacts are clearly characterized, wherever relevant, in terms of magnitude, extent, duration, frequency, probability and importance? b. Does the report clearly mention the basis on which the impact predictions were made, for example, case studies, models, literature, expert analysis, etc.? Are the assumptions made for impact prediction, clearly indicated and justified? Is there a basis for questioning the method used for impact prediction? Check in detail the following aspects in the impacts assessment section: • Has the report clearly described the impacts due to land acquisition? If applicable. Are all impacts properly identified, predicted and evaluated? • Has the report assessed the impact of a project on the local biodiversity of the area? If yes, was the quality of assessment adequate? • Has the report discussed the impact of project activities on local water bodies? Check if the impact is assessed in terms of magnitude, extent, duration, frequency, probability and importance. • Has the report assessed the impact of noise on workers and the nearest human settlement? If yes, was the quality of assessment adequate? • Has the report assessed the impacts of the project and allied activities such as land clearing, civil works, materials handling, construction of access roads, erection of tower, and construction of sub-station transportation, crushing and loading on ambient air quality including workers and nearest human settlements? Are impacts assessed in terms of magnitude, extent, duration, frequency, probability and importance?. • Has the report assessed the impact of movement of heavy vehicles on local surroundings and traffic including increase in traffic during operation? Is the given information adequate? Are impacts assessed in term of magnitude, extent, duration, frequency and probability? • Has the report assessed the impact of the project on local environment due to generation of solid and liquid wastes? Are the assumptions made for prediction clearly indicated and justified? Reviewer should also check method used for impact prediction? •Has the report assessed the impact of people's migration or growth of development during project operation? Are the assumptions made for prediction clearly indicated and justified? • If applicable, the impact of a project on the hilly terrain due to slope de-stabilization caused by site preparation, civil works, construction of access roads and other activities, have to be spoken of • Risk and hazard associated with increase in traffic movement, sub-station and other allied activities including potential occupational health and safety issues that may arise out of a. Electrical hazards b. Working at a height and road accident c. Fire/explosions d. Transformer oil e. Consequences in case of emergency like flood, cyclone, landslide, earthquake etc.	

h. Environmental and Social Management Plan (ESMP)	While reviewing the mitigation measures and ESMP, the reviewer should check for the following general information: a. Whether ESMP has discussed the mitigation measures for each individual impact to be examined while reviewing the EIS b. The timeline for completion c. The departments responsible for implementation d. Allocated budget for the EMP e. Post-monitoring provisions and reporting to the concerned regulatory authority • R&R plan, if displacement is involved. Check whether the plan has included details of the compensation and basic amenities at their settlement colony, (such as housing, educational facilities, infrastructure and alternative livelihood potential), a clear timeline for implementation, responsibility, budgets and grievance redressal mechanism • What measures and initiatives have been proposed in the labor colony during construction stage. Are proposed measures adequate? • What measures and initiatives have been proposed to reduce landslides and to ensure slope stabilization during construction of access roads and towers on a hilly terrain, wherever applicable? Is the given management plan adequate? • What measures and initiatives have been proposed to reduce fugitive emissions during land-clearing, civil works, handling/transporting of construction material, construction of access roads, quarry operations, hot mix and batch plant, wherever applicable? Are given management plans adequate? • What measures and initiatives have been proposed for the control of erosion and run-off from the area where construction is to take place? (especially, if there is a water body or agricultural land adjoining the project site). Are given management plans adequate? • Management plan for noise abatement and control, wherever applicable. Are given management plans adequate? • Plan for topsoil utilization and conservation. Are management plans adequate? • What measures and initiatives have been proposed to reduce carbon footprint of the project? Are the given measures adequate? • What measures and initiatives have been proposed to improve energy efficiency of the project? Are the given measures adequate? • What measures and initiatives have been proposed to reduce water footprint of the project? Are the given measures adequate? • What measures and initiatives have been proposed to increase green cover and improve landscaping of the project? Are the given measures adequate? • What measures and initiatives have been proposed for the use of sustainable building material? Are the given measures adequate? • What measures and initiatives have been proposed for solid waste management including construction and demolition waste? Are the given measures adequate?	

	• What measures and initiatives have been proposed for fighting and traffic management? Are the given measures adequate? • Mitigation plan to reduce, avoid or minimize spills and leaks from diesel, transformers, sub-stations, etc. Are management plans adequate? • Plan for reclamation of debris and spoil, if applicable. Are given management plans adequate? • Plan for quarry related activities including its restoration, if applicable. Are given management plans adequate? • Measures against potential risk and hazards • Check the surveillance and monitoring programme including fund requirement, manpower, monitoring schedule, frequency, parameters to be monitored and equipments required for surveillance and monitoring programme • Key components: Does the report include the following: a. Year-wise capital and revenue budgets for environmental protection? b. Year-wise budget allocated for training and awareness raising programmes? c. Year-wise budget allocated for socio-economic development of the community?	

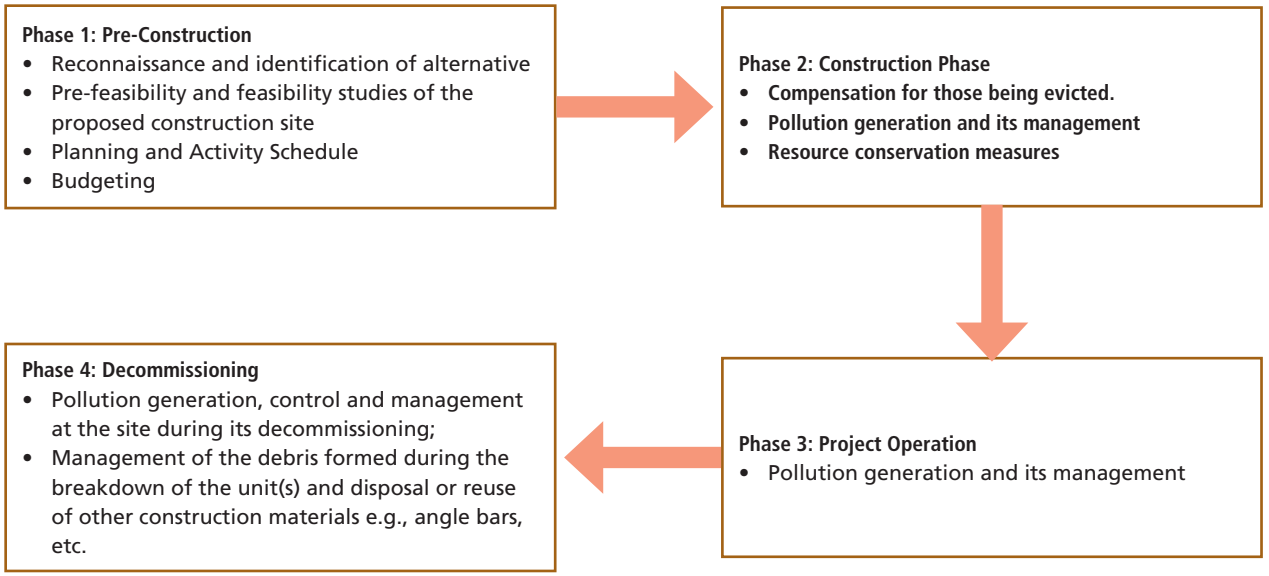
Annexure (s)

Annexure 1: Potential Environmental and Social Impact

The magnitude of environmental and social impacts of construction sector depends on type, nature, scale and location sensitivity.

A typical building construction project entails 3 – 4 phases. These phases and the examples of specific environmental impacts associated with each phase are summarized in the figure below:

Figure 1: Environmental Impact associated with building and construction projects in different phases



The activities during pre-construction involves performing preliminary planning and engineering in order to define the project, identify potential issues, and analyse cost. The major activities of the pre-construction phase are:

- Decision on site location
- Storage of materials
- Preparation of various plans like site plan, landscape plan, circulation plan, etc.
- Energy efficient and conservation techniques to be applied
- Budgeting

The Construction Phase is the period during which the contractor (or principal contractor) takes control of the construction site to carry out the works. The various activities at this stage that have influence on the environment include:

- Site preparation,
- Construction of access roads,
- Removal of topsoil,
- Erection of structure,
- Transmission lines and movement of vehicles

Air pollution is caused due to the release of emissions during site preparation, construction of access road, civil activities, heavy earthmoving vehicle movement, RCC foundation, batch plant, storage yard, utilities etc. However, these impacts are usually temporary and localised, except the permanent changes they might introduce in the local landscape and land use patterns at the project site. These include erosion, compaction, habitat fragmentation, borrowing, and quarrying. These impacts should be given due consideration, wherever applicable. The soil and groundwater contamination may be caused due to the disposal of liquid, solid and hazardous materials/wastes.

Township project or industrial estate is land intensive and may cause displacement or loss of livelihood, if proposed project site requires large areas and site is occupied by human settlements or agricultural land. If such a project is proposed to be set up in a forest area or in the coastal area, concerns such as impacts on biodiversity become crucial.

The magnitude of impact of construction projects in terrain like hills are much higher compared to that in plain areas. In hills, activities such as construction of access, erection of transmission lines, cutting and felling trees, etc. can lead to siltation of water bodies and slope destabilization. They can also trigger landslides and pose a significant threat.

Generation of solid and liquid wastes, if discharged untreated would cause air, water and land pollution. The installation of DG sets, transformers or substations contributes to significant amount of noise and waste generation (like oily sludge and transformer oils), which have the potential to cause soil and groundwater contamination.

The impact on water resources arise most often during the construction stage and is prevalent during the operational phase too mainly due to untreated sewage, septic tanks, leakage from underground fuel storage or runoff from wastes site (see Fig 1: Modification of water table due to major urban development projects). The impact of noise environment depends upon the type of cover, land-use pattern, traffic volume, construction and maintenance activities, distance from the sensitive receptors and speed of vehicles.

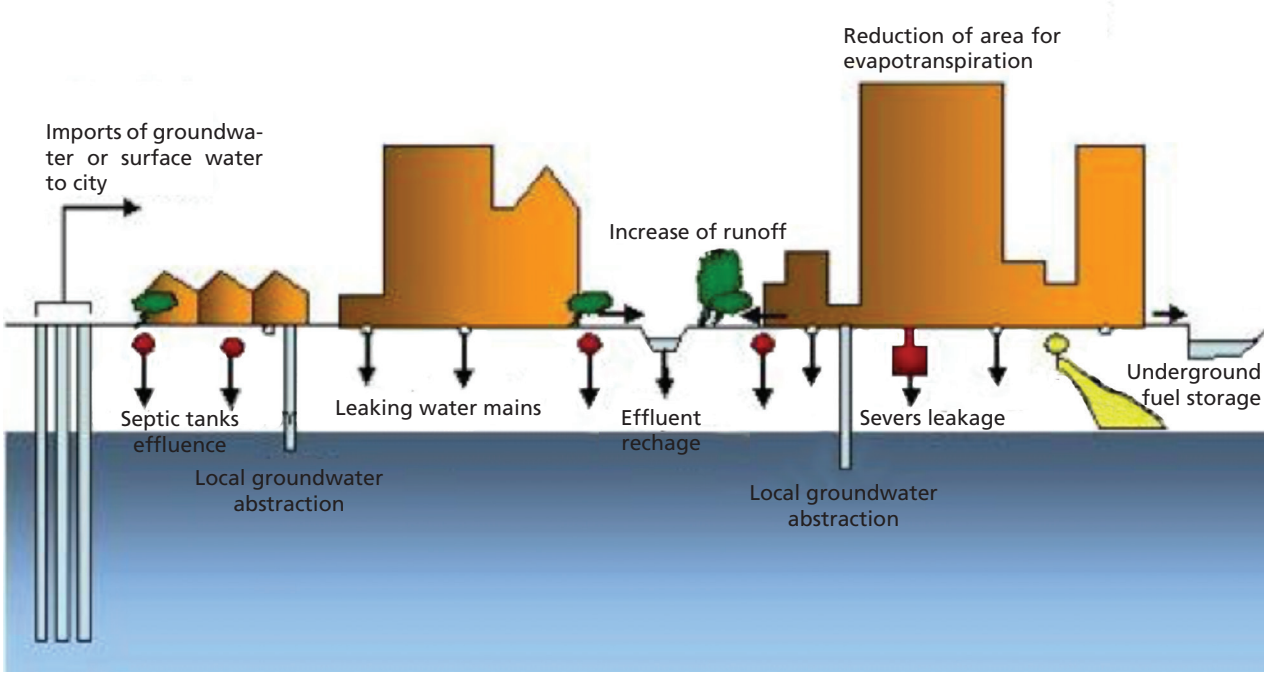
In the construction sector, the wastes generated during construction phase waste include excavated and demolition material and while at the operational phase, the wastes may comprise of domestic, commercial and biomedical wastes, depending upon the type of the project. Hence, different types of wastes need to be handled as per their needs and regulatory requirements.

The type of wastes, which are generated, can be classified mainly into four categories (a) construction or demolition waste, i.e., massive and inert waste (b) Municipal waste, i.e., biodegradable and recyclable waste (c) hazardous waste, and (d) E-waste.

The construction and demolition waste includes debris, concrete (often recycled and reused at the site), steel and other metals, pallets, packaging and paper products, fluorescent tubes, wood beams, joists, studs, baseboards, cabinets and cupboards, railings, brick, doors and casings, interior windows, bathroom fixtures, light fixtures, ceiling grid and tile, furnishings, replant trees, shrubs.

According to an estimate, a minimum of 4% of the total site area should be allocated for storage and pre- treatment of the waste. This storage area should be

Figure 2: Modification of water table due to major urban development projects



Source: Doni P.E. Putra and Klaus Baier, 2009. Research Journal: The influence of uncontrolled urbanization on groundwater resources using the example of the Indonesian megacity Yogyakarta

covered and the pollutants from the waste should not affect the surroundings. The generation of E-waste includes various types of electrical and electronic wastes generated from the building, offices, commercial place, hospital which includes PC in case of offices and homes, Xerox machine components from office and shops; it should be collected separately and send to recyclers. As a good practice, there should be provision for storage of E- waste in the building.

Migration of workers and influx of people may also increase risks of spread of new diseases like HIV and AIDS, including those associated with law and order, and other social abuse like increase in prostitution.

Another important risk which may cause significant impacts on human lives is natural hazard such as earthquake, or cyclonic storm, or flood or inundation, or landslides/ mud flows. Hence, it important that the structural design of foundation, elements of masonry, timber, plain concrete, reinforced concrete, pre-stressed concrete, and structural steel should conform to the general structural safety of the national building bye-laws of the country.

Some positive impacts of building construction project includes increase in job opportunity skilled; semi-skilled and unskilled labour both during construction and operation phases of the project, infrastructure development, and improvements in mobility, escalation of property rates, improvement in living standards etc.

Today, the concept of green building is gaining popularity with objectives to reduce resource footprint of building and construction sector. Some of the salient features of a green building are (a) minimum disturbance to landscapes and site condition (b) use of recycled and environmental friendly building materials (c) efficient use of Water and Wastewater Recycling (d) use of energy

efficient and eco-friendly equipment (e) use of renewable energy (f) water conservation (g) indoor air quality for human safety and comfort (h) effective controls and Building Management Systems.

A general checklist of the likely project impacts should be made for the each phase of the construction and based upon its significance the mitigation measures should be planned. A sample matrix of such checklist is given in Table 1.

Table 1: Matrix for impact assessment in different phases

Environmental Aspect	Pre-Construction	Construction Phase	Project Operation	Decommissioning
Land				
Land use				
Slope				
Natural drainage				
Water				
Pollution				
Surface flow				
Water Balance				
Air				
Quality				
Pollution				
Noise				
Soil				
Soil loss				
Contamination Compaction				
Bio-Diversity				
Loss of Flora				
Loss of Fauna				
Extinction of species				
Habitat Alteration				
Population and Social Dynamics				
Population size				
Diseases				
Quality of Life				
Employment				
Utilities				
Others				
Employment opportunity				
Economy				
Landscape design				
Traffic and roads				
Solid waste				
Energy				
Ecological				
Cumulative				

Source:- An Environmental Impact Assessment-Study Report By Westlands Skye Development Limited, December, 2015 And Sector Guidelines For Environmental Impact Assessment (Eia) For Housing Projects In Rwanda.

Building and Energy Linkages

Building and energy linkages have drawn more attention given the raging global concerns over climate impacts of cities and energy security. Globally, energy demand is expected to grow more rapidly in cities due to growth in urban population, lifestyle changes, and increase in the level of economic activities. The energy consumption in the cities are ever increasing and the overall consumption of energy in cities is estimated to be three-fourth of world energy by 2030.

The typical values show that office, retail and hotels are high end users of energy. But residential buildings are expected to have a very broad bandwidth given the range of low cost housing to high income housing.

The key challenge of energy management in buildings is how to minimize energy use at a higher comfort level. According to Bureau of Energy Efficiency (BEE), India, most commercial buildings in India have Energy Performance Index (EPI) of 200 kwh/sqm/year or higher. BEE considers 180 kwh/sqm/year as the typical national average and states that the buildings in North America and Europe have EPI of less than 150 kwh/sqm/year due to overall efficiency gains.

Energy consumption in buildings needs to be understood in terms of embedded energy that varies according to the building material as well as direct use of energy during building construction and operations phases. It is possible to select materials and architectural designs that can help to improve thermal efficiency of the buildings and reduce energy use.

The direct use of energy in building operations for instance, varies between residential and commercial buildings. Range of use is more diverse in residential buildings. In commercial buildings lighting, heating, ventilation, and air conditioning dominate the energy consumption. Only lighting and air conditioning can account for 80% of the energy consumption in typical commercial buildings. But in residential buildings more diverse use dominate—lighting, A/C, fans, cooler, refrigeration, TV etc. In fact, in residential buildings lighting and fans use up the maximum energy.

Significant energy saving potential exists in building construction sector. Different research studies carried out shows that existing buildings have 25 to 50% energy savings potential. Studies have also begun to appear on the potential Green House Gasses (GHG) savings from energy efficiency improvement in the building sector.

Energy audits: The biggest challenge in any resource conservation effort in buildings would be to monitor resource use during the operational phase. Environment clearance will require supportive tools to be able to ensure that the intended objectives of environmental assessments are met. Energy audits must be made mandatory for compliance reports that the project proponents are expected to file.

Building Water Linkages

Another key resource impact of buildings is water both as intake and waste generation.

Water is a very essential element in the construction phase of any building which uses concrete and brick as its building materials. Actual pattern of water use during construction phase will vary across building types. All stages

in the construction industry starting from the foundation, masonry, curing, concreting, whitewashing, to laying of roofs and flooring require use of water. Water demand is generally 10 to 20 % of the total volume of masonry and concrete used in a building. Similarly, water is primarily used in the concrete mix to start the hardening process through the hydration of cement. The total water requirement for the composition of concrete mix is dependent on the aggregate size and shapes, amount and quality of cement, well graded versus gap graded mixes of concrete and admixtures.

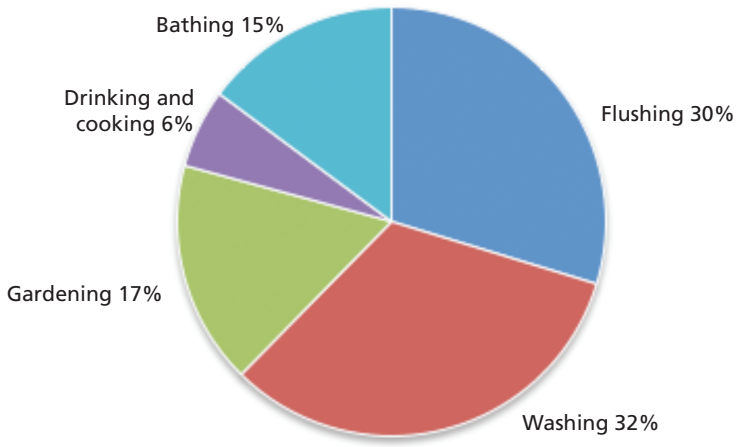
Curing and mixing of concrete is one of the most water intensive phases in the building construction process. This demand can also be further reduced with the use of modern technologies like membrane curing and sprinkler techniques.

Instead of pouring water over concrete structures, sprinkler system can be used. Concrete structures can also be covered with thin cloth or gunny bags and then water should be sprayed on them. This would help prevent loss of water by evaporation and avoid water rebound. Developers are advised to reuse and recycle the water in construction sites to reduce the fresh water use.

Water is used during the operational phase of the buildings as it is directly related with the lifestyle of the occupants. Building regulations would usually address all types of water and wastewater categories in buildings—grey water, black water and storm water. Potable water is the drinking water, while grey water is the domestic wastewater from bathroom fixtures (taps, showers and baths), laundry fixtures (washing machines) and kitchen facilities (such as sinks and dishwashing machines). Black water contains waste discharges from the human body, which is collected through fixtures such as toilets and urinals, while storm water refers to runoff due to rainfall collected from roofs, impervious surfaces and drainage systems.

The average requirement has been calculated based on various parameters and for various categories, ranging from rural to urban, size of the city, type of toilet, type of sewerage system etc. requirements. In the United Kingdom (UK) for instance 80 – 100 lpcd is seen as the desirable target in residential buildings. In India the standard is 135 lpcd. *See figure below.*

Graph 1: Matrix: Break up of 135 lpcd water consumption for India



Source: Anon, 1999, Manual on Water Supply and Treatment, Third Edition—Revised and Updated, Central Public Health and Environmental Engineering Organization, Ministry of Urban Development, New Delhi

Broadly, studies show that toilets and bathrooms are the biggest water guzzlers in a house, with flushes, taps and showers devouring more than 60 – 70% of total water use. Water efficient fixtures are just one of the many aspects in the building's water conservation and efficiency improvement. Water efficiency also involves conserving water by operationalizing water saving technologies and actions. A study on European water saving potential commissioned by the EU executive and published in August 2007 estimates that water efficiency could be improved by nearly 40% via technological improvements alone, and that change in human behaviour could increase those savings further. The benefits of implementing water efficiency initiatives in buildings may include cost savings on water bills, water conservation and improving the image of the a business/building as a water efficient facility.

Building and Traffic Linkages

The growing motorization and the ever worsening mobility crisis in which personal vehicle usage is marginalizing the public transport, cycling and walking, has added another urgent dimension to impact assessment of buildings in cities. This is especially true for large commercial buildings that induce and attract additional traffic in the neighbourhood. This is already becoming a serious cause of tension.

Traffic impact assessment of buildings will have to be done more rigorously. The expansion in commercial and retail space in cities will induce heavy traffic and will require effective mitigation. The developers will have to be made accountable for improving public transport and non-motorized transport feeders and access to the building complex. They will have to develop and implement a traffic management and mitigation plan that obviates pressure on the neighbourhood, surrounding public spaces and roads.

Some of the basic traffic and parking related issues should be provided by the project proponent, such as;

- Will the proposal create shortage of parking space for vehicles? Furnishing details of the present level, transport infrastructure and measures proposed for improvement including traffic management at the entry and exit to the project site will help;
- Will there be significant increase in traffic noise and vibrations? Give details of the sources and the measures proposed for mitigation of the above.

Therefore, the competent authorities will have to accord priority to this dimension and ensure that buildings obtain consent from the designated authorities in the city and also develop and implement a traffic management plan that obviates pressure on the neighbourhood, surrounding public spaces and roads.

Annexure 2: Biodiversity Assessment

INTRODUCTION

In case a building construction project involves forestland diversion or is coming up in an ecologically sensitive area, biodiversity assessment is a pre-requisite. As a good practice, it is recommended that if a project is likely to cause impacts on local biodiversity, then it is always advisable to conduct an independent assessment depending on scale of projects (see Box: Do all building construction projects require biodiversity assessment), rather than including it in the EIA. However, if anticipated impacts are limited, then a biodiversity management plan may be integrated with common Environmental Management Plan (EMP). While conducting the biodiversity assessment, the first and foremost step is to note the season and the duration of the assessment. If the site is very sensitive, for instance, it falls in animals' migratory corridors, or if any specific bird/bat sites such as nesting, breeding or foraging sites are involved, then one season's data is not sufficient and a comprehensive assessment is required.

Do all building construction projects require biodiversity assessment?

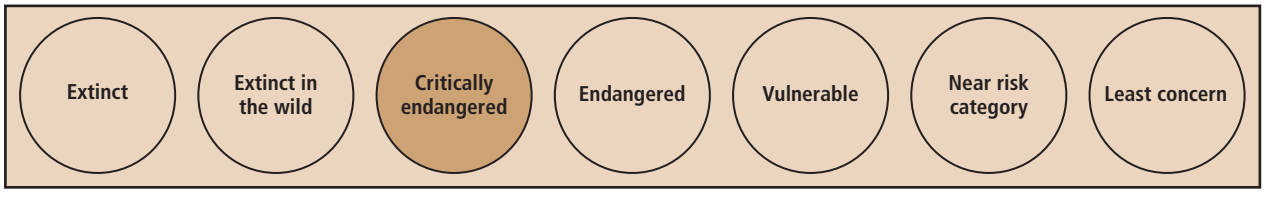
To determine whether a project requires biodiversity assessment or not, the process of screening it is an influential step and plays a crucial role in establishing the requirement for and the extent of biodiversity assessment. If the screening process determines the necessity and extent of an assessment, then the process of scoping lays out the key issues that can be included in the biodiversity assessment. In order to ensure effective scoping, the following activities are a prerequisite — site visit, local stakeholder participation and use of a checklist to identify potential areas of concern. At the scoping stage, there is also a need to develop consensus on a baseline survey requirement, prediction method and evaluation criteria with the involvement of appropriate bodies. It is also important to review the cost and benefits of development project vis-à-vis the richness, sensitivity and importance of biodiversity. If the site is very sensitive and will cause irreversible impacts on biodiversity, which cannot be compensated in any way possible, then a site alternative is the best option.

Risk category assessment

One of the essential components of biodiversity assessment is the identification of the presence of vulnerable, endangered and critically endangered plant and animal species including avian species. The assessment takes place at the project site or in adjoining areas, if either or both are categorized as highest risk category (see Figure 1: Risk category) as assigned by the International Union for Conservation of Nature (IUCN). There are five quantitative criteria normally used to determine whether a taxon is threatened. They are:

- Populations have declined or will decrease, by greater than 80% over the last 10 years or three generations
- A restricted geographical range
- Small population size of less than 250 individuals and continue to decline at 25% in 3 years or one generation
- Very small or restricted population of less than 50 mature individuals. High probability of extinction in the wild

Figure: Risk category



Source - http://moef.nic.in/downloads/public-information/critically_endangered_booklet.pdf

Quick way to assess the potential impact on Biodiversity

While doing biodiversity assessment—the option for 'site alternative' and 'Preventive Approach' is the best method to reduce the impact on biodiversity. There are some methods, which can be very useful to assess the likely impact of project at the conceptualization stage *(see Table 1: Approach to assess the potential impact).*

Table 1: Approach to Assess the Potential Impact at the Initial Stage

Issues	Significance and method of preliminary assessment
Proximity to park/sanctuary/ forest	• Closeness to the project site and high abundance of fauna means high impact is anticipated and thus project proponent must do preliminary site investigation to ensure significance of impact
Encroachment of park/sanctuary/forest	• Decision can be either 'Yes' or 'No' based on species richness, species-specific impact, threat to inhabitants and economic value offered by the forest
Location of the project affects the foraging/ breeding / nesting/migration routes of animals	• Anticipated impact would be high and preliminary flora and fauna assessment is a prerequisite for site feasibility and thus decision can be taken either 'YES' or 'NO' Method—Interaction with forest officials, local villagers and reconnaissance survey
Presence of vulnerable, endangered and critically endangered plant and animals species including avian species at the project site or in adjoining areas	• Anticipated impact would be high and preliminarily assessment is a prerequisite for site feasibility and thus decision can be either 'Yes' or 'No' *Note: Local stakeholders and the forest officials can provide valuable information on species' inventory and provide sound information on environmental and economic importance of species*
Proposed project is close to waterholes or to wetlands or / and fish breeding grounds	• Set back distance should be maintained to reduce impact due to human interference
Proposed project activities would increase siltation that would affect surrounding biodiversity	• Method—By studying the rainfall, site elevation and flow pattern • If runoff originates from the site following the direction of biodiversity area, then the impact would be high
Does the project likely effect the fauna of an area, which has economic/medicinal value?	• Detailed assessment of flora by a taxonomist is the best method. Moreover, local stakeholder input is vital in identifying the medicinal value of plant species

Source – Centre for Science and Environment, 2013

Guiding parameters for effective assessment

There are some key guiding parameters, which need to be carefully examined while dealing with a sensitive project or when project is launched in a park/ sanctuary/forest. These parameters are as follows:

- In case of a very sensitive area, biodiversity assessment must be comprehensive
- Option for a 'site alternative' in case of areas which have a unique habitat or are populated with endemic, threatened or declining species, or species of high economic and cultural value to society or an ecosystem
- Type of forest and area of forestland diverted for non-forest use
- Biodiversity should be assessed on the basis of parameters mentioned below:
  - **Composition:** What biological units are present and how abundant are they?
  - **Structure (or pattern):** How biological units are organized in time and space?
  - **Function:** The role different biological units play in maintaining natural processes and dynamics
  - Number of trees to be cut down with age and name (both scientific and local)
- Details of flora, fauna and avian fauna present in the area, their abundance

and the season in which abundance is high. Also, for fauna assessment the following details should be furnished:

- Types of animals, birds and bird activities across the project and surrounding areas
- Identify animal species listed as threatened or migratory or any specific species coming in a specific season
- Record the location and extent of animals and bird habitat with reference to significance to conservation
- Identification of resident and transient animal and bird species
- Animals and birds utilization status—determine all the species present across different seasons and how they utilise the site

Review of mitigation plan for biodiversity

While preparing a biodiversity conservation plan, the focus should be on safeguarding biodiversity and the ecosystem as far as practicable. As a general rule, if impacts are irreversible and cannot be compensated by any means, it is better to avoid the site. If impacts are manageable, then minimize the impacts by creating a Biodiversity Action Plan (BAP). Similarly, Conservation Plans incorporate Species Action Plans (SAPs) where the mitigation is targeted for the protection of a specific species and Habitat Action Plans (HAPs), which aim at protection of habitats of rare, critically endangered, endangered and vulnerable species. Some key components that must be provided for reviewing the conservation plan include financial requirements for conservation, responsible authorities and monitoring schedule.

Annexure 3: National Standards applicable for Building Construction Project

Various Standards applicable on building construction projects in mainland Tanzania are as follows:

WATER QUALITY STANDARDS

Table 1: Permissible Limits for Municipal and Industrial Effluents—Physical Components

Parameter	Limit	Test Method
BOD5 at 20 °C	30 mg/l	TZS 861(Part 3):2006—Five-day BOD Method
COD	60 mg/l	TZS 861(Part 4):2006 – Dichromate Digestion Method
Colour	300 TCU	ISO 7887: 1994, Water quality—Examination and determination of colour—Section 3: Determination of true colour using optical instruments
pH range	6.5-8.5	TZS 861(Part 2):2006—Electrometric Method
Temperature range	20-35 °C	
Total Suspended Solids (TSS)	100 mg/l	TZS 861(Part 1):2006—Gravimetric Method
Turbidity	300 NTU	APHA Standard Methods:2130 B. Nephelometric Method

Source: The Environmental Management (Water Quality Standards) Regulations, 2007

Table 2: Permissible Limits for Municipal and Industrial Effluents—Inorganic Components

Parameter	Limit (mg/l)	Test Method
Aluminium (as Al)	2.0	TZS 861(Part 7):2006—Direct Nitrous Oxide-Acetylene Flame Atomic Absorption Spectrometry
Arsenic (As)	0.2	TZS 861(Part 8):2006—Manual hydride Generation- Atomic Absorption Spectrometry
Barium (Ba)	1.5	TZS 861(Part 7):2006—Direct Nitrous Oxide-Acetylene Flame Atomic Absorption Spectrometry
Cadmium (Cd)	0.1	TZS 861(Part 7):2006—Flame Atomic Absorption Spectrometry
Chromium (total)	1.0	TZS 861(Part 7):2006—Flame Atomic Absorption Spectrometry
Chromium VI	0.1	TZS 861(Part 9):2006 —Colorimetric Method
Chlorides (Cl-)	200	APHA Standard Methods: 4110 B. Ion Chromatography with Chemical Suppression of Eluant Conductivity
Cobalt (Co)	1.0	TZS 861(Part 7):2006—Flame Atomic Absorption Spectrometry
Copper (Cu)	2.0	TZS 861(Part 7):2006—Flame Atomic Absorption Spectrometry
Fluorides (F-)	8	APHA Standard Methods: 4110 B. Ion Chromatography with Chemical Suppression of Eluant Conductivity
Iron (Fe)	5.0	TZS 861(Part 7):2006—Flame Atomic Absorption Spectrometry
Lead (Pb)	0.1	TZS 861(Part 7):2006—Flame Atomic Absorption Spectrometry
Manganese	5.0	TZS 861(Part 7):2006 —Flame Atomic Absorption Spectrometry
Mercury (Hg)	0.005	TZS 861(Part 10):2006—Cold-Vapor Atomic Absorption Spectrometry
Nickel (Ni)	0.5	TZS 861(Part 7):2006Flame Atomic Absorption Spectrometry
Nitrates (NO3 -)	20	APHA Standard Methods: 4110 B. Ion Chromatography with Chemical Suppression of Eluant Conductivity
Phosphorus Total (as P)	6	TZS 861(Part 6):2006—ColorimetricAscorbic Acid Method
Selenium (Se)	1.0	TZS 861(Part 8):2006Manual hydride Generation- Atomic Absorption Spectrometry
Silver (Ag)	0.1	ISO 15586: 2003, Water quality—Determination of trace elements using atomic absorption spectrometer with graphite furnace

Sulphate (SO_4^{2-})	500	APHA Standard Methods: 4110 B. Ion Chromatography with Chemical Suppression of Eluant Conductivity
Sulphides (S^-)	1	APHA Standard Methods: 4110 B. Ion Chromatography with Chemical Suppression of Eluant Conductivity
Tin (Sn)	2.0	TZS 861(Part 7):2006—Flame Atomic Absorption Spectrometry
Total Kjeldahl Nitrogen (as N)	15	TZS 861(Part 5):2006—Kjeldahl Method
Vanadium	1.0	ISO 15586: 2003, Water quality—Determination of trace elements using atomic absorption spectrometer with graphite furnace
Zinc (Zn)	5.0	TZS 861(Part 7):2006Flame Atomic Absorption Spectrometry

Source: The Environmental Management (Water Quality Standards) Regulations, 2007

Table 3: Permissible Limits for Municipal and Industrial Effluents—Organic Components

Parameter	Limit	Test Method
1, 1, 2 -Trichloroethane	0.06	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)
1,1,1 - Trichloroethane	3.0	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons – Gas chromatographic methods.)
1,2 - Dichloroethylene	0.2	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)
1,2 - Dichloroethane	0.04	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)
1,3 - Dichloropropene	0.2	GC ECD (ISO 10301: 1997, Water quality— Determination of highly volatile halogenated hydrocarbons — Gas chromatographic methods.)
Alkyl benzene sulfonate (ABS)	0.5	ISO 7875 – 1: 1996, Determination of surfactants—Pat 1: Determination of anionic surfactants by measurement of the methylene blue index (MBAS)
Aromatic nitrogen containing compounds (e.g., aromatic amines)	0.001	APHA Standard Methods 6410: Liquidliquid extraction GC/MS method
cis-1, 2 - Dichloroethylene	0.4	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)
Dichloromethane	0.2	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)
Oil and Grease (fatty maters and hydrocarbons)	10	APHA Standard methods 5520
Organochlorine pesticides (Cl)	0.0005	GC ECD (ISO 6468: 1996, Water quality—Determination of certain organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes—Gas Chromatographic method after Liquid-Liquid extraction)
Other aromatic and/or aliphatic hydrocarbons not used as pesticides	0.05	GC ECD (ISO 6468: 1996, Water quality—Determination of certain organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes—Gas Chromatographic method after Liquid-Liquid extraction)
Pesticides other than organochlorines	0.01	GC ECD (ISO 6468: 1996, Water quality—Determination of certain organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes—Gas Chromatographic method after Liquid-Liquid extraction)
Phenols	0.002	GC ECD (ISO 6468: 1996, Water quality—Determination of certain organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes—Gas Chromatographic method after Liquid-Liquid extraction
Tetrachloroethylene	0.1	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)
Tetrachloromethane	0.02	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)
Trichloroethylene	0.3	GC ECD (ISO 10301: 1997, Water quality—Determination of highly volatile halogenated hydrocarbons—Gas chromatographic methods.)

Source: The Environmental Management (Water Quality Standards) Regulations, 2007

Table 4: Permissible Limits for Municipal and Industrial Effluents—Microbiological Components

Parameter	Limit	Test Method
Total Coliform Organisms	10,000counts /100mL	ISO 6222:1999, Microbiological methods

Table 5: Microbiological Requirements and Classification of Non-Chlorinated Piped Water Supplies

Class of piped Water/Type of test count	Coliform count per 100 ml at 37°C	E. Coli (faecal coliform) count per 100 ml at 44°C
Excellent	0	0
Satisfactory	1 - 3	0
Suspicious	4 -10	0
Unsatisfactory	More than 1 0	1 or more
Note: For each individual sample coliform should be estimated in terms of the 'Most Probable Number' in 100 ml of drinking water, which is often designated as MPN index or Coli index. Occurrence of E. coli (faecal coli) in consecutive samples, in less than 100 ml of drinking water is an indication of faecal pollution and hence a dangerous situation needing urgent, rectification.		

Source: The Environmental Management (Water Quality Standards) Regulations, 2007

Table 6: Six Chemical and Physical Limits for Quality of Drinking Water Supplies

Group	No. Substance	Unit	Lower limit	Upper Limit
Toxic	Lead (Pb)	mg/L	-	0.1
	Arsenic (As)	mg/L	-	0.05
	Selenium (Se)	mg/L	-	0.05
	Chromium (6+) (Cr)	mg/L	-	0.05
Cyanide (CN) mg/L			-	0.20
	Cadmium (Cd)	mg/L	-	0.05
	Barium (Ba)	mg/L	-	1.0
	Mercury (Hg)	mg/L	-	0.001
	Silver (Ag)	mg/L	-	n.m
Affecting Human Health	Fluoride (F)	mg/L	1.5	4.0
	Nitrate ($N0_3$)	mg/L	10.0	75.0
Organoleptic	Colour	TCU	1.5	50
	Turbidity	NTU	5	25
	Taste	-	n.o	-
	Odour	-	n.o	-
Salinity and Hardness	pH		6.5	9.2
	Total Filterable Residue	mg/L	500	2000
	Total Hardness ($CaC0_3$)	mg/L	500	600
	Calcium Ca	mg/L	75	300
	Magnesium Mg	mg/L	50	100
	Magnesium + Sodium $S0_4$	mg/L	500	1000
	Sulphate $S0_4$	mg/L	200	600
	Chloride CI	mg/L	200	800

Less Toxic Metals	Iron Fe	mg/L	0.3	1.0
	Manganese Mn	mg/L	0.1	0.5
	Copper Cu	mg/L	1.0	3.0
	Zinc Zn	mg/L	5.0	15.0
Organic Pollution of Natural Origin	BOD (5 days at 30°C)	mg/L	6.0	6.0
	PV (Oxygen abs KMN04)	mg/L	10	20
	Ammonium, (NH_3^+ , NH_4^+)	mg/L	2.0	2.0
	Total Nitrogen (Excluding $N0_3$)	mg/L	1.0	1.0
Organic Pollution Introduced Artificially	Surfactants (Alkyl Benzyl Sulphonates)		1.0	2.0
	Organic Matter (as carbon in Chloroform extract)		0.5	0.5
	Phenolic Substances (As Phenol)		0.002	0.002
Note: 1. n.o - not objectionable 2. n.m - not mentioned				

Source: The Environmental Management (Water Quality Standards) Regulations, 2007

Table 7: Distance to Source of Contamination

Source of contamination	Minimum distance from source
Pit preview, septic tanks and sewers.	50 metres
Borehole latrines, seeping pits, trenches and sub surface sewage disposal fields.	100 metres
Cesspools, sanitary landfill areas and graves.	150 metres

Source: The Environmental Management (Water Quality Standards) Regulations, 2007

AIR QUALITY STANDARDS

Table 8: Permissible Weight Concentration (Emission Limits) from the Atmosphere to a Receptor and Respective Test Methods

Pollutant	Guidelines	Limit Level
Sulphur oxides, SO_x	Annual mean of 40 – 60 µg/Nm^3 (0.05 – 0.08 mg/kg) or 24 – hour average 100 µg/Nm^3 (0.129 mg/kg)	Daily average of hourly values shall not exceed 0.1 mg/kg 0.5 mg/Nm^3 for 10 minutes
Carbon monoxide, CO	Aims at preventing carboxyhaemoglobin levels exceeding 2.5- 3% in non-smoking people.	1. A maximum permitted exposure of 100mg/Nm^3 for periods not exceeding 15 minutes. 2. Time-weighed exposures at the following levels: • 100 mg/Nm3 for 15 minutes • 60 mg/Nm3 for 30 minutes; • 30 mg/Nm3 for 60 minutes • 10 mg/Nm^3 for 8 hours. or Daily average of hourly values shall not exceed 10mg/kg and average of hourly values in eight consecutive hours shall not exceed 20 mg/kg.
Black smoke and suspended particulate matters (PM 10)	Black smoke 40 to 60 µg/Nm^3 (0.05-0.08 mg/kg) PM 10 60 to 90 µg/Nm^3 (0.05 – 0.116 mg/kg)	Daily average of hourly values shall not exceed 0.10 µg/Nm^3 and hourly values shall not exceed 0.20 µg/Nm^3
Nitrogen dioxide. NOx	Annual mean of 0.1 µg/Nm^3	150 µg/Nm^3 for 24-hours average value 120µg/Nm3 for 8 hours
Lead	Annual mean of 0.5 – 1.0 µg/Nm^3	1.5µg/Nm^3 for 24 hours average value
Ozone	Annual mean of 10 – 100 µg/Nm^3	120 µg/Nm^3 for 8 hour average value

Source: The Environmental Management (Air Quality Standards) Regulations, 2007

Table 9: Emission Limits for Motor Vehicles

Emission Limits for Heavy Duty (HD) Diesel Engines *Note: Limits shall be determined by methods conforming to TZS 985/ISO 3929 and/or analyzers conforming of TZS 986/ISO 3930*	
Pollutant	**Limit**
CO	4.5 g/kWh
NOx	1.1 g/kWh
HC	8.0 g/kWh
PM	0.612 g/kWh
Smoke	0.15 g/m

Source: The Environmental Management (Air Quality Standards) Regulations, 2007

NOISE AND VIBRATION STANDARDS

Table 10: Maximum Permissible Noise Levels for General Environment

COLUMN 1	COLUMN 2	
FACILITY	**NOISE LIMITS Dba (Leq)**	
	Day	**Night**
A. Any building used as hospital, convalescence home, home for the aged, sanatorium and institutes of higher learning, conference rooms, public library, environmental or recreational sites.	45	35
B. Residential building	50	35
C. Mixed residential (with some commercial and entertainment)	55	45
D. Residential and industry small-scale production and commerce	60	50
E. Industrial area	70	60

Source: The Environmental Management (Noise and Vibration Control) Regulations, 2007

Time Frame: Use duration
Day – 6.00 am – 10.00 pm
Night – 10.00 pm – 6.00 am
Time frame takes into consideration human activity.

Table 11: Maximum Permissible Noise Levels for Construction Site

COLUMN 1	COLUMN 2	
Facility	**Maximum noise level permitted (Leq) in dBA**	
	Day	Night
(i) Hospital, Schools, Institutions of higher learning, homes for the disabled, etc	60	50
(ii) Building other than those prescribed in (i) above	75	65

Source: The Environmental Management (Noise and Vibration Control) Regulations, 2007

Table 12: Maximum Permissible Noise Levels for Public Announcement System or Device

COLUMN 1	COLUMN 2	
Noise Control Zone	**Sound Level dB A (Leq) Day**	**Sound Level dB A (Leq) Night**
Residential	60	40
Commercial	75	50
Industrial	85	65

Source: The Environmental Management (Noise and Vibration Control) Regulations, 2007

Time Frame: Use duration
Day – 6.00 am – 10.00 pm
Night – 10.00 pm – 6.00 am
Time frame takes into consideration human activity.

Table 13: Maximum Permissible Noise Levels for Places or Establishments of Entertainment

COLUMN 1	COLUMN 2	
Noise Control Zone	Sound Level dB A (Leq) Day	Sound Level dB A (Leq) Night
Residential	60	40
Commercial	75	50
Industrial	85	65

Source: The Environmental Management (Noise and Vibration Control) Regulations, 2007

Time Frame: Use duration
Day – 6.00 am – 10.00 pm
Night – 10.00 pm – 6.00 am
Time frame takes into consideration human activity.

Table 14: Maximum Permissible Noise Levels for Places Areas of Worship

COLUMN 1	COLUMN 2	
Noise Control Zone	Sound Level dB A (Leq) Day	Sound Level dB A (Leq) Night
Residential	60	40
Commercial	75	50
Industrial	85	65

Source: The Environmental Management (Noise and Vibration Control) Regulations, 2007

Time Frame: Use duration
Day – 6.00 am – 10.00 pm
Night – 10.00 pm – 6.00 am
Time frame takes into consideration human activity.

Table 15: Maximum Permissible Noise Levels for Vehicles

	Column 1	Column 2
	Vehicle Category	Maximum sound level in dBA
1	Vehicle intended for carriage of passengers and equipped with not more than nine seats, including the driver's seat	78
2	Vehicle intended for carriage of passengers and equipped with not more than nine seats, including the driver's seat and having maximum permissible mass of more than 3.5 tones (a) – with an engine power of more than 150KW (b) – with an engine power of less than 150 KW	 80 83
3.	Vehicle intended for carriage of passengers and equipped with not more than nine seats including the driver's seat: Vehicles intended for carriage of goods: (a) – with a maximum permissible mass not exceeding 2 tonnes (b) – with a maximum permissible mass exceeding 3.5 tonnes	 79 80
4	Vehicle intended for carriage of goods and having a maximum permissible mass exceeding 3.5 tonnes (a) – with an engine power of less than 75 KW (b) – with an engine power of not less than 75KW but less than 150 KW (c) – with an engine power of not less than 150 KW	 81 83 84

Source: The Environmental Management (Noise and Vibration Control) Regulations, 2007

URBAN PLANNING AND SPACE STANDARDS

Space and Planning Standards for Residential Area:-

Table 16: Detached house and Maisonettes

	Type	Plot Size in per-urban area	Max. No. of household	Max. No. of Buildings	Max. Plot coverage %	Max. Plot ratio	Max. No. of storey	Minimum Setbacks in Metres		
								front	sides	rear
i	Special area and unplanned settlements (Special case)	90 – 300	1	1	80	2.5	4-6	5	1.5	3
ii	High density	301 – 600m^2	1	2	60	2.0	4-6	5	1.5	3
iii	Medium density	601 – 800m^2	1	2	55	1.5	4-6	7	2	4
iv	Low density	801 – 1200m^2	1	2	50	1.0	4-6	10	2.5	5
v	Super Low density	1201 – 2000m^2	1	2	45	0.7	4-6	12	3	5.5

Source: The Urban Planning and Space Standards Regulations, 2018

Table 17: Duplex, Terrace/Row houses, Apartment Blocks / Block of Flats / Real Estate, Gated Communities

	Type	Plot Size in peri-urban area	Max. No. of household	Max. No. of Building	Max. Plot coverage %	Max. Plot ratio	Max. No. of storeys	Minimum setbacks in metre		
								front	sides	rear
i	Duplex	2001 – 4000m^2	14	4	60	0.8	2	15	5	10
ii	Terrace/Row houses	4001 – 8000m^2	30	3	55	1.0	2	20	5	10
iii	Apartment Blocks / Block of Flats /Real Estate	8001 – 12000m^2	50	5	50	2.5	5	20	5	10
iv	Gated Comm-unities/ Conser-vation Reside-ntial areas	12001 – 20,000m^2	150	10	45	3	2	25	10	15

Source: The Urban Planning and Space Standards Regulations, 2018

Table 18: Minimum Planning and Space Standards for Health Facilities

	Type	Plot Size	Max. No. of Buildings	Max.Plot coverage %	Max. Plot ratio	Max. No. of storeys	Setbacks in Metres		
							front	sides	rear
i	Dispensary/ clinic	1000 – 5000m^2	-	60	1.5	3	10	3	5
ii	Health centre/ MCH	0· 5 – 1ha	-	55	2.2	4	15	3	5
iii	Hospital	2·5 – 10ha	-	55	2.5	5	15	3.5	5
v	District Hospital	5 – 10ha	-	45	-	5	20	7	10
vi	Regional Hospital	5 – 10ha	-	45	-	5	20	5	7
vii	Referral Hospital	10 – 40ha	-	40	2	5	25	7	7

Source: The Urban Planning and Space Standards Regulations, 2018

Table 19: Minimum Planning and Space Standards for Education Facilities

	Type	Plot Size	Max. No. of Buildings	Max. Plot coverage %	Max. Plot ratio	Max. No. of storeys	Setbacks in Metres		
							Front	Sides	Rear
i	Nursery School/Kindergarten day care Centre	1200 – 1800m^2	3	50	0.5	1	10	3	5
ii	Primary School	1·50 – 4·5 ha	-	40	1.5	3	15	5	10
iii	Secondary School	2·5 – 5·0 ha	-	40	2	5	15	5	10
v	Polytechnic	3·0 – 5·0 ha	-	40	2	5	15	5	10
vi	Education Centre	1·2 – 2·5 ha	-	50	2.5	5	20	5	7
vii	Colleges /University College	5.0 – 10·0 ha	-	50	5	10	20	10	10
viii	University	10·0 – 40·0 ha	-	50	5	10	25	10	20

Source: The Urban Planning and Space Standards Regulations, 2018

Table 20: Minimum Planning and Space Standards for Recreational Facilities

S/No.	Type of facility	Planning Level	Population /Unit	Gross area/Person M^2	Plot size
I	Open Spaces	Housing Cluster/Neighborhood	100 – 150	5.0 – 10.0	500 – 1500 M^2
ii	Neighbourhood Park	Neighbourhood	3,000 – 5,000	2.0 – 5.0	0.6 – 2.5 ha
iii	Community Park	Community	10,000 – 20,000	1.5 – 2.5	2.5 – 4.0 ha
iv	Recreation Park (Amusement)	District/town	10,000 – 100,000	1.0 – 2.0	10 – 20 ha
v	Central Park	City/Municipal	100,000 – 1,000,000	1.0 – 2.0	

Source: The Urban Planning and Space Standards Regulations, 2018

Table 21: Minimum Planning and Space Standards for Golf Course

S/No.	Course Type	Population nit	Parking Lots (cars)	Length (M)	Plot size (Ha)
i	9 holes	5,000 – 25,000	100	750	50.0
ii	9 holes per 3 course	5,000 – 25,000	100	750	50.0
iii	18 holes	25,000 – 50,000	200	2,170	50.0

Source: The Urban Planning and Space Standards Regulations, 2018

Table 22: Minimum Planning and Space Standards for Active Recreation

S.No.	Type of facility	Gross area/1000 Persons (Ha)	Neighborhood Level (Ha)	Community Level (Ha)	District Level (Ha)
i	Children play area	0.2 – 0.4	1.0 – 1.5	4.0 – 8.0	5 – 10
ii	Play fields	0.5 – 1.0	2.5 – 5.0	10.0 – – 20.0	10 – 50
iii	Sport Fields and Stadia	1.0 – 1.5	5.0 – 8.0	20.0 – 30.0	50 – 100

Source: The Urban Planning and Space Standards Regulations, 2018

Table 23: Minimum Planning and Space Standards for Passive Recreation

S.No.	Type of Activity	Gross area/1000 Persons (Ha)	Neighborhood Level (Ha)	Community Level (Ha)	District Level (Ha)
i	Picnicking	250 – 500 M^2	1.0 – 2.0 ha	5.0 – 10.0	10 – 15
ii	Zoo or Arboretum	0.5 – 1.0 ha	2.5 – 5.0 ha	10.0 – 15.0	50 – 100
iii	Camping	1.0 – 5.0 ha	10.0 – 25.0 ha	40.5 – 100.0	100 – 150

Source: The Urban Planning and Space Standards Regulations, 2018

Table 24: Minimum Planning and Space Standards for Public facilities by population size

Type	Cross area/person	Population size	
Hotel site	0.2m^2	100,000	2.4 ha.
Commercial zone/Shopping mall	0.3m^2	100,000	3.6 ha.
Bar/Restaurant	0.4m^2	3,000 +	3.6 ha.
Cinema hall	0.3 – 10m^2	400 – 800 seats	4000 – 8000m^2
Lodge/Guest house			800m^2

Source: The Urban Planning and Space Standards Regulations, 2018

Table 25: Minimum Planning and Space Standards for Service Trade and Industries

S/No.	Type	Plot Size	Max. No. of Buildi-ngs	Max. Plot covera-ge %	Max. Plot ratio	Max. No. of storeys	Setbacks in Metres		
							ront	Sides	Rear
i	Informal trade	2,000 – 80,000m^2	-	60	1.2	2	15	5	5
ii	Small Scale /service Industries	1,200 – 50,000m^2	-	60	1.2	2	15	3	5
iii	Medium/light/ heavy Industrial plot	80,000m^2	-	60	1.2	2	15	3	5
v	Warehouse/Godown	80,000m^2	-	50	1	2	15	5	7
vi	Show rooms/yards	40,000m^2	-	60	3	5	15	5	7
vii	Filling Station	400 – 1,200m^2	3	60	1	2	10	5	5
viii	Petrol and Service Station	2501 – 4000m^2	3	50	1.5	2	10	5	5
ix	Fire Station	2000 – 3000m^2	3	50	1.5	2	10	5	5

Source: The Urban Planning and Space Standards Regulations, 2018

(i) Minimum distance between Petrol stations/Filling stations along the same side of roads shall be at least 200m.

(ii) Minimum distance between Petrol stations/Filling stations on opposite side of a roads shall be the right of way of the particular road.

(iii) Minimum distance between Petrol stations/Filling stations in highly concentrated unplanned residential areas shall be at least 500m.

(iv) Plots for Petrol stations/Filling stations must be fenced with a strong concrete wall of a height of three meters.

Table 26: Minimum Planning and Space Standards for Parking — Parking Requirements

Type of car	Angle of parking	Area
Buses and coaches	-	40 – 50m^2
Car parking	a) in line parking	25 – 30m^2
	b) in 45 degrees	20 – 30m^2
	c) in 90 degrees	20 – 25m^2
Lorry parking	a) in 90 degrees	90 – 120m^2
	b) in 45 degrees	135 – 145m^2

Source: The Urban Planning and Space Standards Regulations, 2018

Table 27: Minimum Planning and Space Standards for Parking – Parking Lots

Land use	Parking Ratio
Housing estate	2 per housing unit
Offices	5/500m^2 of total gross floor area
Commercial	5/1000m^2 of total gross floor area
Hospital	10/50 beds
Hotel	10/50 beds
Airport Hotel	5/50 beds

Source: The Urban Planning and Space Standards Regulations, 2018

Table 28: Minimum Planning and Space Standards for Parking – Special Parking Requirements

S/No.	Level of provision	Area required (ha)
i	District Head Quarter	50.0
ii	Regional headquarter	100.0
iii	Commercial City	300.0

Source: The Urban Planning and Space Standards Regulations, 2018

Table 29: Minimum Planning and Space Standards for Electric Supply Substations

SN	Type of electric supply lines in Kilowatts	Plot size (m)
i	33KV/11KV	30 x 40
ii	132KV/3KV	50 x 80
iii	220KV/132KV	100 x 100
iv	400KV/220KV	200 x 200

Source: The Urban Planning and Space Standards Regulations, 2018

Table 30: Planning and Space Standards for Public Utility Way leaves – Electricity Supply

S/No.	Types of electric supply lines in Kilowatts (KV)	Right of way in meters (ROW)	Distance from Centre line
i	11	5.0	2.5
ii	33	10.0	5.0
iii	66	20.0	10.0
iv	132	40.0	20.0
v	220	60.0	30.0
vi	400	60.0	30.0

Source: The Urban Planning and Space Standards Regulations, 2018

Table 31: Planning and Space Standards for Public Utility Way leaves - Water Supply

S/N	Type of water supply pipe	Right of Way in metres (ROW)	Distance from Centre Line in metres(CN)
i.	Trunk mains (main pipe)	15.0	7.5
ii.	Distributors	2.0	1.0
iii.	Fire Hydrants	2 km. apart	-

Source: The Urban Planning and Space Standards Regulations, 2018

Table 32: Planning and Space Standards for Public Utility Way leaves - Gas /Oil Supply

S/No.	Type of gas/oil pipe	Right of Way in metres (ROW)	Distance from Centre line in metres(CN)
i.	Main pipe	60	30
ii	Main Distributors	30.0	15.0
iii	Minor Distributor	15	7.5
iii.	Distributors	2.0	1.0

Source: The Urban Planning and Space Standards Regulations, 2018

Table 33: Planning and Space Standards for Public Utility Way leaves – Space Standards for Carriageways and Right of Ways

Type	Right of Way (metre)	Carriageway (metre)
Trunk road	80 – 120	8 – 12
Primary distributors	60 – 80	6 – 8
District distributors	30 – 60	6 – 7
Local distributors	20 – 30	5 – 6
Access Road in Residential area	15.0 – 20.0	4 – 6
Access Road in Industrial area	15 – 20	4 – 6
Access roads in shopping streets	15 – 20	10.0
Cul-de-sac.	10.0	5
Rural roads	20 – 25	7.5 – 10
Highways within urban areas	45	6 – 7
Pedestrian access	5	2

Source: The Urban Planning and Space Standards Regulations, 2018

Table 34: Planning and Space Standards for Public Utility Way leaves - Roads within Unplanned Settlements

Type	Right of Way (metres)	Carriageway (metres)
Primary Access	12 – 15	5.0 – 7.5
Secondary access	10 – 12	5.0 - 6
Tertiary access (one way)	4 – 8	2 – 3
Footpath	2 – 4	2

Source: The Urban Planning and Space Standards Regulations, 2018

Table 35: Planning and Space Standards for Public Utility Way leaves - Railway

S/N	Type of railway truck	Right of Way in metres (ROW)	Distance from Centre Line in metres(CN)
i.	Trams and metro	20.0	10.0
ii.	Regional trains (Double truck line)	50 – 60	25 – 30

Source: The Urban Planning and Space Standards Regulations, 2018

Table 36: Planning and Space Standards - Airport Sizes

S/No.	Type of Airport	Area in Hectares
i	International Airport	400.00
ii	Regional Airport	150.00
iii	District Airport	100.00
iv	Air strip/landing ground	60.00

Source: The Urban Planning and Space Standards Regulations, 2018

Table 37: Planning and Space Standards Size - Railway Stations

S/No.	Type of Railway Station	Area in Hectares
I	Regional	100.00
ii	District	75.00
iii	Local	50.00

Source: The Urban Planning and Space Standards Regulations, 2018

Annexure 4: The Environmental Management (Fees and Charges) Regulations, 2021

(Note – The given fee structure is subject to change by amendment of the regulation)

Table 1: Fees Charges for Environmental Impact Assessment

S/No.	Description	Amount TShs
1.	Application for EIA	50,000
2.	Submission of Project Brief / Scoping Report	150,000
3.	Duplicate EIA Certificate	300,000
4.	Transfer of Certificate	300,000
5.	Surrender of Certificate	300,000
6.	Variation of Certificates	150,000

Table 2: Fees for Accessing EIA Information

S/N.	Description	(Amount TShs) Inspection and Reading	Extraction
1	EIA Project Brief	10,000	15,000
2	Environmental Impact Statement (EIS)	15,000	30,000
3	Environmental Audit Report	15,000	30,000
4	Approvals	10,000	15,000
5	Certificates	10,000	15,000
6	Monitoring Reports	10,000	15,000

Table 3: Fees and Charges for Review of Environmental Impact Assessment and Audit Project Type [EIA fees will be valid within the financial year]

S/No.	CATEGORY	Extractive Industries	Other Type A Projects
	Type A Projects		
1.	Project Costs below TZS 1 Billion	TZS 5 Million	TZS 4 Million
2.	Project Costs ranging between TZS 1 to 4.99 Billion	TZS 8 Million	TZS 6 Million
3.	Project Costs ranging between TZS 5 to 9.99 Billion	TZS 8.5 Million	TZS 6.5 Million
4.	Project Costs ranging between TZS 10 to 49.99 Billion	TZS 20 Million	TZS 15 Million
5.	Project Costs ranging between TZS 50 to 499.99 Billion	TZS 50 Million	TZS 30 Million
6.	Project Costs of TZS 500 Billion and above	TZS 100 Million	TZS 70 Million
	Type B Projects		
7.	Project cost of below TZS 50 Million	TZS 2 Million	
8.	Project cost of ranging between TZS 50 Million to 99.99 Million	TZS 3 Million	
9.	Project Costs above TZS 100 Million	TZS 4 Million	
10.	Government Financed project serving communities : Infrastructure, health, water, education facilities, and pro-conservation projects	0.05% of total project costs to a minimum of TZS 5 Million but not exceeding TZS 50 Million	

Table 4: Environmental Experts Registration Fees

Description	Amount TZSs			
	Individual		Firm	
	Local TZS	Foreign TZS	Local TZS	Foreign TZS
Application for Registration	100,000	450,000	500,000	1,000,000
Practicing Certificate	200,000	900,000	1,000,000	1,500,000
Renewal of Practicing Certificate	200,000	1,260,000	500,000	2,500,000

Table 5: Annual Charges for Environmental Monitoring and Audit

Category	Facility or Undertaking	Amount TZS	
		Non-Irrigation scheme	Irrigation scheme
Agriculture and agro-processing industries	Cultivation a) 100 – 249 acres b) 250 – 449 acres c) 500 – 999 acres d) For every acre above 999 acres	250,000 500,000 750,000 250	500,000 1,000,000 1,500,000 350
	Floriculture and horticulture a) Up to 5 acres b) 6 – 10 acres c) 10 – 20 acres d) For every acre above 20 acres	500,000 750,000 1,5000,000 5,000	
	Biological pest control	100,000	
	New breeds of crops (trial farms)	500,000	
	Genetically Modified Organisms (GMOs)	2,500,000	
	Sisal processing	1,000,000	
	Tea and Coffee processing a) Wood fuel b) Non Wood fuel	3,000,000 1,500,000	
	Tea and Coffee packaging	500,000	
	Tobacco Processing a) Wood fuel b) Non Wood fuel	5,000,000 3,000,000	
	Cotton Processing (Ginneries)	750,000	
	Cashew nut processing	1,500,000	
	Sugar factories	1,500,000	
Tourism or recreational development	Tourism or Recreational development facility within and adjacent to protected and sensitive areas a) Three to five stars b) One or two star c) Others (ungraded)	2,000,000 1,000,000 750,000	
	Tourism or Recreational development facility located outside protected and sensitive areas a) Three to five stars b) One or two star c) Others (ungraded)	1,500,000 750,000 150,000	
	Mountain cable cars and balloon operations	750,000	
	Sporting facilities (stadium, playground)	750,000	
	Social halls and night clubs	300,000	

Category	Facility or Undertaking	Amount TZS
Building and civil engineering industries	Housing estate	1,000,000
	Multi-storey building a) Residential (per floor) b) Commercial (per floor)	 30,000 50,000
	Motor terminals	300,000
	Shopping mall	1,000,000
	Warehouse and storage facility	300,000
	Supermarket outside shopping mall	300,000
	Open market in cities/ municipalities	300,000
	Cement block making plant	1,000,000
	Artisanal block/ brick making	100,000
	Custom bonded warehouse	300,000
	Car/ vehicle showroom	200,000
	Concrete poles production	1,000,000
Health care facilities	Hospital	300,000
	Health centers	150,000

Annexure 5: Project Screening Criteria

The following shall be screening criteria to be used:

1. The project will not substantially use natural resources in a way that pre-empts the use or potential use of that resource for any other purpose.

2. Potential residual impacts on the environment are likely to be minor, of little significance and easily mitigated.

3. The type of project, its environmental impacts and measures for managing them are well understood in Tanzania.

4. Reliable means exist for ensuring that impact management measures can and will be adequately planned and implemented.

5. The project will not displace significant numbers of people, families or communities.

6. The project is not located in, and will not affect, any environmentally sensitive areas such as:
   (a) national parks;
   (b) wetlands;
   (c) productive agricultural land;
   (d) important archaeological, historical and cultural sites;
   (e) areas protected under any law;
   (f) areas containing rare or endangered flora or fauna;
   (g) areas containing unique or outstanding scenery;
   (h) mountains or developments on or near steep hill-slopes;
   (i) dry tropical forests, for instance brachystegia woodlands;
   (j) development near lakes or its beaches;
   (k) development providing important resources for vulnerable groups such as fishing communities along the lake-shore;
   (l) development near high population concentrations or industrial activities where further development could create significant environmental problems; and
   (m) prime ground-water re-charge areas or areas of importance for surface run off of water.

7. The project type shall not result in:
   (a) policy initiatives which may affect the environment such as changes in agricultural pricing subsidies or the tobacco liberation;
   (b) major changes in land tenure; or
   (c) changes in water use though irrigation, drainage promotion or dams, changes in fishing practices.

8. The project shall not cause:
   (a) adverse socio economic impact;
   (b) land degradation;
   (c) water pollution;
   (d) air pollution;
   (e) damage to wildlife and habitat;
   (f) adverse impact on climate and hydrological cycle; and

(g) creation of by-products, residual or waste materials which require handling and disposal in a manner that is not regulated by existing authorities.

9. The project shall not cause significant public concern because of potential environmental changes. The following are guiding principles:
   (a) Is the impact positive, mainly benign or harmful?
   (b) What is the scale of the impact in terms of area affected numbers of people or wildlife?
   (c) What is the intensity of the impact?
   (d) What will be the duration of the impact?
   (e) Will there be cumulative effects from the impact?
   (f) Are the effects politically controversial?
   (g) Have the main economic, ecological and social costs been quantified?
   (h) Will the impact vary by social group or gender; and
   (i) Is there any international impact due to the proposal projects?
10. The project shall not necessitate further development which is likely to have a significant impact on the environment.

Source: The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018

Annexure 6: Good Practices in the Sector

Building construction sector are not like extractive industries, the potential impacts are envisaged depending on scale and location sensitivity. In order to minimize the impacts of building construction projects on the environment and people, different countries have developed their own standards and guidelines, details of which are summarized below and can be used wherever applicable.

6.1 Resettlement and Rehabilitation

- If displacement and resettlement are applicable, it should ensure that the dignity, human and civil rights, livelihoods, cultures and social networks of affected people are upheld. These should be taken into consideration when conducting the EIA or formulating social and economic safeguards. To do this satisfactorily, the proponent should engage or facilitate engagement of all stakeholders in prior, free and informed consultations
- Preparation of a Social Management Plan (SMP) if displacement or loss of livelihood is involved. The plan should include details of the compensation provided
- The proponent should also ensure basic amenities including housing, educational facilities, infrastructure and alternative livelihood potential at the settlement colony. The Social Management Plan must clearly provide budgets, timeline for implementation; responsibility; and grievance redressal

6.2 Land

- Disturbing the existing vegetation and natural contour of the land as little as possible can reduce surface runoff. Vegetation along watercourses should not be cleared indiscriminately
- Steep slopes can be terraced, thereby effectively reducing the length of slope
- The environmental impact of soil erosion can best be mitigated by removing vegetative cover only from the actual or specific site on which construction is to take place. Land clearing activities should be kept to the absolute minimum and use crushed stone rather than asphalt or concrete for surfacing parking areas
- Construction and land management should be scheduled in such a way that some types of vegetative cover could be established prior to the onset of intense rain or windstorms
- Cutting of mature trees to be avoided as far as possible, when trees need to be cut, compensatory plantation to be encouraged

6.3 Topography and Natural Contour

- The natural drain system should be maintained for ensuring unrestricted flow of water.
- No construction should be allowed to obstruct the natural drainage through the site.
- No construction is allowed on wetland and water bodies. If site is unavoidable, maintain certain setback distance as prescribed under different acts/regulations of the host country, if local or national standards are not available, the council may prescribe international standards
- Check dams, bioswales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water

6.4 Culture and heritage sites

- Preventive measure: Avoid areas close to archaeological, historical and cultural sites
- If avoidance is not possible, prepare a management plan to ensure the least damage to cultural, archaeological sites or maintain a safe distance as prescribed under act and regulation

6.5 Site preservation—following approach may be used for site preservation[1]

- Water bodies and channels—Attempt should be made to keep water bodies and natural channel as it is
- Natural Rocks—as good practice, retain at least 50% of natural rocks or as prescribed under different acts/regulations/bye-laws of the host country, if local or national standards are not available, the council may prescribe the international standards
- As far as possible preserve 75% of existing trees or as recommended by council or as mentioned in other acts/regulations or bye-laws
- Fertile topsoil (10–20 cm) to be stockpiled prior to construction, for future reuse. If the top soil in the project is not fertile or does not requires preservation, in such a case, the project may provide relevant justification

6.6 Quarry operation for supply of construction material, if applicable

- Waste rock/ spoil materials should be placed at designated areas with proper biological reclamation
- Water spray to reduce dust during quarry operations
- Compaction and re-vegetation of exposed areas should take place as soon as possible
- In case, the quarry gets exhausted, appropriate plan should be made for its restoration and reclamation
- Health and safety aspect must adhere with existing act and regulation

6.7 Amenities—construction workers

- Provide adequate housing to construction worker
- Water logging conditions should not be allowed inside the camp
- Provide adequate sanitary facilities—as specified in acts/regulations or labour/building byelaws. In case, if local standard is not available then provide provisions of at least 3 toilet seats and 3 urinals for the first 100 workers and one additional toilet seat and urinal for every 100 workers
- The sanitary measures should be provided separately for men and women
- Alternative cooking fuel should be provided to the labour so that the pressure on the local natural resources can be reduced
- Provide adequate first-aid and emergency facilities. Wherever there is an issue of reptiles the first aid kit should be equipped with snake and scorpion bite kit
- Arrange facility which ensures safe drinking water
- Provide personal protective equipment
- Provide sufficient measure for dust control
- Provide adequate illumination levels in construction work areas
- Provide site emergency alarm
- Day care/ crèche facility for workers' children, as specified in other acts/ regulations or labour/building byelaws. In case, if local standard is not available then use standard only if, more than 50 female building workers are employed full time.

Use of PPE during construction/ CSE

- Awareness on HIV/AIDS through poster, banner or information brochures or through training

6.8 Occupational Health and Safety

- Work permit for working at heights
- Ensure all passageways, walkways, and stairways must be kept free of materials, scraps or any types of obstructions
- Access to first aid box at construction sites
- Arrangement with nearest nursing homes/clinics/primary health centres by the owner or contractor to deal with any emergency at site
- A vehicle should be readily available at construction site to meet emergency situation
- The contractor should strictly follow the statutory child labour act
- Personal Protective Equipment such as helmets, hand gloves, safety shoes, nose masks, safety goggles should be provided to the workers
- Provisions for evacuation during an emergency— unforeseeable events and / or natural calamities

6.9: Protection from fire/explosions/lighting

- Adequate provisions should be made to avoid fire hazards due to short-circuiting
- Fire safety design and fire-fighting equipment consistent with national standards to avoid fire hazards
- Preparation of fire emergency action plan

- Electric shock Hazards—Restrict entry to substation area and provide appropriate colour coding and warning signs on facilities

6.10 Public safety

- Excavated areas should be properly demarcated
- Provision of barricading along the excavated trenches
- Provision of warning signage boards along the construction sites in local language
- Security system to prevent unauthorized entry

6.11 Green cover

- Encourage augmentation of green cover
- Minimum 1 tree / in every 80 Sq. mt of plot area or as prescribed under acts/regulations/building bye-laws. If local or national standards are not available, the council may prescribe international standards
- Compensatory plantation—3:1 ratio for felled versus planted trees

6.12 Climate change

- Maintain and adhere to the Nationally Determined Contributions (NDCs) submitted by the country. Initiative to be taken to pursue domestic mitigation measure to achieve the NDCs.
- Promote use of eco-friendly refrigerants and halons in order to minimize impact on the ozone layer.
- Initiate measures to comply with the Kigali Amendment to the Montreal Protocol on substances that deplete the ozone layer.

6.13 Public protection

- Any demolition or erection of building may pose danger to neighbourhood or property or is likely to cause public inconvenience, the project proponent must ensure and prepare management plan—fencing, hoarding or barricade to prevent the public from entering etc[2].
- Security system to prevent unauthorized entry
- Warning signage boards along the construction sites should be in local language

6.14 Adequate Parking

Building, commercial, industrial estate, township need to have adequate parking space to avoid traffic congestion and thus all construction project should adhere to law of land or building by law for detailed information on different building standards, refer Annexure 3: National Standards applicable for Building Construction Project, Section 4: The Urban Planning and Space Standard Regulations, 2018.

In case, if local standards are not available or obsolete, acceptable international standards be used—i.e. parking standards followed in other countries for different category of construction project. *See table 1: Good practice—parking standards for different buildings.*

Table 1: Good practice — parking standards for different buildings

S. No.	Land use	Parking Standards	Remark
1	**Residential**		
	Residential Plot Plotted Housing	2 Equivalent Car Space (ECS) in plots of size 250 300 sq. m and 1ECS for every 100 sqm. built up area, in plots exceeding 300 sqm.	
	Residential Plot Group Housing	2.0 ECS/100 sqm., built up area	
	Cluster Court Housing	2.0 ECS/100 sqm. built up area	
	Guest House/Lodging & Boarding House	2 ECS per 100 sqm. of built up area	
2	**Commercial Centres**		
	Convenience Shopping Centre/ Local Shopping Centre/Local Level Commercial areas	2 ECS / 100 sqm. of floor area	
	Service Market	2 ECS / 100 sqm. of floor area	
	District Centre/ Sub Central Business District/Sub City Level Commercial areas	3 ECS / 100 sqm. of floor area	
	Commercial Plot: Retail & Commerce City Centre	3 ECS / 100 sqm. of floor area	
	Hotel	3 ECS / 100 sqm. of floor area	For Population between 2–10 lakh —1 car parking space for every 4 guest room. For Population between 10–50 lakh—1 car parking space for every 3 guest room. For Population more than 50 lakh–1 car parking space for every 2 guest room2
	Service Apartments	3 ECS / 100 sqm. of floor area	
	Integrated Freight Complex/ Wholesale Market	3 ECS / 100 sqm. of floor area	In case of plots up to 300 sqm. common parking is to be provided
3	Socio Cultural Facilities		
	Community Hall	3.0 ECS / 100 sqm. of floor area	
	Recreational Club	2 ECS / 100 sqm. of floor area	
	Socio cultural activities such as auditorium, music, dance & drama, centre/meditation, spiritual centre etc.	2 ECS / 100 sqm. of floor area	
	Old Age Home/Care Centre for Physically /Mentally challenged / Working women/men hostel /Adult Education Centre / Orphanage/Children's Centre / Night Shelter	1.8 ECS / 100 sqm. of floor area	
	Sport facility for international sports event	2 ECS / 100 sqm. of floor area	

4	Public Semi Public		
	Integrated Office Complex	1.8 ECS/100 sqm. of floor area	The norms for local Government offices / Public Sector Undertakings under Government Land use shall be as per Integrated office complex
	District Court	1.8 ECS/100 sqm. of floor area	
	Amusement Park	3 ECS/100 sqm. of floor area	
	Metro	2 ECS/100 sqm. of floor area	
	Hospitals	2 ECS/100 sqm. of floor area	
	Veterinary Hospital & Dispensary	1.33 ECS/100 sqm. of floor area	
5	**Industry**		
	Industrial Plot up to 50 sqm. Area	2 ECS/100 sqm. of floor area	
	Industrial Plot 51sqm 400 sqm. Area	2 ECS/100 sqm. of floor area	
	Industrial Plot 401 sqm. and above	2 ECS/100 sqm. of floor area	
	Flatted group Industry (Min Plot size 400 sqm.)	2 ECS/100 sqm. of floor area	
6	Mixed Land use	Parking @ 2.0 ECS / 100 sqm. built up area shall be provided within the premises	--

Source: Model Building By-Laws, 2016 Town and Country Planning Organization — Ministry of Urban Development, India

The permissible Equivalent Car Spaces (ECS) for different land uses are as indicated in Table 2 below;

Table 2: Good practice — Permissible ECS for different land uses

S. No.	Use Premises	Permissible Equivalent Car Spaces (ECS) per 100 sqm. of floor area
1	Residential	2.0
2	Commercial	3.0
3	Industrial	2.0
4	Public Building	1.8
5	Semi Public Facilities	2.0
6	Mixed Land use	2.0

Source: Model Building By-Laws, 2016 Town and Country Planning Organization – Ministry of Urban Development, India

6.15: Energy Conservation Measures

- Use of energy efficient fixtures for outdoor and common area lighting.
- As a good practice, solar or other renewable energy should be installed to meet electricity generation up to 10% of the connected load or as prescribed in the local act/regulations/building bye-laws.
- Promotion of renewable energy to replace D.G. sets.
- As a good practice, solar water heating should be provided to meet 50% and encouraged to meet 100% of the hot water demand of the commercial and institutional building or as prescribed in the local act/regulations/building bye-laws.

Solar Water heating System

CSE library

Encourage solar water heating system in the following building

Domestic solar water heater, with a capacity of 100 lpd (litres per day), is sufficient to support a family of four or five members. It can replace conventional electric geyser of 2-kW and saves around 1500 units of electricity in a year and requires area of 3 m^2. to and lifespan of 15 to 20 years . Typically, a cost of 100 lpd electric geyser is between 275 to 400 USD. Depending on the requirement, capacity of solar water heating system may vary and effectively used in the following building projects:

- Hospitals and nursing homes
- Hotels, lodges, guest houses, group housing with a plot area of 1000 sq m.
- Hostels of Schools, Colleges and Training Centres with more than 50 Students
- Individual residential buildings having more than 150 sq m. plinth area
- Buildings of Railway Stations and Airports like waiting rooms, retiring rooms, rest rooms, and inspection bungalows and catering units
- Community hall and buildings for similar use
- Construction of religious buildings like church, mosque, etc.

In addition some other potential energy conservation measures which reduce the overall energy footprint are as follows:

- Encouraging solar passive architecture—example, sunshades, double glazed windows, smart glazing, window overhangs, roof treatments, ventilation, and day lighting, depending on the climatic zone where the house is constructed
- Low Energy Consumption Lighting Fixtures (Energy Efficient Electrical Appliances)
- Wall Window Ratio (WWR) fluctuate between 30% – 40 %
- Air leakage for fenestration and doors in AC building shall not exceed 2.0 l/s-sqm and for glazed swinging entrance doors and revolving doors shall not exceed 5.0 l/s-sqm
- Energy Efficiency in HVAC systems
- Lighting of Common areas by solar energy/LED devices
- Use of environment friendly materials in bricks, blocks and other construction materials, encouraged to use for at least 20% of the construction material quantity. These include flyash bricks, hollow bricks, Autoclaved Aerated Concrete (AACs) blocks, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.

Note: As a good practice, provision for solar water heating system should be put as condition while issuing ECC as in all the new buildings of load bearing capacity of the roof equal or greater than 50 kg./sqm.

6.16 Water resource management

Water management includes various aspects in building and construction project—such as water sourcing, conservation, wastewater treatment, rainwater harvesting, reuse and recycling of waste water etc. It also includes minimizing the pressure on the municipal supply and groundwater sources through recycling of water. The water conservation also has direct impact on energy saving by use of water efficient domestic appliances and its awareness among stakeholder is crucial for water conservation. For instance under normal conditions, water consumption per person for flushing is 45 litres (9 litre/flush with 5 number of uses). By using water efficient fixture, water consumption reduced to 21 litre[3].

The treatment of wastewater normally used for building sewage is based on biological processes. Today, different types of treatment can be adopted for wastewater treatment depending on availability of land, quantity and characteristics of the wastewater. In addition, artificial wetlands or reed bed systems or DWSS proved to be an effective method, for treating wastewater at the decentralized level.

6.16.1 Mitigation measures

- Avoid excavation during the rainy season to avoid erosion and siltation of water bodies
- Maintain a safe distance from water bodies
- No loose earth material should be allowed to leave unattended or cut/fill generated during construction should be kept at designated place to prevent water pollution
- Avoid areas, which are susceptible to erosion, such as those crossing steep slopes. If unavoidable, then consider construction of check dams and gabion structures
- Prohibit or restrict activities such as dumping of solids and liquid waste including oils into near water bodies. Prepare a spill prevention and containment plan
- Proper measures and plan for reducing water during construction activity such as curing, etc. should be taken, treated waste water wherever possible should be used for curing and other uses
- Encourage use of treated wastewater; at least 25% of the total water requirement for landscaping, flushing, and cooling tower make-up or follows benchmark as specified act/regulation or in or building bye-laws of the host country
- Separation of grey and black water should be done by the use of dual plumbing system
- Adequate plan for septage management
- Provision for water meter to estimate the water consumption. As a good practice water meter should be fixed at following (a) Municipal water supply and bore water consumption (b) if treated waste water is used for consumption (c) water consumption for air-conditioning cooling tower makeup, etc.
- Transformer and substation areas should be properly lined to avoid groundwater and soil contamination.

6.16.2 Rainwater harvesting

Rainwater harvesting should be encouraged to meet the water demand and augmentation of groundwater. It should be encouraged in all buildings having a plot size of 100 sq. m. or more[4]. A building of size 100 sq. meters area has potential to harvest as much as 55,000 liters per year from the rooftops. There are two main methods of harvesting rainwater (a) storage of rainwater on surface for future use (b) recharge to ground water. Recharging of ground water should be encouraged in residential buildings, commercial buildings or group housing societies having a plot area more than 500 sq. m. or above. In addition, rainwater harvesting practices should also be made compulsory in public buildings, markets, community centers, parking spaces, roads and parks etc. *See Table 3: Rainwater harvesting for different building types.*

Table 3: Good practice — rainwater harvesting to reduce water footprint for different building types

Category / Use	Area of plot (Sq. m.)	Provisions to be made
Residential Plotted Houses		
New Proposals	100 and above	Construction of Rain Water Harvesting Structure. Emphasis on both storage and reuse.
Group Housing		
New Proposals	All plot sizes	i. Emphasis on Strom Water Drainage, Rain Water Harvesting Structure and Recharging Well ii. Avoid concrete paving and use permeable materials for all open area
Public and semi – public buildings		
All proposals	All plot sizes	i. Encourage Rain Water Harvesting Structure, storage, reuse and recharge pits
Commercial / Mixed use		
All proposals	All plot sizes	i. Construction of Rain Water Harvesting Structure and storm water drainage ii. Percolation pits in soft landscape provisions and open spaces
Industrial		
All proposals	All plot sizes	i. Construction of Rain Water Harvesting Structure and storm water drainage i. Percolation pits in soft landscape and open spaces i. If applicable, use of abandoned bore wells to recharge ground water *(Note:- In case of polluted industries — provision should be made not to inject contaminated water into recharge structures and setback distance should be maintained to keep such structures away from sewer lines, septic tanks, soak pits, landfill and other sources of contamination)*

6.16.3 Monitoring

- Council should encourage physical monitoring of RWH in all the buildings above 1000 sq. m., while buildings less than 1000 sq. m. can be monitored on the basis of 10% random survey by a competent authority
- Authority may, prior to issuing Completion Certificates or NOCs for service connections, keep provision to include inspection of Rainwater Harvesting Structures

6.17 Air quality management

Table 4: Good practices for fugitive dust control are mentioned below:

<table>
<tr><th>Activities</th><th>Best Practices</th></tr>
<tr><td>Land-clearing/ civil works/ construction</td><td>• Water spray,
• Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible
• Use of personnel protective equipment (PPE)</td></tr>
<tr><td>Transportation of construction materials</td><td>• Covering the trucks/ dumpers to avoid spillage of construction material
• Speed control, reducing speed of a vehicle to 20 kmph reduces emission to a large extent
• Construction of speed bumps at a places where like hood of accident is high, it also reduce air pollution
• In cases where speed reduction is not effective to reduce fugitive dust, diverting traffic is a good option
• Water spray for the control of loose materials on paved or unpaved road surfaces (See Table: Fugitive emission controls and their efficiency)

Fugitive emissions controls and their efficiency
<table>
<tr><th>Control Type</th><th>Control Efficiency</th></tr>
<tr><td>Chemical Stabilization</td><td>0%–98%</td></tr>
<tr><td>Hygroscopic salts Bitumen/adhesives</td><td>60%–96%</td></tr>
<tr><td rowspan="2">Surfactants
Wet Suppression- Watering</td><td>0%–68%</td></tr>
<tr><td>12%–98%</td></tr>
<tr><td rowspan="2">Speed Reduction
Traffic Reduction</td><td>0%–80%</td></tr>
<tr><td>Not quantified</td></tr>
<tr><td rowspan="3">Paving (Asphalt/Concrete)
Covering with Gravel, Slag or Road Carpet
Vacuum Sweeping</td><td>85%–99%</td></tr>
<tr><td>30%–50%</td></tr>
<tr><td>0%–58%</td></tr>
<tr><td>Water Flushing/Broom Sweeping</td><td>0%–96%</td></tr>
</table>
Source: IFC 2007. Environmental, Health, and Safety General Guidelines</td></tr>
<tr><td>Material storages / warehouses</td><td>Encourage wind barrier or covered storage for construction material storage/warehouses</td></tr>
<tr><td>DG sets</td><td>Acoustic enclosure and tall stack for DG set. The minimum stack height of DG set is estimated by following equation
H = h + 0.2 capacity of DG in KVA
H = Total height of stack in metre
h = Height of the building in metres where the generator set is installed
KVA = Total generator capacity of the set in KVA
<table>
<tr><th colspan="2">Stack Height Standard for D. G. Sets</th></tr>
<tr><td>For Generators Sets</td><td>Total Height of Stack in Meters</td></tr>
<tr><td>50 KVA</td><td>Ht. Of the building + 1.5 meter</td></tr>
<tr><td>50–100 KVA</td><td>Ht. Of the building + 2.0 meter</td></tr>
<tr><td>100 —50 KVA</td><td>Ht. Of the building + 2.5 meter</td></tr>
<tr><td>A50 — 200 KVA</td><td>Ht. Of the building + 3.0 meter</td></tr>
<tr><td>200 — 250 KVA</td><td>Ht. Of the building + 3.5 meter</td></tr>
<tr><td>250—300 KVA</td><td>Ht. Of the building + 3.5 meter</td></tr>
</table>
Source: Central Pollution Control Board, New Delhi norms for DG sets stack height</td></tr>
<tr><td>Concrete batching plant, if applicable</td><td>• Air Pollution Control Measures (APCM)—cyclone followed by Bag filter
• Sprinklers for dust suppression due to the movement of vehicles
• Sprinkler system for wetting of ground and aggregate material storage area for dust suppression
• Covered conveyer belt and feeding hopper for the aggregates
• Provision of wastewater treatment plant (oil & mud separator) for washing of vehicle</td></tr>
</table>

6.18 Noise Management

- Earmuffs/ earplugs to workers, who are continuously exposed to high levels of noise during construction activities
- Silencers or enclosures for noise generating machines such as Diesel Generator (DG) sets, compressors, etc. during the construction stage
- Construction techniques and machinery selection should taken in to account the need to minimize noise and vibration

6.19 Waste management

(a) Labour colony
- Provide facility for waste collection and segregation at construction site to ensure hygiene
- Provision of mobile toilets and timely disposal of solid waste

(b) Construction and demolition waste
- Encourage recycling and reuse of construction and demolition wastes
- Non-recycling wastes can be used for filling low lying area or road construction
- Leftover construction or repair materials including stones, sand, cement, packaging material, papers, cartons, oils, cans, bags, wires, metal objects, housing sheds should be removed and safely disposed of or reused elsewhere.

(c) Municipal solid waste
- Waste segregation and compositing of organic waste as a manure should be encouraged
- At household level, placing three-bin is a good option for waste segregation or as prescribed under other acts/regulations/building bye-laws
- Provide separate bins to collect dry waste (paper, plastic, metals, glass, etc.,) and wet waste (organic), at all the floors and common areas of the building (high rise building and commercial area like mall, schools, offices, etc.). Further, divert the collected waste to a centralized facility, which is easily accessible for hauling
- A storage facility should be designed by considering quantities of waste generation and population densities
- A storage facility is easily accessible to users; it should be in a radius of 25 meter from the source or as prescribed in other acts/regulations/ building bye-laws of the host country.
- Local authorities should provide different coloured bins or collection points for different categories of waste. The coloured bin — dark grey for non-recyclable waste, green for kitchen food/compostable garden waste and blue for paper (generally used for flats, schools, offices etc).
- Encourage compositing in township, group housing, and individual house. The manure can be used for lawn and park development
- In multi - storeyed buildings provide bulk dustbin type container, as a general thumb rule — of capacity 1100 litre (one bin) is adequate to cater 60 units, for smaller blocks[5], or as prescribed in other acts/ regulations/building bye-laws of the host country.

Getty images

6.20 Other wastes

- Wherever applicable, It is encouraged to provide separate bins for safe disposal of the following hazardous waste, at the centralized facility like (a) batteries (b) E – waste (c) lamps and (d) medical waste, if any
- Hazardous waste such as spent lubricating, hydraulic and transformer oils should be collected and disposed off through an authorized dealer

6.21 Specific Environmental and Social Management Plan (ESMP) for Industrial Estate[6]

Apart from above mentioned mitigation measures; there are some specific provisions which need to be taken care of during the development and construction of industrial estates. These are as mentioned below;

6.21.1 Statutory Compliance

- Statutory clearances such as the approvals for storage of diesel, fire department, civil aviation department etc from appropriate authority should be obtained
- The buildings should have adequate distance (as per local building bye laws) to enable them to allow movement of fresh air and passage of natural light, air and ventilation in accordance with guidelines of local authorities

6.21.2 Air quality monitoring and preservation

- The project proponent should install Ambient Air Quality monitoring station for monitoring main pollutants (e.g. PM 10 and PM 2.5 in reference to PM emission, and SO2 and NOx etc) within and outside the industrial area. The number of monitoring stations and its location can be prescribed as per acts/ regulations, if local and national standards are not available the Council may recommend international standards — as a good practice air quality monitoring should be conducted at least at four locations, one on upwind direction and three stations in downwind at an angle of 1200. Further, stations should be designed in such as way it covers all sensitive receptors.

- The D.G. sets to be used during development/construction phase shall confirm to air and noise emission standards. Storage of diesel shall be made underground and necessary approvals/permissions from the competent authority are to be obtained
- Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking, loading and unloading shall be fully internalized.

6.21.3 Water quality monitoring and preservation

- Construction of storm water drains for collection, storage and its re-use as per local standards
- Water demand during development/construction shall be reduced by use of pre-mixed concrete, curing agents and other best practices
- The project proponent shall monitor regularly ground water quality at least twice a year (pre and post monsoon) by installing sufficient numbers of piezometers/sampling wells in and around the areas through labs recognized by NEMC or accredited laboratories
- All efforts should be made to minimize water consumption in the industrial estate.
- Explore possibility for Zero Liquid Discharge (ZLD).
- In case of Common Effluent Treatment Plant (CETP), member industries should treat the effluent to meet the prescribed CETP inlet norms
- The member units shall provide RCC tanks for storage of effluent for monitoring the characteristics of effluent before taking into the CETP for further treatment
- Proper flow meters along with online monitoring facilities shall be provided to monitor the effluent quality and quantity sent from member industries to CETP and from CETP to the final disposal/re-use on a continuous basis

6.21.4 Noise monitoring and prevention

- Overall ambient noise levels should conform to the national standards

6.21.5 Energy conservation measures

- Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly
- Provide LED lights in their offices and residential areas.

Solar Panelling on rooftops, Meeta Ahlawat / CSE

6.21.6 Waste Management

- Disposal of muck during development/construction phase should not create any adverse effect on the neighbouring communities and be disposed off taking the necessary precautions for general safety and health aspects of people. Only approved site should be used for storage and disposal.
- All hazardous waste generated during development/construction phase, shall be disposed-off as per applicable and norms with necessary approvals of the NEMC
- Used LEDs and CFLs should be properly collected and disposed-off/sent for recycling as per the prevailing guidelines/regulations to avoid mercury contamination.
- Air pollution and the solid waste management aspects needs to be properly addressed ensuring compliance of the Construction and Demolition Waste Management.

C&D Waste, Vikas Choudhary / CSE

6.21.7 Green Belt

- The green belt/plantation of up to a width of 15 m should be provided all along the periphery of industrial area with native species. An attempt should be made to keep 33% of total area of industrial site as green area with native species or as prescribed in acts/regulation or as recommended by council. The time bound action plan for green belt/plantation be submitted to NEMC or other relevant authority.

6.21.8 Human health issues

- Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
- Occupational health surveillance of the workers should be done on a regular basis and records maintained as per prescribed acts/rules/regulations/bye-laws of the host country.

6.21.9 Miscellaneous

- Internal road widths within the industrial area shall be minimum 18 m Right of Way (ROW) or as prescribed under different act / regulations / bye-laws
- Parking space to accommodate trucks, cars, two wheelers and bicycles shall be provided as per the norms.

Annexure 7: Framework for Gender Inclusion

Table 1: Framework for gender inclusion

Step of EIA	Gender inclusion	Stakeholders
Screening or project feasibility	At this stage, it is advisable to conduct gender analysis based on data collected through reconnaissance surveys in the project-affected area to understand gender issues in terms of: (a) How they are structured, how they function, and the roles and responsibilities of women and men (b) Livelihood (c) Income distribution (d) Health issues (e) Dependence on natural resources **Benefits:** Doing so will provide a quick reality check on gender dynamics. Gathering information would help to determine and frame detailed Terms of Reference (ToRs) at the scoping stage. **Method:** Literature review (for example, review of other project reports), meeting with local authorities, public meeting, consultation with village and focused group discussions with women stakeholders etc	Local government, NGOs, CBOs, affected people, self-help groups etc.
Scoping	At this stage, data collected from the reconnaissance survey can be used to explore in detail questions like: • Issues in need of immediate redressal • How to proceed with the gender study • Extent of the gender engagement; and analysis needed • Kind of infrastructure and expertise needed • Target groups to be involved • Major constraints (such as women representation and active participation, language to be used, male-dominated spaces, other issues of marginalization etc.) • How to inform affected communities about the project and its implication • Appropriate strategies for participation of women • Appropriate indicators and benchmarks to monitor performance **Benefits:** Makes assessment focused and inclusive Tools: Involvement of gender specialists, participation of women, identifying NGOs, CBOs, women's groups and encouraging their participation, attracting attention of local authorities etc., with an objective to building consensus on set questions for gender assessment.	Project proponent, gender specialist, affected women etc.
Data collection	At this stage, data is collected from project-affected areas on pre-tested questionnaires, depending on potential impacts on gender. Prepare questions for in-depth interviews (structured and non-structured), focus group discussions, resource mapping, etc. The data must be collected in consultation with women, men, indigenous people, ethnic groups, women's organizations and other community-based organizations, with active involvement of women and men separately and in groups or both to capture data diversity of the community. **Benefits:** Availability of disaggregated data on gender, women-specific concerns, information on possible impacts and potential solutions to mitigate adverse impacts.	Affected people, gender specialists, investigation team (lead researcher, research investigators etc.)
Impact Assessment	This step involves data entry, cleaning of data, outputs etc. Further, impacts on gender are identified, predicted and evaluated using the baseline information on the one hand and the features of the project on the other hand (cause-effect relationship) Gender impact predictions are often done by using expert opinions, drawing comparisons with similar projects and people and understanding larger gender issues. The criteria for evaluating the significance of gender impacts and their effects should be set in advance based on scoping and local standards, wherever possible. Where local standards are not available, acceptable international standards should be used, for instance those of International Finance Corporation (IFC), The World Bank or standards and guidelines of other countries which incorporate best practices on gender. As a good practice in gender impact evaluation, it is better to use established procedures as set during the scoping, or guidelines or relevant criteria which are comparable. **Benefits:** • Gender assessment lets specialists and planners to understand the impact of a project on women, men, children, disadvantaged groups, and on the economic and social fabric of the communities. • A good gender assessment or analysis will help frame sound mitigation measures.	Gender specialist, investigation team (researchers) and other stakeholders etc.

Step of EIA	Gender inclusion	Stakeholders
Mitigation	The key objectives of gender mitigation are to ensure that the gender impacts remain within acceptable levels or enhance their socio-economic condition. Following are the mitigation hierarchies for deciding measures: • To avoid or prevent significant impacts on women and address their specific concerns • If not avoided, provide remedial measures for the impacts and specific concerns • Remediate and compensate	Gender specialist, and other stakeholders such as local NGOs, women's groups etc.
Environmental Management Plan (EMP)	Gender Management Plan (GMP) is a framework that should be prepared separately and integrated with the EMP for implementation and execution of gender mitigation measures and alternatives. The objectives of a gender management plan are: • To ensure that gender mitigation measures are properly implemented • To establish schemes and procedures for this purpose • To ensure that proposed mitigation measures comply with the laws and regulations of the host country, if applicable • A backup action plan when unanticipated impacts occur The GMP outlines: • A plan for operation or execution of the recommended mitigation plan, including assigning responsibility and timely completion • The detailed estimated costs to execute the gender mitigation plan **Benefits:** A timely implementation of planned GMP will reduce agitation and conflicts, improve acceptance, help build rapport with local communities, and reduce regulatory roadblocks. It also sets examples for other projects	Project proponent, local governments, local NGOs and women groups
Monitoring	Some of the key issues to be considered during monitoring include: • Identify a senior official as the focal person for oversight of GMP implementation for coordination with and data management of all stakeholders • To monitor whether implementation of GMP is as per schedule • Monitor gender participation, and grievance disposal (establish a grievance redress cell) • Check the effectiveness of gender-sensitive measures in reducing risks and enhancing benefits of the project for women.	Affected people, project proponent, local governments, NGOs and women groups

Definitions

1. Tourism and Recreational Development

''tourism" means activities conducted by a person travelling to a place outside his usual environment for more than twenty four hours and less than a year and whose main purpose of travel is other than the exercise of an activity remunerated from within the place visited; and where this activity is taking place in Tanzania shall be known as domestic tourism; **(as given in Tanzania Tourism Act, 2008)**

"tourism facility" means a place, thing or premises managed by a tourism operator and which regularly or occasionally provides services or products for utilization by tourists or visitors for purposes other than exercise of an activity remunerated from within the place visited; **(as given in Tanzania Tourism Act, 2008)**

2. Beach Front

''coastal zone'' means the area from the baseline of territorial sea landward side to 60 meters as prescribed by the Land Act, the land adjacent to natural or manmade water bodies or water mark; **(as given in The Fisheries Act, 2003)**

3. Building & Civil Engineering Industry / Building construction sector

"building operations" includes rebuilding operations, structural alterations or additions to buildings and other similar operations and the making of access roads, railways, waterworks, sewerage and draining works, electrical and telephone installations and any road works preliminary to, or incidental to the erection of buildings; (as given in the Urban Planning Act, 2007)

"engineering operations" includes the formation of or laying out roads and means of access to roads; **(as given in the Urban Planning Act, 2007)**

"development" means the carrying out of any building operation, engineering operation or mining operation in, on, under or over any land, the sub-division of laying out of land, or the making of any change in the use of land, but does not include-
(a) the making of any change of use from a purpose within any class which may be prescribed to the use thereof for any other purpose within the same class; or
(b) any other operation or change of use which may be prescribed; **(as given in the Urban Planning Act, 2007)**

"building" means any three dimensional structure or form ·constructed for the purpose of defining space, within space or around space. Whether that space is directly or indirectly used. **(as given in Architects and Quantity Surveyors (Registration) Act, 2010)**

"construction work" means any work undertaken by architectural or quantity surveying firm and includes

(a) pre-design, the design and post design. drawing and supervision of construction of a three dimensional structure or form of whatsoever material constructed for the purpose of defining space within space or around space, whether that space is directly or indirectly used,
(b) rehabilitation, redesign, alteration and supervision of such rehabilitation, redesign or alterations,
(c) seeking and obtaining a planning consent and any other permit or certificate in respect of buildings or structures similar to buildings; and
(d) advisory services in respect of buildings or structures similar to buildings; **(as given in Architects and Quantity Surveyors (Registration) Act, 2010)**

4. Township and housing estate

"building scheme" includes a scheme of development whereby land or estate is laid out in lots and built upon for the purpose of sale or otherwise in lots or sections by a common vendor to purchasers; **(as given in the Urban Planning Act, 2007**

5. Industrial estate –
"**The export processing zone** established or declared as such may consist of a developed, partly developed or underdeveloped area of land or may comprise of a single factory unit or group of factory units." **(as given in Section 3(3) of the Export Processing Zone Act, 2002)**
"**Special economic zones** may include one or more of the following area – such as industrial parks" **(as given in Section 7(a) of Special Economic Zones Act, 2006)**

6. Minister means the Minister responsible for matters relating to the environment; (as given in Environment Management Act, 2004)

7. Council means the National Environment Management Council (as given in Environment Management Act, 2004)

8. Appraisal process means the act by which the NEMC recommends a project to the Minister for approval (as given in Regulation 7(4), 9(4), Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 and Part VI of Environmental Impact Assessment and Audit Regulations, 2005)

9. Location sensitivity , referring to Environmental Protected Areas and Environmental Sensitive Areas

"Environmental Protected Areas" are those areas which the Minister may, on recommendation of the National Environmental Advisory Committee declare any area of land which is ecologically fragile or sensitive to be an Environmental Protected Area. **(as given in Section 47(1) Environment Management Act, 2004)**

"Environmental Sensitive Areas" are those areas where the Minister considers it necessary, he may by order published in the *Gazette,* declare any area to be environmentally sensitive area under this Act. **(as given in Section 51(1) Environment Management Act, 2004)**

10. Forest land diversion
Referring to **"concession of forest land"** any person who desires to obtain a concession of forest land within a national forest reserve or a local authority or village forest **(as given in Regulation 24 Forest Regulations, 2003)**

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15. The Forest Act, 2002
16. The Land Acquisition, 1967
17. The Land Use Planning Act, 2007
18. The Explosive Act, 1963
19. The Public Health Act, 2009

Tanzania's Development Vision 2025, set up by the government to transform Tanzania into a middle income and semi industrialized nation by 2025, has led to rapid urbanization. This growth in urbanization has allowed the construction industry to grow significantly. The building stock including the residential, commercial and others is expected to increase, and large tract of lands will be converted into housing estates, high rise commercial buildings, recreational areas, institutional and industrial facilities. These sector-specific guidelines for Building Construction sector envisage to ensure that the development in the sector continues to take place but in an environmentally sustainable manner, and has linkages with cross-generational equity.

These guidelines intend to assist government authorities, EIA practitioners, departments responsible for decision making and other stakeholders to design, conduct and implement EIA. It will further help deepen and build common understanding of environmental issues associated with the sector and facilitate greater stakeholder cooperation.