CHAPTER 10 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

10.1 LEGAL PROCESSES OF ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

10.1.1 OUTLINE OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) SYSTEM OF ZAMBIA AND ITS APPLICATION TO THE PROJECT

ECZ requires a Strategic Environmental Assessment (SEA) in the Master Plan and an Environmental Impact Assessment (EIA) in each phase of Feasibility Study for this project.

(1) Strategic Environmental Assessment (SEA) Process

At present, the SEA process is now being constructed in Zambia and the guidelines of the SEA process are also being prepared.

The SEA process for the LS-MFEZ project will be designed and tailored to the specific nature, demands, character and constraints of the area. Process design will call for an inclusive and consultative process involving Central Government Administrations, City and District Government Agencies, Traditional Authorities, Associations and NGOs, Civil Society, the Private Sector, and other interested parties.

a. Screening:

Any Plan or Programme likely to engender environmental, social or economic impacts will qualify for an SEA. As such, it will study significant positive, negative and cumulative impacts that can be mitigated or optimised through effective SEA process implementation.

b. Scoping:

Scoping will introduce all stakeholders to the SEA process and encourage them to participate both in the planning stages and later in the assessment stages. National and Regional Priorities will shape the process but these must be considered in terms of local priorities and development strategies. These must include both the priorities defined by national and traditional government authorities.

During the scoping stage of SEA:

- The objectives of the SEA are agreed to.
- The organisational and operational framework of the assessment is described.
- The spatial framework for the assessment is agreed to.
- The temporal framework to be considered during the assessment is agreed to.
- Priority themes to be considered during the assessment are identified.
- Options and alternatives to be considered during the Assessment are agreed to and a framework for the introduction of additional stakeholder alternatives is prepared:
- Necessary information and sources of information are identified.
- Existing sector plans specific to the spatial context of the assessment are identified and made available.
- A reference group is designated and terms of reference are drafted as required.
- A Zambian SEA Process Coordinator is appointed by the Proponent and endorsed by the Reference Group.
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The Scoping stage serves to focus the SEA and provides the Reference Group with the means to assess progress and ensure that the Process does not venture outside its agreed scope.

c. Assessment and Mitigation:

The Assessment Phase considers the environmental, social, economic and developmental impacts of the proposed programme and its alternatives. Assessment Phase effectively contributes to:

- The identification of: Natural assets, Risk areas, Development constraints, Planning conflicts, Conflicting resource demands, Predicted resource demand, Predicted urban expansion and investment areas, Demographic trends and settlement patterns, etc. Impacts (points and cumulative) are identified and analysed.
- The identification of sectoral synergies and inconsistencies will lead to the identification of options and opportunities.
- The preparation of an Environmental Management Plan detailing mitigation required to effectively address constraints, risks, and impacts will be identified by the process.

In addition, and as a direct result of its participative nature, the assessment stage is a valuable integration and consensus building instrument vital to the outcome of the SEA process.

The results of the Assessment Phase are compiled to prepare a Draft SEA Report which is then subjected to a further stakeholder consultation and validation procedure and adjusted as necessary to prepare the final SEA Report.

d. Public Consultation:

The inclusive and participatory SEA Process is tailored to the Zambian context. In order to ensure the widest possible participation, the process will ensure that the findings, recommendations and draft reports are widely circulated. Circulation will include public presentations at organised venues (such as village schools) in the concerned Districts.

e. The SEA Report:

- The Report is the outcome of the process.
- The SEA Report is a concise document supported by Annexes that presents the findings of the process and serves to inform both the proponent and relevant Sector on the need to introduce adjustments, mitigation or other relevant recommendations.
- The report will inform future planning, programming and decision making processes targeting the LS-MFEZ.
- The report specifies the means to monitor progress against agreed baselines. The Report also describes how the monitoring will be carried out, over what period and by whom.

(2) Environmental Impact Assessment (EIA) Process

The EIA process will be carried out according to both the EIA system and the results of the SEA.

a. Summary of EIA System
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According to the Environmental Protection and Pollution Control Act No.12 of 1990, Environmental Impact Assessment Regulations (Statutory Instrument No.28 of 1997) are described. This system requires that a project developer will assess impacts on environment and society induced by the project in order to prevent or mitigate the negative impacts on the environment and society before the project will be implemented.

b. Implementation Framework of EIA

A project developer will not implement a project, unless the project brief or an environmental impact assessment has been concluded in accordance with these Regulations and the Council has issued a decision letter.

c. Projects for which a project brief is required

Projects requiring a project brief are shown in Table 10.1.1, and other cases for which a project brief is required are shown in Table 10.1.2.

<table>
<thead>
<tr>
<th>Table 10.1.1 Projects for which a Project Brief is Required</th>
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<tbody>
<tr>
<td>Project for which a project brief is required</td>
</tr>
<tr>
<td>a Urban area rehabilitation</td>
</tr>
<tr>
<td>b Water transport</td>
</tr>
<tr>
<td>c Flood control schemes</td>
</tr>
<tr>
<td>d Exploration for and production of hydrocarbons including refining and transport</td>
</tr>
<tr>
<td>e Timber harvesting and processing in forestry</td>
</tr>
<tr>
<td>f Land consolidation schemes</td>
</tr>
<tr>
<td>g Mining and mineral processing, reduction of ores, minerals, cement and lime kilns</td>
</tr>
<tr>
<td>h Smelting and refining of ores and minerals</td>
</tr>
<tr>
<td>i Foundries</td>
</tr>
<tr>
<td>j Brick and earthen manufacture</td>
</tr>
<tr>
<td>k Glass works</td>
</tr>
<tr>
<td>l Brewing and malting plants</td>
</tr>
<tr>
<td>m Plants for manufacture of coal briquettes</td>
</tr>
<tr>
<td>n Pumped storage schemes</td>
</tr>
<tr>
<td>o Bulk grain processing plants</td>
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<tr>
<td>p Hydro power schemes and electrification</td>
</tr>
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<td>q Chemical processing and manufacturing</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Table 10.1.2 Other Cases for which a Project Brief is Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other projects for which a project brief is require</td>
</tr>
<tr>
<td>a Resettlement scheme</td>
</tr>
<tr>
<td>b Storage of hydrocarbons</td>
</tr>
<tr>
<td>c Hospitals, clinics and health centers</td>
</tr>
<tr>
<td>d Cemetery designation</td>
</tr>
<tr>
<td>e Touring and recreational development in national parks or similar reserves</td>
</tr>
<tr>
<td>f Projects located in or near environmental sensitive areas such as:</td>
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<tr>
<td>i) indigenous forests</td>
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<table>
<thead>
<tr>
<th>ii)</th>
<th>wetland</th>
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<tbody>
<tr>
<td>iii)</td>
<td>zones of high biological diversity</td>
</tr>
<tr>
<td>iv)</td>
<td>areas supporting populations of rare and endangered species</td>
</tr>
<tr>
<td>v)</td>
<td>zones prone to erosion or desertification</td>
</tr>
<tr>
<td>vi)</td>
<td>areas of historical and archaeological interest</td>
</tr>
<tr>
<td>vii)</td>
<td>areas of cultural or religious significance</td>
</tr>
<tr>
<td>viii)</td>
<td>areas used extensively for recreation and aesthetic reasons</td>
</tr>
<tr>
<td>ix)</td>
<td>areas prone to flooding and natural hazards</td>
</tr>
<tr>
<td>x)</td>
<td>water catchments containing major sources for public, industrial or agricultural uses</td>
</tr>
<tr>
<td>xi)</td>
<td>Areas of human settlements (particularly those with schools and hospitals)</td>
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</table>


A developer will prepare a Project Brief, starting the following in a concise manner:

i) description of the environment at the site

ii) objectives and nature of the project and reasonable alternatives that have been considered

iii) main activities that will be undertaken during site preparation, and construction and after the development is operational

iv) raw and other main materials that the project will use

v) products and by-products, including solid, liquid and gaseous waste generation

vi) noise level, heat and radioactive emissions, from normal and emergency operations

vii) expected socio-economic impacts of the project and the number of people that the project will resettle or employ, directly, during construction and operation, etc.

viii) expected environmental impact of the project, taking into account the provisions of paragraphs iii) to vii)

ix) expected effects on bio-diversity, natural lands and geographical resources and the area of land and water that may be affected through time and space

x) description of mitigation measures and any monitoring programmes to be implemented.

d. Projects for which EIS is required

Projects requiring EIS are listed in Table 10.1.3 below. In addition, each enterprise which operates in LS-MFEZ must follow EIA procedures. Consequently, this study will not support an EIA procedure for each enterprise.

<table>
<thead>
<tr>
<th>Project type</th>
<th>Activities for which EIS is required</th>
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<tbody>
<tr>
<td>Urban development</td>
<td>Designing of new town which is equal to 5 ha or more or sites covering 700 dwellings and above</td>
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<td></td>
<td>Establishment of industrial estates</td>
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<td></td>
<td>Establishment or expansion of recreational areas such as golf course, which would attract 200 or more vehicles</td>
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<td></td>
<td>Shopping centers and complexes with 10,000 m² and above floor area</td>
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</table>
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<table>
<thead>
<tr>
<th>Project type</th>
<th>Activities for which EIS is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>All major roads outside under areas, the construction of new roads and major improvements over 10 km in length or over 1 km if the road passes through a National Park or Game Management Area</td>
</tr>
<tr>
<td>Water Pipelines</td>
<td>diameter 0.5 m and above and length 10 km outside built up area</td>
</tr>
<tr>
<td>Forest related activities</td>
<td>Clearance of forestry in sensitive areas such as watershed areas or for industrial use 50 ha or more</td>
</tr>
<tr>
<td></td>
<td>Reforestation and afforestation</td>
</tr>
<tr>
<td></td>
<td>Wood processing plants – 1,000 tons or more</td>
</tr>
<tr>
<td>Processing and manufacturing industry</td>
<td>Cement works and lime processing – 1,000 tons or more a year</td>
</tr>
<tr>
<td></td>
<td>Fertilizer manufacturing or processing – 1,000 tons or more a year</td>
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<tr>
<td></td>
<td>Tanning and dressing of hides and skins – 1,000 skins a week</td>
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<td></td>
<td>Abattoirs and meat processing plants – 20,000 carcasses and above a month</td>
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<tr>
<td></td>
<td>Fish processing plant – more than 100 tons a year</td>
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<td></td>
<td>Pulp and paper mills – daily output 50 air dried tons and above a day</td>
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<tr>
<td></td>
<td>Food processing plants – 400 tons or more output a year</td>
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<tr>
<td>Electrical infrastructure</td>
<td>Electricity generation stations</td>
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<tr>
<td></td>
<td>Electrical transmission lines – 220 kV and more than 1 km long</td>
</tr>
<tr>
<td></td>
<td>Surface roads for electrical and transmission lines more than 1 km long</td>
</tr>
<tr>
<td>Waste Disposal</td>
<td>Site for solid disposal: construction of permanent disposal site with 1,000 tons and above a day.</td>
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<tr>
<td></td>
<td>Sites for hazardous disposal 100 tons or more a year.</td>
</tr>
<tr>
<td></td>
<td>Sewage disposal works - with capacity of 15,000 liters or more a day</td>
</tr>
<tr>
<td>Natural conservation areas</td>
<td>Creation of national parks, game management areas and buffer zones</td>
</tr>
<tr>
<td></td>
<td>Commercial exploitation of natural fauna and flora</td>
</tr>
<tr>
<td></td>
<td>Introduction of alien fauna and flora to local eco system</td>
</tr>
</tbody>
</table>

| Findings of Project Briefs   | EIA is found to be necessary based on project briefs |


e. Terms of references for EIS

When EIS is required, a developer will prepare terms of reference for EIS. The following impacts and issues may, among others, be considered for inclusion in the preparation of the terms of references:

i) Ecological consideration, including:

- Biological diversity Effect on number, diversity, breeding sites, etc. of flora and fauna
- Sustainable use including: Effects of soil fertility, Nutrient cycles, Aquifer recharge and water run-off rates, etc, Aerial extent of habitats, and Bio-geographical processes.

ii) Social, economic and cultural considerations including:

- Effects on generation or reduction of employment in the area
- Social cohesion or disruption (resettlement)
- Immigration (including induced development when people are attracted to a
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devlopment site because of possible enhanced economic opportunities
- Communication – roads opened up, closed, re-routed
- Local economic impacts.

iii) Landscape:
- Views opened up or closed
- Visual impacts (features, removal of vegetation, etc.)
- Compatibility with surrounding areas
- Amenity opened up or closed, e.g. recreation facilities.

iv) Land use:
- Effects of on land uses and land potential in the project area and in the surroundings area
- Possibility of multiple uses

v) Water:
- Effects of surface water quality and quantity
- Effects on groundwater quality and quantity
- Effects on the flow regime and the water course.

vi) Air quality:
- Effects on the quality of the ambient air of the area
- Types and amount of possible emissions (pollutants).

f. Guidelines for developers in conducting EIA

Guidelines for developers in conducting EIA consist of the following items:

i) Preliminary actions:
- Submission of the project brief (PB) to the Environmental Council of Zambia
- Appointment of Coordinator
- Selection of the experts that will comprise the team that will undertake the study
- Allocation of work to the team member of the purpose of carrying out the scoping exercise
- Review and determination of the applicable laws, regulations and standards
- Identification of the various alternatives for the development of the project (sites, technology and design).

ii) Scoping (or identification of impacts):
- Identification of all the possible environmental impacts of the project
- The coordinator, the team and the Environmental Council of Zambia will
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determine which of the impacts will be the subject of the study based on the following criteria:

· magnitude, including the impact of the project on environmental resources
· extent, including the geographical extent of the impact
· significance, including the actual effects of the impacts on the environmental resource
· special sensitivity, including impacts which are significant in the special local economic, social and ecological setting.

- The developer will submit the names and qualifications of all persons to carry out the study to the Council for approval.

iii) Baseline study

iv) Impact evaluation:
- Quantitative change where change can be quantified
- Instead of quantitative change where change cannot be quantified, the impact of the project will depend on the environmental acceptability of the project.

v) Public participation in environmental impact study:
- The team will seek the view of the communities which are likely to be affected by the project
- The views sought above will be considered in the development of mitigation measures.

vi) Identification of mitigation measures:
- Identification of measures for elimination (where possible), or reduction of environmental impacts for various alternatives identified in the study.
- Including the cost mitigation measures into impact evaluation
- Where necessary, the team will create an alternative based on the mitigation.

vii) Assessment (or comparison of alternatives):
- Comparison of all the alternatives from the basis of economic, socio-cultural and environmental gains and costs
- The team will rank and recommend all alternatives to the developer on the basis of sound environmental and economic analysis.

viii) Decision making by the developer

ix) Submission of the report to the Environmental Council of Zambia:
- The team will complete the EIS
- The developer will submit the report to the Environmental Council of Zambia.
x) Implementation of the project and post assessment audits:
- If the Council approves the EIS, the developer may implement the project
- The team will carry out a post assessment environmental audit between 12~36 months after the commencement of the project.

(3) Application to this Project
According to Table 10.1.3, each phase development (leveling of development lands and inner infrastructures) in LS-MFEZ area will require an EIA process due to the following reasons:

a. Designing of new town which is equal to 5 ha or more or sites covering 700 dwellings and above
b. Establishment of industrial estates
c. Clearance of forestry in sensitive areas such as watershed areas or for industrial use 50 ha or more
d. Others

For individual factories and institutions which move in, implementation of EIS will be considered according to contents of their activities.

For individual outer infrastructures, governmental offices and companies which take charge will carry out EIA processes.

10.1.2 JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS
The proposed LS-MFEZ area is located in the area extending outside of Lusaka city as shown in Figure 4.2.2. LS-MFEZ Project is categorized as "A" in JICA Guidelines for Environmental and Social Considerations. Category A is considered to be significant adverse impacts. Its reasons are as follows:

a. The proposed candidate site is a groundwater recharge area for its surrounding areas.
b. The proposed candidate site will be developed as an industrial park on the large scale, and it is estimated that the ground, surface water and groundwater around area will be contaminated.
c. People who illegally cultivate maize in the proposed candidate site will be affected.
d. The project requires a detailed environmental impact assessment by environmental law and the standards of the recipient governments

(1) Requirements for the Master Plan Study with Category A
Requirements for the Master Plan Study with Category A are as follows

a. For Category A studies, JICA consults with local stakeholders in collaboration with the recipient governments after disclosure of drafts of scoping, and incorporates results of consultation into TOR. The consultation widely covers the needs of projects and the analysis of alternatives;

b. The TOR includes an understanding of needs, the impacts to be assessed, study methods, an analysis of alternatives, a schedule and other matters. JICA endeavors to
incorporate the concept of Strategic Environmental Assessment into such studies. JICA then obtains an agreement on the TOR with the recipient governments through consultations;

c. In accordance with the TOR and in collaboration with the recipient governments, JICA conducts IEE-level environmental and social considerations studies, and analyzes alternatives including a “without project” situation. During studies, JICA incorporates its results into related reports prepared in a process accordingly;

d. For Category A studies, when preparing a rough outline of environmental and social considerations, JICA holds a series of stakeholder consultations in collaboration with the recipient governments after information disclosure and incorporates the result of consultation into these studies;

e. Based on the above-mentioned procedure, JICA prepares drafts of the final reports incorporating results of environmental and social considerations studies, and explains them to the recipient governments to obtain their comments. For Category A studies, JICA discloses the drafts to and consults with local stakeholders in collaboration with the recipient governments, and incorporates the results of that consultation into the final reports.

(2) Requirements for the Feasibility Study with Category A

Requirements for the Feasibility Study with Category A are as follows

a. For Category A studies, JICA consults with local stakeholders in collaboration with the recipient governments after disclosure of drafts of scoping, and incorporates results of consultation into TOR. The consultation widely covers the needs of projects and the analysis of alternatives;

b. The TOR includes an understanding of needs, the impacts to be assessed, study methods, an analysis of alternatives, a schedule and other matters. JICA then obtains an agreement on the TOR with the recipient governments through consultations;

c. In lines with the TOR and in collaboration with the recipient governments, JICA conducts EIA-level environmental and social considerations studies including a monitoring plan, an institutional arrangement, and mitigation measures to avoid, minimize or compensate for adverse impacts. JICA analyzes alternatives including a “without project” situation. JICA incorporates its results into related reports prepared in a process accordingly;

d. When preparing a rough outline of environmental and social considerations, JICA consults with local stakeholders, after information disclosure and incorporates results into the studies;

e. JICA prepares drafts of the final reports incorporating results of environmental and social considerations studies, and explains them to the recipient governments to obtain their comments. After disclosure of a draft of the final reports, JICA consults with local stakeholders in collaboration with the recipient governments, and incorporates the results of that consultation into the final reports.
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(3) Be Related With the Attainment on JICA Guidelines for Environmental and Social Considerations

1) For the Resettlement of the Settlers and the Seasonal Informal Farmers and so on in the LS-MFEZ Area

The JST received a document “Strategy to deal illegal settlers in the LS-MFEZ” from the MCTI on 8th August 2008. The Local Expert Team would like to apply the Zambian law toward the settlers and seasonal informal farmers in the LS-MFEZ area as the Local Expert Team have been explaining to the JST side as follows:

Step1: Ministry of Tourism, Environment and Natural Resources (MTENR) would serve letters of eviction to the illegal settlers, who would be given thirty days in which to vacate the area;

Step2: Actual physical eviction will be undertaken in accordance with the Zambian Law, Forest Act, Cap 199;

Step3: MCTI will undertake to fence the LS-MFEZ area immediately to ensure no illegal settlers enter and settle in the area;

Step4: Patrols would be undertaken by the Forest Department to deter illegal settlers entering the LS-MFEZ area; and

Step5: MTENR would undertake an inventory of the people in Mahopo settlement.

In the process of evicting the illegal settlers, an inventory would be undertaken and priority would be given to the evicted settlers to be employed during the construction process which is anticipated to start within 2009.

Comments of the JICA Study Team on “Strategy to deal with illegal settlers in the LS-MFEZ”

The JST presented the following comments on “Strategy to deal with illegal settlers in the LS-MFEZ” at the meeting with the Local Expert Team on 14th August 2008. The comments described the JICA guidelines for the Environmental and Social Considerations on the resettlement:

a. A comment on “Justification for eviction”: Which law is applicable?

a1. The LS-MFEZ area was degazetted on 19th October, 2007 (Statutory Instrument No. 82 of 2007) as a Local Forest Reserve.

a2. Part IV Section 24 in Cap 199 of the Forest Act of Zambia had not been applied to the LS-MFEZ area for a long time.

a3. The Lands Act shall be applied to the LS-MFEZ area. Under the Lands Act, a person who is not authorized to the land he/she occupies can be evicted as below.
   - Article 9(1) reads that a person shall not without lawful authority occupy or continue occupy vacant land; and
   - Article 9(2) reads any person who occupies land without authority is liable to be evicted.

b. Minimum requirements:

b1. Implementation of public consultations (explanation to the people affected by the
implementation of the LS-MFEZ project)

b2. Implementation of an identification and socio-economic survey for the target of the involuntary resettlement (only after grasping the situation, the Local Expert Team and the JST can know the target and necessary measures)

b3. Target
- Persons who live in the LS-MFEZ area all year round and don’t have a house outside of the proposed LS-MFEZ area;
- Persons who have a house outside of the proposed LS-MFEZ area and lose income sources or means of livelihood in the proposed LS-MFEZ area.

b4. Preparation of an action plan for involuntary resettlement;

b5. Implementation of involuntary resettlement with providing assistance:
- For persons who want to continue agriculture, the new farmland, which may locate far from Lusaka city, will be provided.
- For persons who want to live near the Lusaka city, job opportunities and job training will be provided.
- It is required to support the people affected by the LS-MFEZ project in restore at least their former living standards, income earning capacity and production levels.

b6. Monitoring of implementation

A summary of the discussion in the meeting is shown below:

- The JST asked the Local Expert Team to reconsider the strategy submitted to the JST on 8th August by applying JICA Guidelines, which was distributed at the meeting. The revised strategy will be ready before the JST comes back in Lusaka in September and the both sides will discuss it.

- The JST asked the Zambian side to stop fencing around the LS-MFEZ area before the both sides agree on a solution how to treat informal farmers and Zambian side agreed.

Though the JST had two meetings with the Local Expert Team on 25th September 2008 and 7th October 2008, the Local Expert Team has not reached the conclusion on “Strategy to deal with illegal settlers in the LS-MFEZ”.

The Local Expert Team continued to propose that the JST should not directly survey for and contact with the illegal settlers and seasonal farmers and should wait the conclusion of this issue presented by the Local Expert Team and discuss on the conclusion with the Local Expert Team.

**Answer of the Local Expert Team on Comments of the JICA Study Team**

The Ministry of Commerce, Trade and Industry (MCTI) responded on the Environmental and Social Considerations on 23rd October 2008 with a letter. Below is the conclusion on “the strategy to deal with illegal settlers in the LS-MFEZ” which was made by the Local Expert Team during a Meeting which was held on 30th September, 2008:

“The Local Expert Team agreed that there was no justification to compensate the illegal seasonal cultivators. This was in line with the Lands Act of 1995 and Forest Act, Cap 199 of the Laws of Zambia, Part IV, Section 24 which states that “it is an offence for any person to enter, settle, cultivate, camp, among others, in a protected area without a licence”. In doing so,
the following steps will be undertaken:

a. Ministry of Tourism, Environment and Natural Resources will deal with the seasonal cultivators until at the time when the area is officially handed over to Ministry of Commerce, Trade and Industry. At the moment, it is prohibited in the area, therefore, that the seasonal cultivators are illegally undertaking farming activities. In this regard, the seasonal cultivators will be evicted in accordance with the laws of Zambia.

b. Regular patrols would undertaken by the Forest Department in conjunction with the Zambia Police to prevent illegal seasonal cultivators from having access to the MFEZ area; and

c. To consolidate the above action, Ministry of Commerce, Trade and Industry will have the MFEZ area fenced.”

The government is preparing an involuntary resettlement area for some projects including the LS-MFEZ project as shown in Figure 10.1.1. The government has expressed the following points:

For the people in Mahopo village as shown in Figure 4.2.2, they can select two options:

a. The place where they live is a part of the Lusaka South Forest Reserve No.26, and the place will be degazetted for the people in the Mahopo village to live as a residence area.

b. If they want to get a farmland, they will be able to move to the resettlement area with loan to construct a house as shown in Figure 10.1.1.

For the other people who settle or are seasonal farmers in the LS-MFEZ area, it is not clear that they can get a farmland in the resettlement area or get a continuous job relating to the LS-MFEZ project.
2) **Counterpart on Environmental and Social Considerations**

The Local Expert Team assigned Mr. W. Sangulube, Chief Extension Officer to be the counterpart who will be liaising with the JICA Study Team on issues to do with environmental and social considerations for smooth preparation of a Strategic Environmental Assessment (SEA). He will be assisted by the Secretariat in carrying out this assignment.

3) **Stakeholder Consultations**

Though the JST has continued to propose to the Local Expert Team that the Stakeholder Consultation should be held, the JST has not got a concrete reply from the Local Expert Team. The JST sent a letter to the Local Expert Team on 22nd September 2008, which described again that:

- The LS-MFEZ project was classified as Category A in the JICA guidelines for the Environmental and Social Considerations.
- A stakeholder consultation for the scoping on the Master Plan of the LS-MFEZ project is necessary process in order to continue to obtain a financial and technical assistance for the LS-MFEZ project from JICA.
- The Local Expert Team would determine to hold the stakeholder consultation for the scoping on the Master Plan of the LS-MFEZ project.
- An outline of the consultation was shown below:
  a. Participants:
    a1. Governmental organizations
      1. Ministry of Commerce, Trade and Industry (MCTI)
      2. Zambia Development Agency (ZDA)
      3. Environmental Council of Zambia (ECZ)
      4. Ministry of Lands (MOL)
      5. Ministry of Local Government and Housing (MLGH)
      6. Zambia Wildlife Authority (ZAWA)
      7. Forest Department
      8. Zambia Air Force (ZAF)
      9. Ministry of Tourism, Environment and Natural Resources (MTENR)
      10. Department of Water Affair (DWA)
      11. Road Development Agency (RDA)
      12. ZESCO
      13. National Council for Construction (NCC)
      14. Zambia Telecommunication Company (ZTC)
      15. Lusaka Water Sewerage Company (LWSC)
      16. Water & Sanitation Working Group
      17. Ministry of Finance and National Planning
      18. Ministry of Education
      19. Ministry of Science, Technology &Vocational Trainings
      20. National Science and Technology Council
      21. National Institute for Scientific and Industrial Research
      22. National Technology Business Center
      23. Technical Education, Vocational and Entrepreneurship Training Authority (TAVETA)

    a2. Local Authorities
      1. Lusaka City Council (LCC)
      2. Lusaka Province Planning Authority
      3. Kafue District Council (KDC)
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4. Chongwe District Council (CDC)
5. Chilenje Ward,
6. Jack Ward
7. John Howard Ward,
8. Chawama Ward
9. Lilayi Ward

a3. Councilors and members of parliament

a4. Representatives from the affected areas/communities
1. Chongwe District
2. Chilenje Ward
3. Jack Ward
4. John Howard Ward
5. Chawama Ward
6. Lilayi Ward
7. Bauleni Compound
8. Informal farmers in LS-MFEZ site

a5. NGOs
1. Chalimbana River Conservation Committee,
2. others

a6. Private Sector

a7. International Organizations/ Donors

a8 Universities and Research Institutions
1. University of Zambia (UNZA)
2. Copperbelt University
3. Evelyn Hone College
4. Zambian Bureau of Standards (ZABS)
5. University Teaching Hospital (UTH)

a9. JICA Study Team

b. Agenda

b1. Backgrounds of the development of LS-MFEZ (MCTI or ZDA)
b2. Presentation on the Concept of Master Plan of LS-MFEZ (JST)
b3. Presentation on SEA, Strategic Environmental Assessment (ECZ)
b4. Presentation on JICA Guideline on environmental and social considerations (JST)
b5. Presentation on the scoping of Master Plan of LS-MFEZ (JST)

The Ministry of Commerce, Trade and Industry (MCTI) responded on the Environmental and Social Considerations on 23rd October 2008 with a letter. In this letter, the Local Expert Team agreed that a schedule of (stakeholder) Meetings will be drafted to meet key stakeholders a list, of which has been attached as shown below:

a. Governmental Organizations
1. Ministry of Commerce, Trade and Industry;
2. Zambia Development Agency;
3. Environmental Council of Zambia;
4. Ministry of Lands;
5. Zambia Wildlife Authority;
6. Ministry of Tourism, Environment and Natural Resource;
7. Ministry of Mines and Minerals Development (Geological Survey Department);
8. Road Development Agency;
10. Zambia Electricity Corporation Limited;
11. Zambia Telecommunications Company Limited;  
12. Lusaka Water and Sewerage Company; and  

b. Local Authority  
   1. Lusaka City Council;  
   2. Lusaka Province Planning Authority  
   3. John Howard Ward;  
   4. Chawama Ward;  
   5. Chilenje Ward; and  


d. Representatives from the affected areas/communities  
   1. Chilenje Ward;  
   2. Jack Ward;  
   3. John Howard Ward;  
   4. Chawama Ward; and  
   5. Informal Farmers in the Lusaka-South MFEZ area.

e. Chalimbana River Conservation Committee

f. Japanese Study Team

The Local Expert Team assigned Mr. W. Sangulube, Chief Extension Officer to be the counterpart who will be liaising with JICA Study Team on issues to do with environmental and social considerations.

The counterpart of the JST on environmental and social considerations told JICA Study Team about carrying out the stakeholder consultations in the following procedures:

a. The Local Expert Team takes the initiative in carrying out stakeholder consultations.

b. Stakeholder consultations will be carried out for individual local stakeholders. Individual stakeholders are as follows:

   - Chalimbana River Conservation Committee (on groundwater issue, refer to the Figure 4.2.2)
   - Zambia Wildlife Authority (on groundwater issue, road issue and so on, refer to the Figure 4.2.2, the management agency of the Lusaka Park)
   - Shantumbu villages (on groundwater issue, refer to the Figure 4.2.2 and section 4.2.2 (2))
   - Mahopo village (on involuntary resettlement issue, refer to the Figure 4.2.2 and section 4.2.2 (2))
   - Illegal cultivators (on involuntary resettlement issue, refer to the Figure 4.2.2 and
section 4.2.2 (2))

- People in the smallholding area (on road issue, directly contact with LS-MFEZ, refer to the Figure 4.2.2 and section 4.2.2 (2))

c. A list of participants and minutes of stakeholder consultation will be provided through the Local Expert Team.

(4) Principle of the Study on Environmental and Social Considerations

The study on environmental and social considerations has been done and will be done according to the draft of scoping. The identification and socio-economic survey is suspended because of the demand of the Local Expert Team.
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10.2 ALTERNATIVES FOR LOCATION

10.2.1 URBAN DEVELOPMENT PLAN OF LUSAKA

The spatial development structure scheme at present is examined and formulated for Greater Lusaka City with satellite towns as shown in Figure 10.2.1 and as described in the progress report of the Study on Comprehensive Urban Development Plan for the City of Lusaka.

![Figure 10.2.1 Spatial Development Concept of Greater Lusaka](image)

Source: Progress Report of the Study on Comprehensive Urban Development Plan for the City of Lusaka in the Republic of Zambia

**Figure 10.2.1 Spatial Development Concept of Greater Lusaka**

Requirements for satellite towns in Greater Lusaka are as follows:

a. The demand of industrial park is estimated at 1,350 ha in 2007 and 3,530 ha in 2030; an increase of 2,180 ha. Each size of 5 industrial parks will be averaged at 436 ha (= 2,180 ha/5).

b. Three phases are planned for Greater Lusaka urban development: phase-1 (to 2015), phase-2 (2020) and phase-3 (2030).

c. Each satellite new town is required to develop the potable water for initial stage; however, the intake from the Kafue River is planned for future stage.

d. Waste water will be not discharged to Lusaka city area, but treated within the each satellite town area because waste water treatment facilities in Lusaka city area will not be able to treat all waste water generated by 5 satellite new towns in early stage.

e. Discharge of storm water is crucial issue for Lusaka city and its center where floods can occur frequently. The storm water will be also considered to discharge within the satellite new town area or to the outside of Greater Lusaka.
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10.2.2 Development Scale in 2030

LS-MFEZ is a multi-facility economic zone and will seek the introduction of all the type of urban functions:

a. Central Business District (CBD)
b. General Industrial Zone (GIZ)
c. High-Tech Park Zone (HTPZ) managed by Private Farms
d. Common Service Facility Zone (CSFZ) managed by Public Sectors
   - Since fundamental industrial ability is not ready, the government strives for building of industrial ability.
   - As governmental support facilities: educational facility (universities, technical schools, vocational training schools, research institute and so on); facilities relevant to industry (industry information center, industrial research institute and so on); public facilities (library, conference hall and so on)
e. Housing Zone (HZ) (high density HZ, low density HZ)
f. Utility Area (sub-station, water supply system, sewerage treatment plant and so on)
g. Roads (trucks, buses, passenger cars, bicycles, pedestrians, green belt)
h. Green Space (Miombo woodland, grass field, park)

Development Scale in 2030 is as follows:

a. Industrial zone (GIZ + HTPZ): 330 ha (Since LS-MFEZ is designed to be a government- supporting industrial zone, the size of industrial zone in the LS-MFEZ area is planned at 330 ha by JST that is 75% of the 436 ha shown in section 10.2.1.
b. Development area (CBZ + GIZ + HTPZ + CSFZ + HZ + Utility Zone): 810 ha
c. Roads: 170 ha
d. Soil treatment area of treated waste water in greenery zone: 50 – 300 ha
e. Minimum development scale (development area + roads + soil treatment area) in 2030: 1030 ha – 1280 ha

10.2.3 Alternative Sites of LS-MFEZ

Alternative sites of LS-MFEZ are selected based on Figure 10.2.1. Since the industrial, logistics and distribution land uses in the East Core will be used by the Chinese MFEZ and air cargo, the area is not considered as an alternative site.

The proposed LS-MFEZ area is named as Candidate site 1 and is shown together with three alternative sites in Figure 10.2.2.
Figure 10.2.2 Four Candidate Sites Proposed by JICA Study Team for LS-MFEZ

Candidate site 1: The LS-MFEZ area proposed by the government of Zambia (South East 15 km from the center of Lusaka city) in the South-East Core as shown in Figure 4.2.2.

Candidate site 2: West of current industrial zone (West of the Lusaka railway station) in the West Core. Candidate sites 2-1 and 2-2 are shown in Figure 10.2.3.

Candidate site 3: North side of Lusaka city (along the international road, Great North Road) in the North Core. Candidate site 3 is shown in Figure 10.2.4.

Candidate site 4: South side of Lusaka city (along the international road, Kafue Road) in the South Core. Candidate sites 4-1 and 4.2 are shown in Figure 10.2.5.
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Figure 10.2.3 Candidate Sites 2-1 and 2-2

Figure 10.2.4 Candidate Site 3
10.2.4 Characteristics of Candidate Sites

The characteristics of Candidate Sites are shown in Table 10.2.1.

Table 10.2.1 Characteristics of Four Candidate Sites Proposed by JICA Study Team for LS-MFEZ

<table>
<thead>
<tr>
<th>Item</th>
<th>Candidate Site 1</th>
<th>Candidate Site 2</th>
<th>Candidate Site 3</th>
<th>Candidate Site 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land owner</td>
<td>Government</td>
<td>Private lands</td>
<td>Private lands</td>
<td>Private lands</td>
</tr>
<tr>
<td>Access Road</td>
<td>Leopard Hill Road</td>
<td>Mungwi Road, Mumbwa Road, G. North Road</td>
<td>G. North Road, G. East Road</td>
<td>Kafue Road</td>
</tr>
<tr>
<td>Railway</td>
<td>11 km from the railway</td>
<td>The east side of this site adjoins the railway.</td>
<td>5 km from railway</td>
<td>5 km from the railway</td>
</tr>
<tr>
<td>Airport</td>
<td>20 km</td>
<td>25 km</td>
<td>20 km</td>
<td>30 km</td>
</tr>
<tr>
<td>Water Supply and Sewerage</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Power Supply</td>
<td>It is necessary to draw a power line from substation.</td>
<td>It is necessary to draw a power line from substation.</td>
<td>It is necessary to draw a power line from substation.</td>
<td>It is necessary to draw a power line from substation.</td>
</tr>
<tr>
<td>Type of Industrial Zone</td>
<td>Urban and eco-friendly type</td>
<td>Expanded type of existing heavy and</td>
<td>Road and railway location type and</td>
<td>Road and railway location type and</td>
</tr>
</tbody>
</table>


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### 10.2.5 Comparison of Candidate Sites

Candidate sites are compared in Table 10.2.2.

#### Table 10.2.2 Comparison Table of Candidate Sites

<table>
<thead>
<tr>
<th>Item</th>
<th>Candidate Site 1</th>
<th>Candidate Site 2</th>
<th>Candidate Site 3</th>
<th>Candidate Site 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly processing type products</td>
<td>light industries and urban type</td>
<td>urban type</td>
<td>urban type</td>
<td></td>
</tr>
<tr>
<td>Geology (Refer to Figure 6.7.1)</td>
<td>Dolomite (carbonate rock)</td>
<td>Dolomite (carbonate rock)</td>
<td>Dolomite (carbonate rock), scist</td>
<td>Dolomite (carbonate rock), scist</td>
</tr>
<tr>
<td>Land Use</td>
<td>Land was officially used as forest, but will be as industry.</td>
<td>State house and several houses along Mungwi and Mumbwa Roads</td>
<td>Small-scale farmhouses are distributing.</td>
<td>Places of houses are separated from the large-scale of farms.</td>
</tr>
<tr>
<td>Residence</td>
<td>Associated huts or small houses of informal farmers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surounding Settlements</td>
<td>Chilenje Bauleni, Lilayi</td>
<td>Kanyama</td>
<td>Chazanga</td>
<td>Chilenga</td>
</tr>
<tr>
<td>Environmental Condition</td>
<td></td>
<td>Quarry is performed along Mungwi Road. The land is covered with the grassland with bushes.</td>
<td>Small scale farmers cultivate maize, trees dispersed in the farmlands.</td>
<td>Large scale farmers cultivate maize. Woodlands separate the farmlands.</td>
</tr>
</tbody>
</table>

### Land Acquisition (For expropriating lands of which usufruct is in a private sector on a large scale, the Zambia government is negative.) (Pre-construction stage)

- Candidate Site 1: The land is under control of the government, and does not newly need to be acquired. Cultivation, quarry, firewood collection, etc. are performed illegally.  
  - Cost: Low (+); Time: Short (+); Social: (+)

- Candidate Site 2: The usufruct is in a private sector, and time and cost are consumed when expropriating the land. Quarry is performed along Mungwi Road. There are many unused lands.  
  - Cost: High (-); Time: Long (-); Social: (-)

- Candidate Site 3: The usufruct is in a private sector, and time and cost are consumed when expropriating the land. There are many small and middle holders and it is difficult to find an alternative land on the same conditions (agriculture in the Lusaka suburbs).  
  - Cost: High (-); Time: Long (-); Social: (-)

- Candidate Site 4: The usufruct is in a private sector, and time and cost are consumed when expropriating the land. There are middle and large holders and it is difficult to find an alternative farm land on the same conditions (agriculture in the Lusaka suburbs).  
  - Cost: High (-); Time: Long (-); Social: (-)

### Involuntary Resettlement (Pre-construction stage)

- Candidate Site 1: There are persons who illegally produce maize, mine stone and sand and collect firewood in Candidate 1. The number and socio-economic condition of informal settlers who live in Candidate Site 1 and those of informal farmers who seasonally cultivate in Candidate Site 1 shall be surveyed.  
- Candidate Site 2: The number of houses and buildings, which are located in Candidate Site 2-1, is estimated to be 100 in 1,300 ha. These houses are located along the Mungwi and Mumbwa roads. Candidate Site 2-2 has farm lands and houses along the Mungwi and Mumbwa roads. The number of houses and  
- Candidate Site 3: If the required development area is 1,300 ha in Candidate Site 3, the number of houses and buildings which are located is estimated to be 65.  
  - Cost: High (-); Time: Long (-); Social: high (-)

- Candidate Site 4: If required development area is 1,300 ha, the number of affected houses is estimated to be 100 for Candidate Site 4-1 and 50 for Candidate Site 4-2. Agricultural workers will also be affected.  
  - Cost: High (-); Time: Long (-); Social: high (-)
<table>
<thead>
<tr>
<th>Item</th>
<th>Candidate Site 1</th>
<th>Candidate Site 2</th>
<th>Candidate Site 3</th>
<th>Candidate Site 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Livelihood, Poverty</strong>&lt;br&gt;(Pre-construction stage)</td>
<td>There are persons who grow maize and/or mine stones. The ratio of income obtained in the LS-MFEZ per total income depends on the person. However since open space which is not controlled is decreasing near Lusaka, it is difficult for these persons to continue to get livelihood as present. Social: high(-)</td>
<td>Impact is great if equivalent farmland and/or house are not able to be found. Social: high (-)</td>
<td>Impact is great if equivalent farmland and/or house are not able to be found. Social: high (-)</td>
<td>Impact is great if equivalent farmland and/or house are not able to be found. Social: high (-)</td>
</tr>
<tr>
<td><strong>Utilization of groundwater</strong>&lt;br&gt;(Operation stage)</td>
<td>Since the groundwater can be pumped in the south area of groundwater watershed, the groundwater of Lusaka is not affected. It is possible to affect to Shantumbu villages. Cost: high (-) Social: middle (0)</td>
<td>Use of groundwater in this site affects groundwater of an adjoining industrial area and Lusaka Central. There is possibility of contamination of groundwater from the industrial area. Cost: high (-) Social: high (-)</td>
<td>Use of groundwater in this site affects groundwater of an adjoining agricultural area. Cost: middle (0) Social: middle (0)</td>
<td>In Candidate Site 4-1 irrigation well of middle and large holders who would be replaced can be used. No negative impact. Cost: small (+) Social: small (+)</td>
</tr>
<tr>
<td><strong>Waste water treatment facility</strong>&lt;br&gt;(It is difficult to select a higher technical method than stabilization pond method because of maintenance and unstable electric power supply)</td>
<td>It is not connectable with the sewerage system of Lusaka. There is also no river which can be discharged. As for treated wastewater, organic components are decomposed and nutritional components are removed with infiltration in soil. There is sufficient area for the soil treatment of treated wastewater. Cost: middle (0) Maintenance: difficult(-) Groundwater recharge area: (-)</td>
<td>It may be connectable with the sewerage system of Lusaka. There is also no river which can be discharged. As for treated wastewater, organic components are decomposed and nutritional components are removed with infiltration in soil. There is sufficient area for the soil treatment of treated wastewater. Cost: middle (0) Maintenance: difficult(-) Groundwater recharge area: (-)</td>
<td>It is not connectable with the sewerage system of Lusaka. The treated wastewater may be discharged to Chunga River. If it is not, it is necessary to acquire the suitable land for soil treatment of treated wastewater. However Chunga River is already contaminated with the treated wastewater of Lusaka City. Cost: middle (0) Maintenance: difficult(-) Groundwater recharge area: (-)</td>
<td>It is not connectable with the sewerage system of Lusaka. There is also no river which can be discharged. As for treated wastewater, organic components are decomposed and nutritional components are removed with infiltration in soil. It is necessary to acquire the land for soil treatment of treated wastewater. Cost: Large (-) Maintenance: difficult(-) Groundwater recharge area: (-)</td>
</tr>
<tr>
<td><strong>Drainage of storm water</strong>&lt;br&gt;(Operation stage)</td>
<td>Since the storm water drainage system of Lusaka is not enough, storm water will be made to infiltrate in this site. There is enough area for storm water to infiltrate. Cost: Low (+) En and Soc Impact: Low (+)</td>
<td>Since the groundwater level is close to surface of the earth, also in the present, it is a way in the rainy season as storm water. The tendency becomes strong with project implementation. It may have impact of a flood on surroundings. Cost: High (-) En and Soc Impact: High (-)</td>
<td>The north side of this site may be affected. Cost: High (-) En and Soc Impact: High (-)</td>
<td>The south side of this site may be affected. Cost: High (-) En and Soc Impact: High (-)</td>
</tr>
<tr>
<td><strong>Contamination of soil and water</strong>&lt;br&gt;(Operation stages)</td>
<td>If sewerage treatment system does not function well, it leads to contamination of soil and groundwater. Environmental impact: Large (-)</td>
<td>If sewerage treatment system does not function well, it leads to contamination of soil and groundwater. Environmental impact: Large (-)</td>
<td>If sewerage treatment system does not function well, it leads to contamination of Chunga River or soil and groundwater. Environmental impact: Large (-)</td>
<td>If sewerage treatment system does not function well, it leads to contamination of soil and groundwater. Environmental impact: Large (-)</td>
</tr>
</tbody>
</table>
Candidate Site 1 is chosen as the area for master plan study from the following points of view:

a. The Zambia government shows the plan which will change the industry into a diversified structure from monoculture as soon as possible. The Candidate Site 1, which the government has proposed, is the land controlled by the government. Therefore, the land acquisition of the Candidate Site 1 is much less difficult than those of other Candidate Sites from the viewpoint of time and cost, and the Candidate Site 1 is suitable for a MFEZ led by the government.

b. Since the Candidate Site 1 is a larger land than other Candidate Sites, the Candidate Site 1 is suitable for a MFEZ including various functions, especially Common Service Facility Zone (CSFZ) managed by Public Sectors (educational facilities (universities, technical schools, vocational training schools, research institute and so on); facilities relevant to industry (industry information center, industrial research institute and so on); public facilities (library, conference hall and so on)) and will be able to bear a part of diversified functions which the Lusaka central part has.

c. Since there are a variety of settlements (low income area: Bauleni; middle income area: Chilenje; high income area: Woodlands extension) near Candidate Site 1, it is easy to get a variety of workers if vocational training is added as a programme.

d. Although the trunk road network in Lusaka consists of radial roads, ring roads will be added to the trunk road network in order to dissolve traffic congestion. In any Candidate Sites, public transports will become better with the trunk ring roads.

e. For the sewerage treatment and drainage of storm water, Candidate Site 1 can prepare land more enough than other Candidate Sites to select one from a variety of methods.

f. Since Candidate Site 1 is large, restoration of woodland can be planned in parallel with development.


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10.3 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS IN THE BEGINNING OF THE SECOND FIELD STAGE

10.3.1 ENVIRONMENTAL ELEMENTS

The environmental elements to be assessed cover the elements of social environment, natural environment and public hazardous elements, respectively as listed below:

a. Social Environment includes: (i) involuntary resettlement, (ii) land acquisition, (iii) impact on livelihood and local economy, (iv) poverty, (v) change in land use, (vi) split of community, (vii) water right and right of common, (viii) water use and (ix) hazard risk

b. Natural Environment includes: (i) groundwater, (ii) soil erosion, (iii) fauna, flora and ecological diversity

c. Public Hazardous Element includes: (i) air pollution, (ii) water pollution, (iii) soil pollution, (iv) wastes, (v) noise and vibration and (vi) subsidence

10.3.2 EVALUATION RESULTS

In the beginning of the second field stage, even rough plans for the size of MFEZ, zoning of MFEZ area, the kind of the companies and organisations which move in, infrastructures and so on, are not yet prepared. Impacts produced by LS-MFEZ implementation, and evaluation of the impacts, which are shown in Table 6.7.4 were estimated on the condition that factories in the industrial area near the central part of Lusaka would be installed in the proposed LS-MFEZ area. Mitigation measures for impacts are also shown in Table 10.3.1.

### Table 10.3.1 Evaluation Results in the Beginning of the Second Field Stage

<table>
<thead>
<tr>
<th>Social Environment</th>
<th>Impacts when not taking special mitigation measures</th>
<th>Evaluation</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involuntary resettlement</td>
<td>- Associated huts are located in the proposed LS-MFEZ area. Removal or relocation of huts is required. - There is possibility of relocation of houses in construction of access roads.</td>
<td>B (-)</td>
<td>Based on the result of specific survey of people who are working informally, mitigation measures will be studied.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B (-)</td>
<td>A route is adjusted so that houses will not be located on the route as much as possible.</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th></th>
<th>Impacts when not taking special mitigation measures</th>
<th>Evaluation</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Land acquisition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|   | - Land of 2100 ha is secured. Since it is government land, it is does not require land acquisition.  
   - Land acquisition is necessary only for construction of access roads. | D          | B (-) The intention to choose sale or substitute land will be asked of those who’s land is to be acquired. Substitute land will be secured in the area which adjoins the site when possible. |
| 3 | Livelihood and Local Economy                       | A (+)      |                     |
|   | - The income of those who are working informally (farming, charcoal production, quarrying and sand mining) will be reduced. |            | Based on the result of specific survey of people who are working informally, mitigation measures will be studied. Stakeholder consultation will be carried out and adjustment of opinions sought. Since those who are farming informally are mainly performing burnt field farming, when substitute land will be considered, it will be necessary to change their farming method. Construction works will be offered during the construction phase and various kinds of other works will be offered during the operation phase. Employment will occur in the vegetation recovery work in the LS-MFEZ area. |
|   | - Since employment will increase, the project has positive impact for regional economy.  
   - In connection with constructing roads, the economy of the area will be stimulated. | A (+)      |                     |
|   |                                                   | B (+)      |                     |
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<table>
<thead>
<tr>
<th></th>
<th>Impacts when not taking special mitigation measures</th>
<th>Evaluation</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Poverty</td>
<td>A (-)</td>
<td>Based on the result of specific survey of people who are working informally, mitigation measures will be studied. Stakeholder consultation will be carried out and adjustment of opinions sought. Since those who are farming informally are mainly performing burnt field farming, when substitute land will be considered, it will be necessary to change the farming method. Construction works will be offered during the construction phase and various kinds of other works will be offered during the operation phase. Employment will occur in the vegetation recovery work in the LS-MFEZ area.</td>
</tr>
<tr>
<td>5</td>
<td>Land Use</td>
<td>B (-)</td>
<td>The proposed LS-MFEZ area is flat or has low inclination as a whole, so re-vegetation in industrial and research lots will be carried out with low height grass in order to maintain the ecological function of vegetation and soil as much as possible. Surroundings of sites which have concern regarding the stability of the ground or a sinkhole are to be protected with suitable vegetation. Function of land as a water recharging area for groundwater will be maintained or recovered with suitable vegetation before the development.</td>
</tr>
<tr>
<td>6</td>
<td>Split of community</td>
<td>B (+)</td>
<td>Stakeholder consultation will be held and mitigation measures and monitoring programme for negative impacts will be discussed.</td>
</tr>
<tr>
<td>7</td>
<td>Water right and common rights</td>
<td>A (+)</td>
<td>Stakeholder consultation will be held and mitigation measures and monitoring programme for negative impacts will be discussed.</td>
</tr>
</tbody>
</table>

- Informal economic activities (farming, charcoal production, quarrying and sand mining in the proposed MFEZ site) will not be continued. The possibility that poor persons are performing the informal economic activities is high.

A part of grassland with shrubs will be changed to industrial and research lots. The coverage ratio of vegetation will decrease and the function of water recharging for groundwater may decrease.

Since access roads and roads in the proposed LS-MFEZ area will be constructed, public transport will become more convenient.

The Chalimbana River Catchment Association and others have vested rights for the use of groundwater and streams. If LS-MFEZ will use the groundwater, some conflicts with stakeholders will be generated.
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<table>
<thead>
<tr>
<th>Impact Area</th>
<th>Impacts when not taking special mitigation measures</th>
<th>Evaluation</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8 Water use</strong></td>
<td>On the water supply from the Kafue River, the Lusaka Water Sewerage Company (LWSC) is asking other stakeholders for increase of the framework of water rights. Even though LS-MFEZ will use water within the framework of LWSC, LS-MFEZ may conflict with stakeholders using the water of LWSC.</td>
<td>B (-)</td>
<td>The LS-MFEZ side should clarify the amount of water consumption and should talk with LWSC.</td>
</tr>
</tbody>
</table>
| **9 Hazards (Risk)** | - Since the bedrock is dolomite, there is the possibility of subsidence according to the erosion level of bedrock.  
- The flow of rain water may change and a disaster may be caused.  
- The ground may be weakened after constructing roads and buildings. | A (-) | Sufficient investigation will be carried out when building each facility. Low layer facilities should be considered.  
A (-) | The part, which became vulnerable with karstification, should be protected with vegetation and should not be used for development. For the part on which structures are built, a storm drainage system should be prepared also to consider downstream regions.  
A (-) | A monitoring method with which weakened ground is detected should be studied. |
| **10 Soil erosion** | - In the part to which coverage ratio of vegetation is reduced with construction, the possibility of soil erosion may increase.  
- Impact is great although places for quarrying and sand mining for construction work is undecided. | A (-) | Vegetation is to be restored. If it is difficult to prevent soil erosion with vegetation, soil will be protected with artificial methods.  
A (-) | According to the situation of quarrying and sand mining places, mitigation measures will be implemented at the proposed quarrying and sand mining places. |
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<tbody>
<tr>
<td>11</td>
<td>If the LS-MFEZ uses much groundwater, other groundwater and surface water users may be affected.</td>
<td>A (-)</td>
<td>Although water will be eventually supplied from the Kafue River, only groundwater can be used in the early stage of the project operation. The case where the amount of the water used must be rationed may arise. In such a case, companies and facilities for research which are introduced will not consume industrial water. In order to suppress consumption of domestic water, the nighttime population (residents) will be restricted and biotoilets may be also used for the treatment of human excrement.</td>
</tr>
<tr>
<td>12</td>
<td>When roads and facilities are constructed, trees will be cut down and vegetation will be removed.</td>
<td>A (-)</td>
<td>The part, which became vulnerable with karstification, should be protected with vegetation and should not be used for development. Re-vegetation in facility sites will be also carried out with low height indigenous grass. A botanical garden for research with endemic species of this area will be prepared, and the possibility of industry using botanical resources will be also studied.</td>
</tr>
<tr>
<td>13</td>
<td>- Air pollution will increase due to construction machinery and traffic during construction phase.</td>
<td>B (-)</td>
<td>Construction machines and vehicles with low contamination will be used as much as possible.</td>
</tr>
<tr>
<td></td>
<td>- During the operation phase, air pollution will increase with increase of traffic. Although introduced factories will at least follow the emission standard, air pollution will increase.</td>
<td>B (-)</td>
<td>As a traffic system, bicycles will be used together with cars and load of air pollution will be reduced. Fundamentally, companies and research institutions with less emission of air pollutants will be invited preferentially.</td>
</tr>
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<tr>
<td>14</td>
<td><strong>Water pollution</strong>&lt;br&gt;- The possibility of water pollution will increase with the increase of construction work and traffic. Moreover, there is possibility of water contamination with toilets and domestic wastewater.&lt;br&gt;- Water pollution will increase with increase of traffic during the operation phase.</td>
<td>A (-)</td>
<td>Waste oil, wastes, wastewater and so on will be sufficiently controlled. Human excrement will be stored in a toilet without a leakage and be carried to the wastewater treatment facility in Lusaka in a timely manner.</td>
</tr>
<tr>
<td></td>
<td><strong>Water pollution</strong>&lt;br&gt;- Domestic and industrial wastewater will be generated, which will cause water pollution.</td>
<td>A (+)</td>
<td>Companies and facilities for research which generate less industrial wastewater (for example they don’t use industrial water or they have a reuse system for industrial water) will be introduced preferentially. A suitable industrial wastewater treatment facility will be constructed for each zone in order to reduce the water pollution as much as possible. The nighttime population (residents) will be restricted, and the generation of domestic wastewater will be reduced. A suitable domestic wastewater treatment facility will be constructed for each zone in order to reduce the water pollution as much as possible.</td>
</tr>
<tr>
<td>15</td>
<td><strong>Soil pollution</strong>&lt;br&gt;- The possibility of soil pollution will increase with the increase of construction work and traffic. Moreover, there is possibility of soil contamination with toilets and domestic wastewater.&lt;br&gt;- There is possibility of soil pollution by exhaust gas from vehicles and production units, domestic and industrial wastewater, wastes and so on.</td>
<td>B (-)</td>
<td>Waste oil, wastes, toilets, wastewater and so on will be sufficiently controlled.</td>
</tr>
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</table>
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<tr>
<td>16</td>
<td>Wastes</td>
<td>B (-)</td>
<td>According to regulations, wastes will be disposed appropriately. Surface soil will be stored during the construction or will be used for restoration of vegetation in the LS-MFEZ area. Construction surplus soil will be used for restoration of the part of LS-MFEZ area where soil and sand were lost before. Waste will be reduced with the various methods such as recycling, reuse, detoxication in principle. Domestic wastes will be disposed of in the final disposal site in Lusaka.</td>
</tr>
<tr>
<td>16</td>
<td>Wastes</td>
<td>A (+)</td>
<td>Industrial wastes will be disposed of in a stable disposal site in Lusaka if this is possible. If not possible, a disposal site will be studied inside or outside of LS-MFEZ area. Activated sludge which is generated in the process of the domestic wastewater treatment will be composted and its safety improved. The product will be used as a fertilizer. Sludge and solid waste generated from the process of industrial wastewater treatment will be sealed and stored in a special facility for hazardous wastes which are not recyclable.</td>
</tr>
<tr>
<td>17</td>
<td>Noise/vibration</td>
<td>B (-)</td>
<td>The area with marked weathering should be avoided for development. If a weathered area must be developed, the construction method will be studied in detail beforehand.</td>
</tr>
<tr>
<td>17</td>
<td>Noise/vibration</td>
<td>B (-)</td>
<td>Mitigation measures which reduce noise and vibration will be taken as necessary.</td>
</tr>
</tbody>
</table>

- Waste oil, construction wastes, construction surplus soil and so on, will be generated during the construction phase.

- Various kinds of domestic and industrial waste will be generated during the operation phase.

- Although noise and vibration occur during the construction phase, since there is no habitable area in the LS-MFEZ, so impact will be small. However, the base rock is a dolomite stratum. If a part of base rock is weathered, the part may be affected by vibration.

- Marked noise and vibration will occur depending on a type of industry.
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#### 10.3.3 Basic Principles for Environmental and Social Considerations during the Preparation of Master Plan

There are problems common to many newly developed areas such as the proposed LS-MFEZ area in the outskirts of Lusaka. In order to solve the problems already pointed out in the proposed LS-MFEZ area, basic principles for environmental and social considerations in the preparation stage of master plan are summarised below:

1. **Geology and Base Rock**
   a. Because the bedrock is dolomite, places with a depression structure or a sink hole will not be developed and will be appropriately protected with indigenous plant species. 1/5000 of topographical maps for the proposed LS-MFEZ area will be prepared using satellite data. It is planned to extract geographical features judged to be depression structures at the proposed LS-MFEZ area. Geographical features will be checked by a field survey. Facilities, roads and sewerage system which may cause contamination in cases of accident will in principle not be installed near such places. Moreover, a monitoring system which checks amount of water (or water level) and water quality at observation wells and streams will be prepared.
   
   b. It is necessary to survey the geology and the ground for places where facilities and structures of LC-MFEZ would be installed to clarify lots which can be used. Local vegetation such as low-height grass should be planted around the facilities and the structures of LS-MFEZ. Unstable points found in the ground survey will be protected with vegetation.
   
   c. Since the bedrock is a dolomite stratum, it is necessary to consider the construction method of facilities and structures of MFEZ.
   
   d. In order to avoid being anxious where the ground may not be stable, the ground condition will be carefully analysed before route planning of a road network and an appropriate construction method will be planned.

2. **Water Supply**
   a. Since the start time of water supply from the Kafue River is not clear, groundwater will be used in an early stage of development.
   
   b. If groundwater will be pumped up in the proposed LS-MFEZ area, it is necessary to determine a pumping rate so that the use of groundwater will not affect the southern
and eastern part of Lusaka, the Lusaka Park and Shantumbu village which are located at the south of Lusaka Park.

c. Since Lusaka is located 300 m higher than the Kafue River the cost for water supply will become high. The construction cost of a water purification plant, pumping stations and a pipeline and so on should be prepared. But anyway, it is necessary to reduce the amount of water consumption.

d. A monitoring system of the water level of groundwater at an observation well and the water level of stream at the observation site, will be prepared.

(3) Sewerage System, Treatment of Waste Water and Discharge of Treated Waste Water

a. Companies and research institutes which will be installed in the proposed LS-MFEZ area will have restrictions on use of water, treatment of the domestic and industrial wastewater and discharge of treated wastewater.

b. Priority will be given to companies and research institutes which do not much use industrial water or which can recirculate industrial water (that is, treat wastewater and reuse treated wastewater) to reduce the industrial wastewater. Since each type of industrial wastewater contains characteristic contaminants, the treatment of wastewater at the source is generally desirable. If reuse of water or materials is possible by using clean production techniques, there may be the possibility of cost reduction. Surplus treated wastewater will be treated further in a special treatment facility and twice-treated wastewater will be reused in companies and research institutes as industrial water or will be discharged into a suitable discharge place if its quality fulfills the criteria for reusing or discharging the treated wastewater. The criteria will be described in the preparation phase of the master plan.

c. Since the bedrock is a dolomite (carbonate) stratum and wastewater may pollute the groundwater if it leaks from the sewerage system, the wastewater with high concentration of toxic contaminants will not be discharged into the sewerage system.

d. Wastewater with high toxic pollutant concentration and sludge generated in the process of industrial wastewater treatment will be solidified, sealed and stored in a special waste treatment facility.

e. If the quantity of water supply and quantity of treated wastewater discharge have restrictions, living accommodations for companies and research institutes will be restricted to a necessary minimum.

f. A monitoring system, which observes the quality of groundwater at an observation well or the quality of stream water at an observation site, will be prepared.

(4) Informal Farmers in the Proposed LS-MFEZ Area

In the proposed LS-MFEZ area, there are those who are illegally cultivating maize, quarrying, mining sand and collecting firewood. There are associated huts or small houses in the proposed LS-MFEZ area.
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The Zambian Government’s view on this matter is as follows:

- The LS-MFEZ area was previously a gazetted forest area and it belonged to the Zambian government. By law, no person was allowed to settle and live in a gazetted forest.

- Over the years, the trees in this forest were depleted by illegal loggers to produce charcoal. By the time government took the decision to reserve this area for the LS-MFEZ, all the trees were depleted other than small bushes.

- Even after this area was de-forested, there was no human settlement in this forest area. Several officers have visited the area before and are satisfied themselves that there was no human settlement in the area.

- Some parts of the designated LS-MFEZ area get farmed during the rainy season to produce maize. The people who get these peoples’ livelihood are not farming. They have their own livelihoods except farming but they take advantage of the open spaces around the city to grow maize. This practice is not unique to the LS-MFEZ area. It happens in many other areas of Lusaka and other towns. Such farmers cease their activities once development on the land starts.

- It was therefore quite surprising to the government team to learn from the JICA study team that LS-MFEZ area is a home to 1,300 farmers, some of who have “houses” there. They can only assume that what is happening is the result of a common observation made on human behaviour on space that they know is about to be developed. In Zambia and other developing areas, settlers tend to quickly congregate around the area designated for development in the hope of receiving compensation from the developers.

- Zambian Government requests that the LS-MFEZ JICA study team takes extreme care in assessing claims of livelihoods dependent on the LS-MFEZ area.

- Regarding the issue of seasonal farming by people in the surrounding area, measures are being put in place, that is, the proposed LS-MFEZ area will be fenced.

JICA study team (JST) explained the World Bank Operational Policy on Involuntary Resettlement and JICA’s Guidelines for Environmental and Social Considerations to the Local Expert Team. According to the World Bank Operational Policy on Involuntary Resettlement, it is pointed out that

a. The policy is triggered not only by physical relocation caused by the project but by any loss of land or other assets resulting in:
   · relocation or loss of shelter;
   · loss of assets or access to assets; or
   · loss of income sources or means of livelihood, whether or not the affected people must move to another location.

b. The objectives of the resettlement policy are to:
· avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs
· assist the displaced in improving their former living standards, income earning capacity, and production levels, or at least in restoring them;
· provide assistance to affected people regardless of the legality of land tenure.

Not only squatters but also seasonal farmers in the proposed LS-MFEZ are affected people to participate in planning and implementing resettlement and to receive assistance regardless of the legality of land tenure.

JICA’s Guidelines for Environmental and Social Considerations is the same as the World Bank’s Policy in this point.

And JST explained that if the LS-MFEZ area would be fenced without a consultation with the squatters including seasonal farmers, this action would not accord with the international guidelines. This would be caused to difficulty of obtaining the technical and financial support from the international donors.

JST will continue to discuss on informal farmers with the Local Expert Team.