ZAMBIA

Report of the
Study on National Development

-Growth Center in the Southern Africa-

March 2006

Engineering and Consulting Firms Association (ECFA),
Japan
Zambia and its neighbors in Africa

GDP (billion)

Sources: World Development Indicators (2004)

GNI/capta($)

Sources: World Development Indicators (2004)
Sources: World Development Indicators (2004)
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AfDB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>ADFSSP</td>
<td>Agricultural Development &amp; Food Security Support Program</td>
</tr>
<tr>
<td>BOP</td>
<td>Balance of Payments</td>
</tr>
<tr>
<td>CAS</td>
<td>Country Assistance Strategy</td>
</tr>
<tr>
<td>COMESA</td>
<td>Common Market for Eastern &amp; Southern Africa</td>
</tr>
<tr>
<td>CSO</td>
<td>Central Statistics Office</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development</td>
</tr>
<tr>
<td>DRC</td>
<td>Democratic Republic of the Congo</td>
</tr>
<tr>
<td>DoCIP</td>
<td>Donor Coordination in Practice</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EPZ</td>
<td>Export Processing Zone</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FA0</td>
<td>Food and Agriculture Organization</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>FIAS</td>
<td>Foreign Investment Advisory Service</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross National Income</td>
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<tr>
<td>HIPC</td>
<td>Heavily Indebted Poor Countries</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Human Immunodeficiency Virus Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>IBRD</td>
<td>International Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>IDA</td>
<td>International Development Association</td>
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<tr>
<td>IFC</td>
<td>International Finance Corporation</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>I-PRSP</td>
<td>Interim Poverty Reduction Strategy Paper</td>
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<tr>
<td>JICA</td>
<td>Japan International Cooperation Agency</td>
</tr>
<tr>
<td>JSA</td>
<td>Joint Staff Assessment</td>
</tr>
<tr>
<td>KCM</td>
<td>Konkola Copper Mines</td>
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<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
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<tr>
<td>MoFNP</td>
<td>Ministry of Finance and National Planning</td>
</tr>
<tr>
<td>NCP</td>
<td>National Council on Privatization</td>
</tr>
<tr>
<td>NEPAD</td>
<td>New Partnership for African Development</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>ODA</td>
<td>Official Development Assistance</td>
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<tr>
<td>PRSC</td>
<td>Poverty Reduction Support Credit</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>PRGF</td>
<td>Poverty Reduction and Growth Facility</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
</tr>
<tr>
<td>PSD</td>
<td>Private Sector Development</td>
</tr>
<tr>
<td>ROADSIP</td>
<td>Road Sector Investment Program</td>
</tr>
<tr>
<td>RRMP</td>
<td>Road Rehabilitation and Maintenance Project</td>
</tr>
<tr>
<td>SAC</td>
<td>Structural Adjustment Credit</td>
</tr>
<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
</tr>
<tr>
<td>SAPP</td>
<td>Southern African Power Pool</td>
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<tr>
<td>SEED</td>
<td>Support to Economic Expansion and Diversification</td>
</tr>
<tr>
<td>SWAP</td>
<td>Sector Wide Approach</td>
</tr>
<tr>
<td>SWSW</td>
<td>Support to Water Sector Reform Project</td>
</tr>
<tr>
<td>TAZAMA</td>
<td>Tanzania/Zambia Pipeline</td>
</tr>
<tr>
<td>TEVET</td>
<td>Technical Education, Vocational, and Entrepreneurship Training</td>
</tr>
<tr>
<td>TNDP</td>
<td>Transitional National Development Plan</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
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</tbody>
</table>
Lusaka Railway Station

Proposed site for Kazungula Bridge

Market at “Compound” near Lusaka
World-Famous Victoria Fall

Large-scale Food Processing Factory

Electricity sub-station at industrial area
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Chapter 1

Introduction
Chapter 1  Introduction

At the event of the recent G8 Summit the Prime Minister Koizumi expressed a strong message to Africa that Japan would strive to realize a strategic expansion of its ODA volume by US$10 billion over the next five years and, in particular, Japan would double its Official Development Assistance (ODA) to Africa in the next three years. Soon after this speech, debt cancellations of US$4.9 billion for Heavily Indebted Poor Countries (HIPCs) in Africa was undertaken at the largest scale among all creditor countries.

In response to Mr. Koizumi’s speech, we, the Engineering Consulting Firms Association (ECFA), dispatched the ECFA Mission to Zambia in order to enlarge Japan’s technical and financial assistance to Africa. The Mission visited Zambia between 10th and 20th February, 2006 and had a series of useful discussions and meetings with the relevant ministries in Lusaka. The Mission comprises multi-sector experts as follows;

- MR. Hisashi TAKANASHI, Mission leader, economist
- MR. Takeharu KOBA, transport planner
- MR. Kazunori INOUE, electricity expert
- MR. Jiro AZUHATA, water supply and sewerage engineer
- MR. Takao KUME, agriculture and water resource expert
- MR. Kiyoshi SAKAI, industrial and foreign investment expert

The Mission was aimed at the following tasks;

1) To review the present conditions of economic and social development,
2) To assess the current constraints and development potentials in five major sectors (i. transport, ii. agriculture, iii power iv. water supply and sewerage, v. industries and foreign investment),
3) To suggest the development strategies, and
4) To propose appropriate projects identified to meet the local requirements.

This report has been prepared to present the findings of the said ECFA study Mission. It contains five chapters: Chapter one is introduction; chapter two is overview of present status of economy and social situations; Chapter three proposes national level development strategies; Chapter four describes sector issues and constraints and thereby suggests development strategies by sector; and Chapter five compiles a list of appropriate development projects formulated during the field survey.
Zambia is a rich country with mining reserves, agricultural land and water resources. In particular, copper production has been spearheading economic growth as production volumes have almost doubled and international prices have sharply risen. Mining sector thus contributed greatly to recent high economic performance. Nevertheless it is said that these mining sector expansions have not translated significantly into reductions in poverty. It is because mining sector growth has been driven by capital-intensive method rather than labor-intensive method, which has not unfortunately brought about enough employment and income generation opportunities to the population. Agriculture sector has achieved steady growth, but faced vulnerabilities to the vagaries of the weather, limited infrastructure and poor marketing access. Facilitation of irrigation infrastructure development has been of urgent need. Zambia possesses abundant water resources such as Kafue River Zambezi River, of which hydropower potential would be huge. South Africa, which is a largest power consuming country in the region, requires long-term supply of electricity in the neighborhood. Grand design of hydropower development in Zambia would be necessary.

In view of these challenges, the present report would provide the bases for improving the situations and suggest directions for promoting Japan’s assistance to Zambia in terms of implementation of specific projects.

In conclusion, the ECFA Mission would like to express its sincere appreciation to Zambian Government, Ministries and relevant authorities for their kind cooperation and assistance rendered in carrying out the study. The Mission would also appreciate their valuable opinions and comments given by the CEOs of the private sector. Equally we thank very much the Ministry of Foreign Affairs of Japan, Embassy of Japan and Japan International Cooperation Agency for their excellent support. Lastly but not least, we are very much obliged to Ministry of Foreign Affairs of Zambia, specially His Excellency Godfrey S. Simasiku, Ambassador and Mr. Sylvester Mundanda, First Secretary at Embassy of Zambia in Tokyo for their thoughtful advices and guidance during preparation of the Mission. Without their assistance the Mission would not be realized.

Hisashi TAKANASHI
Team Leader, ECFA
March 2006
Chapter 2

Overview
Chapter 2  Overview

2.1 Geology
Zambia is a land-locked country covering an area of 752,612 square kilometers (about 2.5 percent of Africa). It lies between 8 ° S and 18 ° S, and between 20 ° E and 35 ° E, and shares borders with the Democratic Republic of Congo (DRC) and Tanzania in the north; Malawi and Mozambique in the east; Zimbabwe and Botswana in the south, Namibia in the southwest and Angola in the west.
It has a tropical climate and vegetation with three distinct seasons: the cool dry winter from May to August, a hot dry season during September and October and a warm wet season from November to April.
Among the main river water sources in Zambia are the Zambezi, Kafue, Luangwa and Luapula. The country also has major lakes such as Tanganyika, Mweru, Bangweulu and the man-made Kariba. The northern part of the country receives the highest rainfall with an annual average ranging from 1,100 mm to over 1,400 mm. The southern and eastern parts of the country have less rainfall, ranging from 600 mm to 1,100 mm annually, which often results in droughts.

2.2 Administrative Province
Zambia is administratively divided into nine provinces. Of the nine provinces, two are predominantly urban, namely Lusaka and Copperbelt provinces. The remaining provinces such as Central, Eastern, Northern, Luapula, North Western, Western and Southern provinces are rural provinces. The country is further divided into 72 districts, 150 Constituencies and 1,286 wards. Lusaka is the capital of the country.

2.3 Population
The population of Zambia has been estimated at 9.89 million based on 2000 census survey. By province, the Copperbelt province accounts for the largest share of 1.6 million followed by Lusaka province (1.4 million), Eastern province (1.3 million), and Northern province (1.3 million). The annual population growth averaged 2.4% for the country compared with 2.9% in 1990s and 3.1% in the 1980s. The population growth in Lusaka is getting higher as more people migrated to the city, while the Copperbelt showed only 0.8% due to out-going population. Urbanization is a growing concern in Zambia. The growth rate, however, has bee continued to decline more recently due to effect of HIV/AIDS. The population density is sparse in Zambia amounting to 4.6 persons per km2 in North-Western province and 6.1 in Western province and on the whole 13.1 persons per km2 in the country.
Table 2-1  Population Size and Growth Rates, 2000

<table>
<thead>
<tr>
<th>Province</th>
<th>Population</th>
<th>Annual Growth Rate (%)</th>
<th>Area (km²)</th>
<th>Population Density (person/km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>1,012,257</td>
<td>2.7</td>
<td>94,394</td>
<td>10.7</td>
</tr>
<tr>
<td>Copperbelt</td>
<td>1,581,221</td>
<td>0.8</td>
<td>31,328</td>
<td>50.5</td>
</tr>
<tr>
<td>Eastern</td>
<td>1,306,173</td>
<td>2.6</td>
<td>69,106</td>
<td>18.9</td>
</tr>
<tr>
<td>Luapula</td>
<td>775,353</td>
<td>3.2</td>
<td>50,567</td>
<td>15.3</td>
</tr>
<tr>
<td>Lusaka</td>
<td>1,391,329</td>
<td>3.4</td>
<td>21,896</td>
<td>63.5</td>
</tr>
<tr>
<td>Northern</td>
<td>1,258,696</td>
<td>3.1</td>
<td>147,826</td>
<td>8.5</td>
</tr>
<tr>
<td>North-Western</td>
<td>583,350</td>
<td>2.9</td>
<td>125,826</td>
<td>4.6</td>
</tr>
<tr>
<td>Southern</td>
<td>1,212,124</td>
<td>2.5</td>
<td>85,283</td>
<td>14.2</td>
</tr>
<tr>
<td>Western</td>
<td>765,088</td>
<td>1.8</td>
<td>126,386</td>
<td>6.1</td>
</tr>
<tr>
<td>Zambia</td>
<td>9,885,591</td>
<td>2.4</td>
<td>752,612</td>
<td>13.1</td>
</tr>
</tbody>
</table>

Source: Census 2000 of Population and Housing, Central Statistical Office

More recent data shows the population amounts to 10.5 million in 2004 according to the World Bank estimate.

2.4 Economy

The country has been implementing vigorous development programs aimed at poverty reduction and augmenting economic growth. The Poverty Reduction Strategy Paper (PRSP) was prepared in 2002 in collaboration with the World Bank to promote growth and diversification in production and exports, to improve delivery of social services and to incorporate crosscutting policies for HIV/AIDS, gender and the environment. The Transitional National Development Plan: TNDP (2002-2006) which is aligned with PRSP seeks to achieve priority areas of 1) diversified and export-oriented economy which creates an enabling environment for facilitating private investment and development, 2) improved lives and protection of the vulnerable, which will improve the quality of life of the population and facilitate the achievement of Millennium Development Goals (MDGs) through better service delivery and 3) an efficient public sector management to improve governance and overall effectiveness of public expenditure programs.

The economic growth has accelerated averaging 3.9 percent per year between 1998 and 2004. Growth over the last few years has been especially remarkable in excess of six percent in 2003 and 2004. Most of the sectors have contributed positively to growth, however, the recent achievement has been contributed by rapid expansion of mining and construction. The renewed growth of the mining sector is a result of new investments following the privatisation of state-owned mines in 2000 and by favourable conditions in world copper markets.
Chapter 2  Overview

Table 2-2  Annual GDP Growth Rates Sector, 1998-2004

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<tr>
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<tbody>
<tr>
<td>GDP</td>
<td>100.0</td>
<td>-1.4 3.1 3.4 4.6 4.6 6.0 6.8 3.9</td>
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<tr>
<td>Agriculture</td>
<td>18.4</td>
<td>1.2 10.1 1.5 -2.5 -1.7 5.0 4.3 2.6</td>
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<tr>
<td>Mining</td>
<td>10.2</td>
<td>-25.1 -24.8 0.1 14.0 16.4 3.4 12.7 -0.5</td>
<td></td>
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<tr>
<td>Manufacturing</td>
<td>11.8</td>
<td>1.9 2.8 3.5 4.2 5.7 7.6 3.6 4.2</td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>3.4</td>
<td>0.6 2.5 1.2 12.6 -5.2 0.6 -1.8 1.5</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>5.4</td>
<td>-9.1 3.2 6.5 11.5 17.4 21.6 32.0 11.9</td>
<td></td>
</tr>
<tr>
<td>Trade/transport</td>
<td>27.4</td>
<td>4.7 4.8 2.3 4.7 4.2 5.8 5.2 4.5</td>
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<tr>
<td>Tourism</td>
<td>2.2</td>
<td>3.8 -6.2 12.3 24.4 4.8 6.9 5.9 7.4</td>
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</tr>
<tr>
<td>Other services</td>
<td>21.2</td>
<td>3.8 9.4 6.0 3.2 3.4 3.2 2.8 4.6</td>
<td></td>
</tr>
</tbody>
</table>

Source: National Accounts, Central Statistic Office, 2005

The construction sector has also achieved high growth as a result of private construction activities, especially in residential housing around the urban centres.

During this period tourism has grown strongly, averaging 7.4 percent. However, contribution by tourism sector remains small. Manufacturing sector showed only 4.2 percent of average growth rate as it has been concentrated in food processing and textile industries, which are not high-value added industries. The import-substitution manufacturing should be promoted in the country. Agriculture
sector has not performed well in recent years, with wide fluctuations in production and a low average growth rate of only 2.6 percent. This indicates weather-prone agriculture situations facing considerable variation in rain-fall patterns as well as inadequate irrigation facilities. Cash crops such as cotton and tobacco leads the sector.

Table 2-3  Annual Growth Rates by Expenditure Type, 1998-2004

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (market prices)</td>
<td>100.0</td>
<td>-1.9</td>
<td>2.2</td>
<td>3.6</td>
<td>4.9</td>
<td>3.3</td>
<td>4.2</td>
<td>6.4</td>
</tr>
<tr>
<td>Government</td>
<td>13.5</td>
<td>-14.8</td>
<td>-19.4</td>
<td>-21.6</td>
<td>44.7</td>
<td>2.3</td>
<td>19.3</td>
<td>6.4</td>
</tr>
<tr>
<td>Private Consumption</td>
<td>79.2</td>
<td>-1.3</td>
<td>-3.0</td>
<td>2.3</td>
<td>-14.2</td>
<td>14.8</td>
<td>4.4</td>
<td>-2.9</td>
</tr>
<tr>
<td>Investment</td>
<td>17.1</td>
<td>9.6</td>
<td>8.4</td>
<td>8.4</td>
<td>15.1</td>
<td>17.2</td>
<td>18.9</td>
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</tr>
<tr>
<td>Export</td>
<td>38.1</td>
<td>4.9</td>
<td>4.9</td>
<td>-14.4</td>
<td>28.3</td>
<td>-223</td>
<td>-16.3</td>
<td>21.2</td>
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<td>Import</td>
<td>-41.6</td>
<td>4.6</td>
<td>1.6</td>
<td>-20.1</td>
<td>1.2</td>
<td>1.8</td>
<td>1.7</td>
<td>-6.4</td>
</tr>
</tbody>
</table>

Source: National Accounts, Central Statistic Office, 2005

According to the Table 2-3, it has been found that the recent growth has been investment-driven development. In fact, investment growth has averaged over ten percent since 1998 and has been accelerating alongside construction and mining sector. The government expenditure has been erratic, with rapid declines during the late-1990s. It has offset a subsequent period of faster growth. Similarly, export growth has fluctuated in response to sharp movements in world copper prices. By contrast, import growth has been slow and has declined on average since 1998. Furthermore, private consumption has been only 0.8 percent which is very much below the average population growth of 2.0 percent.

In spite of strong performance of the economy, it is important to note that these economic growths of GDP have not unfortunately translated into significant declines in poverty. Poverty remains high and has changed little since 1998. It was because recent growth has been investment-driven and concentrated in mining and construction. The capital-intensive development, compared with labor-intensive development, would not contribute to people’s job creation and income generation. The country’s poor population has not benefited from growth process and remain in rural areas and within lower cost areas outside of the main urban centres. The recent economic performance may suggest that, in terms of poverty-reduction, the structure of growth may be as important as the level of growth

\[1\]

\[1\] Draft NDP 2006-2011, Chapter Seven , National Strategic Focus and Theme, Recent Growth and Poverty, P3
### Table 2-4 Progress Towards Attaining the Millennium Development Goals for Zambia

<table>
<thead>
<tr>
<th>Millennium Development Goals and Targets</th>
<th>Indicator Measures</th>
<th>Early 1990s</th>
<th>Late 1990</th>
<th>Early 2000</th>
<th>Progress towards MDG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. ERADICATE EXTREME POVERTY AND HUNGER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halve between 1990 and 2015 the proportion of people living on less than one dollar a day</td>
<td>Overall Poverty</td>
<td>70</td>
<td>73</td>
<td>Deterioration</td>
<td></td>
</tr>
<tr>
<td>Halve between 1990 and 2015 the proportion of people who suffer from hunger</td>
<td>Stunting (5 years And Under)</td>
<td>39</td>
<td>47</td>
<td>Deterioration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>undernourished</td>
<td>45</td>
<td>50</td>
<td>Deterioration</td>
<td></td>
</tr>
<tr>
<td><strong>2. ACHIEVE UNIVERSAL PRIMARY EDUCATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary school</td>
<td>Net primary enrollment</td>
<td>69</td>
<td>68</td>
<td>No progress</td>
<td></td>
</tr>
<tr>
<td><strong>3. PROMOTE GENDER EQUALITY AND EMPOWER WOMEN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015</td>
<td>Net Primary Enrollment, Female/Male</td>
<td>0.97</td>
<td>0.98</td>
<td>On track</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Net Secondary Enrollment Female/Male</td>
<td>0.74</td>
<td>0.90</td>
<td>On track</td>
<td></td>
</tr>
<tr>
<td><strong>4. REDUCE CHILD MORTALITY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce by two thirds, between 1990 and 2015, the under-five mortality rate</td>
<td>Under-five mortality rate(per 1,000live births)</td>
<td>151</td>
<td>162</td>
<td>Deterioration</td>
<td></td>
</tr>
<tr>
<td><strong>5. IMPROVE MATERNAL HEALTH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio</td>
<td>Antenatal care from health professional</td>
<td>92</td>
<td>93</td>
<td>No Change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tetanus toxoid injections</td>
<td>82</td>
<td>76</td>
<td>Deterioration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medically assisted deliveries</td>
<td>51</td>
<td>43</td>
<td>Deterioration</td>
<td></td>
</tr>
<tr>
<td><strong>6. COMBAT HIV/AIDS, MALARIA, AND OTHER DISEASES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 2  Overview

Have halted by 2015 and begun to reverse the spread of HIV/AIDS

<table>
<thead>
<tr>
<th>HIV/AIDS prevalence rate</th>
<th>Knowledge of AIDS</th>
<th>Use of condoms: Spouse or cohabitating Partner Non-cohabitating partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>99.3 (female)98.6 (male)</td>
<td>No data</td>
<td>6.2 (female)9.5 (male)</td>
</tr>
<tr>
<td>17.8 (female)12.9 (male)</td>
<td>No data</td>
<td>31.2(female)44.1 (male)</td>
</tr>
</tbody>
</table>

Have halted by 2015 and begun to reverse the incidence of malaria and other diseases

| Malaria incidence rate(per 1,000 of the population) | 354 | No data |

7. ENSURE ENVIRONMENTAL SUSTAINABILITY

Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources

| Access to safe drinking water | 88(urban) 28(rural) | 86(urban) 30(rural) | No Change |

Halve by 2015 the proportion of people without sustainable access to safe drinking water

Source: Country Assistance Strategy for Zambia, World Bank March 9, 2004

2.5 International Trade

Zambia experienced trade surplus before 1999 when K654,084 was recorded. The trend reversed thereafter with the country experiencing the severe trade deficits. The highest trade deficit was reported in 2003 with the figures of K2,797,449. Table 2-4 shows the trends of imports, exports and trade balances. The exports increased significantly from 1999 to 2003. On the other hand, imports were growing steadily resulting into trade surpluses in 1999. However, after 1999 imports increased with notable margins against exports resulting in highest trade deficits recorded in 2003.

Table 2-5 Summary of External Trade Statistics, 1999-2004(K Million)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002**</th>
<th>2003</th>
<th>2004**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Exports (fob)</td>
<td>2,327,900</td>
<td>2,716,557</td>
<td>3,537,206</td>
<td>4,069,916</td>
<td>4,626,000</td>
<td>3,664,676</td>
</tr>
<tr>
<td>Total Imports (cif)</td>
<td>1,673,816</td>
<td>2,751,563</td>
<td>3,900,496</td>
<td>4,725,224</td>
<td>7,423,450</td>
<td>4,730,941</td>
</tr>
<tr>
<td>Trade Balance</td>
<td>654,084</td>
<td>(35,006)</td>
<td>(363,290)</td>
<td>(655,307)</td>
<td>(2,797,449)</td>
<td>(1,066,264)</td>
</tr>
</tbody>
</table>

Source: External Trade Statistics Bulletin 2004, Central Statistics Office, Zambia Note: Data for 2004 are up to June

These gaps between low export earnings and high import values could only be improved when higher processing and value addition of raw materials further encouraged to export as well as to substitute the imported items.
(1) Exports
The exports comprise major product items such as copper, cobalt, cotton, semi-precious stones, sugar, tobacco and cement. For traditional exports the copper continues to be Zambia’s major foreign exchange earner, contributing on average about 46 percent of the total export earnings for the period 1999 to 2003. The copper and cobalt together made an average contribution of about 64 percent to the total exports during the same period. Unique export item is electricity supply to the neighboring countries.

Table 2-6 Major Export Commodities for Zambia, 1999-2004 (K’Millions)

<table>
<thead>
<tr>
<th>Product</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined Copper</td>
<td>995,184</td>
<td>1,386,254</td>
<td>1,747,270</td>
<td>2,004,120</td>
<td>1,866,408</td>
<td>1,049,005</td>
</tr>
<tr>
<td></td>
<td>(42.8%)</td>
<td>(51.0%)</td>
<td>(49.4%)</td>
<td>(49.2%)</td>
<td>(40.3%)</td>
<td>(28.6%)</td>
</tr>
<tr>
<td>Cobalt</td>
<td>504,374</td>
<td>518,972</td>
<td>600,586</td>
<td>565,645</td>
<td>631,820</td>
<td>633,294</td>
</tr>
<tr>
<td></td>
<td>(21.7%)</td>
<td>(19.1%)</td>
<td>(17.0%)</td>
<td>(13.9%)</td>
<td>(13.7%)</td>
<td>(17.3%)</td>
</tr>
<tr>
<td>Cotton</td>
<td>175,798</td>
<td>104,265</td>
<td>146,253</td>
<td>165,223</td>
<td>221,457</td>
<td>383,095</td>
</tr>
<tr>
<td></td>
<td>(7.6%)</td>
<td>(3.8%)</td>
<td>(4.1%)</td>
<td>(4.1%)</td>
<td>(4.8%)</td>
<td>(10.5%)</td>
</tr>
<tr>
<td>Semi/Precious Stones</td>
<td>39,690</td>
<td>54,078</td>
<td>121,236</td>
<td>199,608</td>
<td>357,131</td>
<td>59,628</td>
</tr>
<tr>
<td>Sugar</td>
<td>57,584</td>
<td>72,350</td>
<td>132,934</td>
<td>138,536</td>
<td>147,398</td>
<td>94,819</td>
</tr>
<tr>
<td>Tobacco</td>
<td>56,109</td>
<td>26,887</td>
<td>41,383</td>
<td>70,098</td>
<td>95,138</td>
<td>121,669</td>
</tr>
<tr>
<td>Cut Flowers</td>
<td>5,075</td>
<td>9,475</td>
<td>17,721</td>
<td>14,365</td>
<td>36,275</td>
<td>10,985</td>
</tr>
<tr>
<td>Cement</td>
<td>17,985</td>
<td>31,769</td>
<td>24,066</td>
<td>20,813</td>
<td>28,308</td>
<td>16,913</td>
</tr>
</tbody>
</table>

Source: External Trade Statistic Bulletin 2004, CSO Data for 2004 run up to June Note: Data for 2004 are up to June

(2) Market
Table 2-7 indicates clearly that Europe is used be the major destination of Zambia’s exports accounting for the market share of more than 20 percent, of which the European Union (EU) countries account for the biggest proportion. The reduction in the EU’s market share could be attributed to Zambia’s shift to SADC region, which has greatly increased from 28 percent in 1999 to 43 percent in 2003. Among SADC region Zambia’s major trading partners are South Africa, Congo (DR), Tanzania and Malawi. These four countries comprise about 92 percent of the total SADC market share.
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Table 2-7  Zambia’s Markets for Exports between 1999 and 2004

<table>
<thead>
<tr>
<th>Market Region</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K Mill</td>
<td>K Mill</td>
<td>K Mill</td>
<td>K Mill</td>
<td>K Mill</td>
<td>K Mill</td>
</tr>
<tr>
<td>A.COMESA</td>
<td>267,788</td>
<td>259,440</td>
<td>270,586</td>
<td>758,617</td>
<td>882,047</td>
<td>1,053,871</td>
</tr>
<tr>
<td>B. Europe</td>
<td>196,307</td>
<td>204,644</td>
<td>295,664</td>
<td>265,474</td>
<td>320,641</td>
<td>250,516</td>
</tr>
<tr>
<td>C. ASIA</td>
<td>40,172</td>
<td>44,442</td>
<td>202,641</td>
<td>204,697</td>
<td>357,903</td>
<td>62,267</td>
</tr>
<tr>
<td>D. South Africa</td>
<td>186,421</td>
<td>148,000</td>
<td>255,670</td>
<td>388,918</td>
<td>349,425</td>
<td>575,519</td>
</tr>
<tr>
<td>Total</td>
<td>973,627</td>
<td>775,414</td>
<td>1,123,843</td>
<td>1,745,707</td>
<td>2,054,423</td>
<td>2,016,806</td>
</tr>
</tbody>
</table>

Source: External Trade Statistic Bulletin 2004, CSO Data for 2004 run up to June

(3) Imports

The output from the Zambian’s industrial sector is insufficient to satisfy domestic demand, hence the huge imports from SADC region to complement local products. In some cases, the goods imported from South Africa are relatively cheaper than Zambian products. This could be due to high cost of production locally and also due to large economies of scale created by industries in South Africa.

Table 2-8 Major Import Commodities for Zambia, 1999-2004 (K’Millions)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and beverages in primary form</td>
<td>49,119</td>
<td>63,981</td>
<td>92,082</td>
<td>197,068</td>
<td>310,266</td>
<td>117,324</td>
</tr>
<tr>
<td>Food and beverages, processed</td>
<td>115,812</td>
<td>137,749</td>
<td>229,487</td>
<td>286,846</td>
<td>443,828</td>
<td>200,632</td>
</tr>
<tr>
<td>Industrial supplies, primary form</td>
<td>61,583</td>
<td>140,685</td>
<td>129,732</td>
<td>259,994</td>
<td>411,819</td>
<td>141,419</td>
</tr>
<tr>
<td>Industrial supplies, processed</td>
<td>624,111</td>
<td>969,062</td>
<td>1,447,197</td>
<td>1,555,314</td>
<td>2,599,800</td>
<td>1,850,683</td>
</tr>
<tr>
<td>Fuel and lubricants, primary form</td>
<td>77,182</td>
<td>326,801</td>
<td>251,888</td>
<td>270,180</td>
<td>554,957</td>
<td>545,295</td>
</tr>
<tr>
<td>Capital goods</td>
<td>244,134</td>
<td>295,889</td>
<td>560,069</td>
<td>704,057</td>
<td>1,178,398</td>
<td>696,172</td>
</tr>
<tr>
<td>Parts and accessories of capital goods</td>
<td>100,907</td>
<td>216,761</td>
<td>380,121</td>
<td>387,649</td>
<td>586,482</td>
<td>430,911</td>
</tr>
<tr>
<td>Total</td>
<td>1,673,816</td>
<td>2,751,563</td>
<td>3,900,496</td>
<td>4,725,224</td>
<td>7,423,450</td>
<td>4,730,941</td>
</tr>
</tbody>
</table>

Source: External Trade Statistic Bulletin 2004, CSO Data for 2004 run up to June Note: Data for 2004 are up to June

These continued trade imbalances are as a result of narrow export-product base, limited market access and poor terms of trade. Furthermore the exports are mainly unprocessed and semi-processed intermediate products such as non-ferrous metals and their articles, cotton yarn, unroasted coffee and tobacco, which are prone to price fluctuation in the international market.

This gap between low export earnings and high import values could only be solved when major efforts are made towards higher processing of locally available raw materials for value addition so that curbing of large imports and promoting of additional exports could take place.
2.6 Foreign Assistance

The Ministry of Foreign Affairs is responsible for requesting and coordinating foreign assistance. Zambia depends quite heavily on foreign assistance which caters for some thirty percent of the government budget. The top bilateral donors are Germany, UK, USA, Norway, Netherlands, Denmark and Japan. Particularly, Germany and United States have increased their shares from 19.0% and 6.6% in 1999 to 39.4% and 10.7% respectively in 2003 while UK and Japan decreased their shares from 18.7% and 17.5% in 1999 11.1% and 4.8% respectively in 2003. Multilateral donors are World Bank (IDA), European Commission and IMF which have played important roles up to now. The IMF suspended its budget support during 2001 and 2003 as a result of lack of stringent macroeconomic policy and poor public expenditure management. The Government and IMF adopted a new framework of poverty reduction scheme called Poverty Reduction Growth Facilities (PRGF) in 2004 and the overall budget deficit for 2004 reduced to 3.9% of GDP compared with 6.0% in 2003. This fiscal efforts together with major structural reforms allowed the country to reach completion points of Heavily Indebted Poor Countries (HIPC) in 2005 and triggered an external debt cancellation of US$ 3.8 billion. In view of this situations, Japan is expected to take a lead, under Tokyo International Conference on African Development (TICAD), to strengthen its ODA to Zambia.

Table 2-9  Official Development Assistance (ODA) for Zambia (US$m)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bilateral</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>340.0</td>
<td>486.2</td>
<td>274.1</td>
<td>359.5</td>
<td>591.7</td>
</tr>
<tr>
<td>UK</td>
<td>64.7</td>
<td>112.2</td>
<td>13.8</td>
<td>44.2</td>
<td>233.2</td>
</tr>
<tr>
<td>Japan</td>
<td>63.6</td>
<td>111.4</td>
<td>55.8</td>
<td>28.1</td>
<td>65.9</td>
</tr>
<tr>
<td></td>
<td><strong>59.41</strong></td>
<td><strong>31.93</strong></td>
<td><strong>47.04</strong></td>
<td><strong>68.38</strong></td>
<td><strong>28.32</strong></td>
</tr>
<tr>
<td>US</td>
<td>22.6</td>
<td>46.1</td>
<td>29.0</td>
<td>48.3</td>
<td>63.6</td>
</tr>
<tr>
<td>Norway</td>
<td>27.4</td>
<td>24.8</td>
<td>20.8</td>
<td>29.1</td>
<td>35.6</td>
</tr>
<tr>
<td>Netherlands</td>
<td>13.5</td>
<td>51.2</td>
<td>29.6</td>
<td>35.5</td>
<td>34.8</td>
</tr>
<tr>
<td>Denmark</td>
<td>25.7</td>
<td>23.1</td>
<td>22.6</td>
<td>32.2</td>
<td>30.2</td>
</tr>
<tr>
<td><strong>Multilateral</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Development Association</td>
<td>283.5</td>
<td>308.6</td>
<td>74.1</td>
<td>278.9</td>
<td>-32.1</td>
</tr>
<tr>
<td>European Commission</td>
<td>151.6</td>
<td>205.8</td>
<td>135.8</td>
<td>149.7</td>
<td>81.8</td>
</tr>
<tr>
<td>IMF</td>
<td>80.9</td>
<td>25.7</td>
<td>44.2</td>
<td>104.0</td>
<td>79.4</td>
</tr>
<tr>
<td></td>
<td>13.7</td>
<td>26.4</td>
<td>-148.9</td>
<td>-45.3</td>
<td>-236.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>623.6</td>
<td>795.1</td>
<td>349.1</td>
<td>640.6</td>
<td>560.1</td>
</tr>
<tr>
<td>Grants</td>
<td>439.5</td>
<td>523.3</td>
<td>396.3</td>
<td>525.1</td>
<td>718.4</td>
</tr>
</tbody>
</table>

Source: OECD Development Assistance Committee, Geographical Distribution of Financial Flows to Aid Recipients.
Chapter 3

Proposed National Development Strategies
Chapter 3  Proposed National Development Strategies

3-1 Fifth National Development Plan (NDP)

The Government is now preparing for next national development plan, of which primary objective is obviously aimed at focusing on poverty reduction in the country. The planned growth and scenario considered are presented in Table 2-7.

| Table 3-1  Annual Growth Rates by Sector under the Current Growth Path, 2005-2011 |
|-----------|----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|           | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | (06-11) |
| GDP (factor cost) | 100.0 | 5.2 | 5.9 | 5.9 | 6.2 | 6.4 | 6.2 | 5.9 | 6.1 |
| Agriculture | 21.4 | 2.8 | 4.5 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 3.9 |
| Staple crops | 11.9 | 2.5 | 4.0 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.6 |
| Cash crops | 1.7 | 4.0 | 6.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.2 |
| Other agriculture | 7.8 | 3.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.2 |
| Mining | 4.8 | 12.9 | 17.9 | 15.0 | 10.0 | 8.0 | 7.5 | 7.5 | 11.0 |
| Manufacturing | 14.8 | 4.0 | 5.0 | 6.0 | 7.0 | 7.5 | 7.4 | 7.1 | 6.7 |
| Food processing | 8.9 | 4.0 | 5.0 | 6.0 | 7.0 | 7.5 | 7.0 | 6.5 | 6.5 |
| Energy | 3.7 | 1.1 | 2.3 | 5.5 | 14.0 | 16.0 | 13.3 | 10.6 | 10.3 |
| Construction | 12.8 | 10.0 | 9.0 | 8.0 | 8.0 | 8.0 | 7.5 | 7.0 | 7.9 |
| Trade and transport | 22.5 | 5.2 | 5.5 | 5.9 | 6.3 | 6.7 | 6.7 | 6.7 | 6.3 |
| Tourism | 1.0 | 8.0 | 7.0 | 6.0 | 8.0 | 10.0 | 10.0 | 10.0 | 8.5 |
| Other services | 24.8 | 4.3 | 3.9 | 4.2 | 4.5 | 4.6 | 4.6 | 4.5 | 4.4 |

Source: Results from the 2004 Zambia CGE model and projections from Ministry of Finance and National Planning.

Growth scenario is planned to average 6.1 percent per annum during the period of 2006-2011. Mining and construction sector will continue to lead the economy, as recent investments in new mines become active. The construction sector is also expected to grow together with the energy sector, as rehabilitated power plants at the Kafue Gorge Power Station and elsewhere become fully operational. Agriculture is to make a gradual improvement with 3.9 percent growth rates over the NDP period, reflecting the vulnerabilities of the sector. Finally, growth in most sectors is expected to increase over time leading to a more balanced structure of growth.

Nevertheless, as has been seen, the capital-intensive and investment driven growth are unlikely to
solve the poverty issues. The poverty alleviation would be achieved only if the poor population could participate in the economy in terms of enjoying employment opportunities and favourable income generation. Identification of priority sectors to enhance in-depth growth in terms of labour-intensive manner is the focus of the national development plan. The new additional development strategies are therefore of urgent needs for Zambia.

3-2 Acceleration of Zambia’s Industrialization

Without economic growth there would be few opportunities for the country to reduce poverty. The national development strategy focuses on identifying new growth pass that are able to significantly reduce poverty. In this connection, there might be the room for transferring Asian lessons and experiences of economic development to African region including Zambia. On the whole, two regions (Asia and Africa) have received more or less similar amount of ODA disbursement from OECD countries (Source: OECD DAC, 2005) as follows:

**Figure 3-1 Trend of ODA Disbursement for Africa and Asia (1960-2004)**

With these ODA fund Asian countries spent to rehabilitate and build infrastructure facilities to cater for foreign investment in manufacturing sector. The following figure illustrates that the Asian countries have successfully captured world foreign investment me than African countries.
One of the myths of the miracle of high economic growth in Asia lies in development policies in which the priority has been placed on manufacturing sector development as well as on infrastructure development (e.g. electricity, road and highway, water supply and sanitation, irrigation) to facilitate foreign and domestic investment promotion.

The following table (Source: World Bank Atlas, 2005) shows that there has been good corelation between GDP growth and manufacturing sector growth in Asian countries. Most of the Asian countries have increased their GDP almost doble in size and Vietnam showed six times growth.
between 1990 and 2003. On the other hand in Africa Tanzania and Zimbabwe achieved double growth and the remaining countries including Zambia were not able to achieve even two times growth. Manufacturing sector, in this connection, has played important role to lead the economic growth in Asia. Most of the Asian countries have achieved more than 20% share of GDP while in African countries the manufacturing sector has remained at less than 20%. In case of Zambia the share of manufacturing sector has decreased from 36% to 12% in 2003.

Recent Zambia trade records clearly indicate that the major partners in terms of both exports and imports increasingly shifted from European countries to African countries, particularly neighboring SADC countries.

<table>
<thead>
<tr>
<th>Country (Southern Africa)</th>
<th>Population (mil)</th>
<th>Country (South East Asia)</th>
<th>Population (mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>10.5</td>
<td>Philippines</td>
<td>81.5</td>
</tr>
<tr>
<td>Congo</td>
<td>53.2</td>
<td>Thailand</td>
<td>62.0</td>
</tr>
<tr>
<td>Angola</td>
<td>13.5</td>
<td>Malaysia</td>
<td>24.8</td>
</tr>
<tr>
<td>Namibia</td>
<td>2.0</td>
<td>Singapore</td>
<td>4.3</td>
</tr>
<tr>
<td>Botswana</td>
<td>1.7</td>
<td>Indonesia</td>
<td>214.7</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>13.1</td>
<td>ASEAN</td>
<td>387.3</td>
</tr>
<tr>
<td>Malawi</td>
<td>11.0</td>
<td>Laos</td>
<td>5.7</td>
</tr>
<tr>
<td>Mozambique</td>
<td>18.8</td>
<td>Vietnam</td>
<td>81.3</td>
</tr>
<tr>
<td>Tanzania</td>
<td>35.9</td>
<td>Cambodia</td>
<td>13.4</td>
</tr>
<tr>
<td>South Africa</td>
<td>45.8</td>
<td>Myanmar</td>
<td>49.4</td>
</tr>
<tr>
<td>Kenya</td>
<td>31.9</td>
<td>Additional ASEAN</td>
<td>149.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>237.3</strong></td>
<td><strong>Total</strong></td>
<td><strong>537.1</strong></td>
</tr>
</tbody>
</table>

Table 3-3 Comparison of Population Sizes Between SADC and ASEAN Region

Source: World Development Indicator, 2005

Only eleven SADC countries appear to be sufficient size comparable with ASEAN countries in terms of population. Zambia, therefore, needs to focus neighboring countries as targeted economic market from now on. Industrialization is the most urgent task to encourage domestic industries to produce substitute commodities against imports from SADAC countries and promote higher-valued commodities production utilizing locally available resources to increase exports to the region.

As effective economic reforms, Zambia should launch again the challenge of diversifying its economy and accelerating private sector-led growth in order to further promote economic growth of
Zambia. We hereby propose the following national development strategies:

1. To utilize abundant water resources and develop hydropower stations to supply neighboring countries, particularly South Africa which is said a long term electricity deficient country,
2. To accelerate agricultural sector development through provision of adequate irrigation facilities and emphasize market-led and commercialization farming practices,
3. To improve water treatment facilities in major cities and achieve safe and clean water supply to the population,
4. To enhance domestic and regional traffic flows through improvement of road transport facilities including border trade facilities, and
5. To strengthen and intensify industrialization in Zambia through small and medium scale industry development which provide employment as well as income opportunities.

The details will be further elaborated in the following sectoral development strategies.
Chapter 4

Sectoral Development Strategies
A Transport Sector
A Transport Sector

Chapter 4  Sectoral Development Strategies

A. Transport Sector

A-1  Outline of the transportation sector

(1) Road transport

(a) Road network

Zambia has 37,000 km of gazetted roads and 30,671 km of ungazetted roads classified under feeder, national park and estate roads. About 60% of gazetted roads are not paved and only 18% are paved with asphalt.

Table A-1  Pavement condition of gazetted roads (2002)

<table>
<thead>
<tr>
<th>Pavement Type</th>
<th>Total Length (km)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt</td>
<td>6,476</td>
<td>17.5%</td>
</tr>
<tr>
<td>Gravel</td>
<td>8,478</td>
<td>23.0%</td>
</tr>
<tr>
<td>Earth</td>
<td>21,967</td>
<td>59.5%</td>
</tr>
</tbody>
</table>

Source: Transport Policy, May 2002

The core road network, which consists of trunk (T), main (M), district (D), urban (U), primary feeder (PF) and primary tourist (TR) roads, is defined as the bare minimum road network required to be maintained continuously and on a sustainable basis so as to unleash Zambia’s potential to promote self-development as the only approach to poverty alleviation for economic growth.

Therefore, there is a need for systematic upgrading, repair and maintenance of the core road network, which has been implemented through the Road Sector Investment Program (ROADSIP) since 1998.

Table A-2  Summary of road network (2002)

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Total Estimated Network (km)</th>
<th>Core Road Network (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk (T)</td>
<td>3,088</td>
<td>3,088</td>
</tr>
<tr>
<td>Main (M)</td>
<td>3,691</td>
<td>3,691</td>
</tr>
<tr>
<td>District (D)</td>
<td>13,707</td>
<td>13,707</td>
</tr>
<tr>
<td>Urban (U)</td>
<td>5,294</td>
<td>5,294</td>
</tr>
<tr>
<td>Primary feeder (PF)</td>
<td>15,800</td>
<td>14,333</td>
</tr>
<tr>
<td>Primary tourist (TR)*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Secondary feeder (SF)</td>
<td>10,060</td>
<td>-</td>
</tr>
<tr>
<td>Tertiary feeder (TF)</td>
<td>4,424</td>
<td>-</td>
</tr>
<tr>
<td>Park roads</td>
<td>6,607</td>
<td>-</td>
</tr>
<tr>
<td>Community roads</td>
<td>5,000</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>67,671</td>
<td>40,113</td>
</tr>
</tbody>
</table>

*The length of 2,065 km for TR is included in D & PF roads.
Source: ROADSIP II Bankable Document
The percentage of paved trunk, main and district roads in good condition rose slightly from 56% to 57% in 2004, whereas paved roads in fair condition declined from 27% to 22% and paved roads in poor condition increased from 17% to 21% in 2004.

**Table A-3  Condition of trunk, main and district paved road network**

<table>
<thead>
<tr>
<th>Year</th>
<th>Good (%)</th>
<th>Fair (%)</th>
<th>Poor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>21</td>
<td>40</td>
<td>39</td>
</tr>
<tr>
<td>1998</td>
<td>31</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td>1999</td>
<td>35</td>
<td>36</td>
<td>29</td>
</tr>
<tr>
<td>2000</td>
<td>43</td>
<td>28</td>
<td>29</td>
</tr>
<tr>
<td>2001</td>
<td>45</td>
<td>24</td>
<td>31</td>
</tr>
<tr>
<td>2002</td>
<td>59</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>2003</td>
<td>56</td>
<td>27</td>
<td>17</td>
</tr>
<tr>
<td>2004</td>
<td>57</td>
<td>22</td>
<td>21</td>
</tr>
</tbody>
</table>

Source: NRFA Annual Report, 2004
(b) Bridges/pontoons

The geography of Zambia is such that access to many areas of the country and neighboring countries depends on crossing major rivers. For example, the Zambian portion of the Zambezi River is spanned by only four bridges: at Chinyingi, Katima Mulilo, Victoria Falls and Chirundu. In cases where bridges have not been constructed, pontoons and ferries are used.

Figure A-2 Location of Zambezi River bridges/pontoons

- Pontoon in Kazungula

Kazungula is located 60 km west of Livingstone, at the border with Namibia, Botswana and Zimbabwe. This point is used as one of the North-South corridors connecting the DR Congo, Zambia and South Africa.

Pontoons, provided at Botswana, carry trailers that are shuttled between the northern area (Zambia, Congo) and the southern area (South Africa, Botswana and Zimbabwe) as well as people who wish to shop on the opposite bank.

Engineering Services Corporation Ltd. (ESCO), a semi-governmental organization existing as a subsidiary of the Ministry of Works and Supply, manages this pontoon system.

The current state of the pontoon service is as follows:

Number of pontoons: Two
Size of pontoons: 70 tons (Length 32 m × Width 7.5 m)
One full-sized trailer can ride on the pontoon
Or, a semi-trailer carrying one truck and one car can ride on the pontoon.
Chapter 4  Sectoral Development Strategies

Operating time: 6:00–18:00
Frequency: 1.5 round trips / hour (20 minutes / one way)
Fare: Car 40,000 ZK (= US$20)
Semi-trailer, truck 120,000 ZK (= US$60)
Trailer 140,000 ZK (= US$70)
Traffic: Approx. 140 vehicles/day (Average of September 15 and 16, 2000)
Approx. 25,000 vehicles/year (in 2000)
Approx. 10,000 vehicles/year (in 1995) (Annual growth rate = 20%)
Source: Kazungula Bridge Construction Study Report (JICA, March 2003)
(Large vehicles take a detour from nearby Victoria Falls Bridge, where traffic control for large trucks is enforced)
Customs flow time: Short (at not loaded), one hour (at loaded)

Photo A-1  Pontoons
Photo A-2  Boarding
Photo A-3  On board
Photo A-4  Waiting trailers
(9 trailers were waiting on that day)
(c) Problems in the road transport sector

The trunk, main and district paved roads are indispensable for the development of Zambia’s economy. However, many other roads are unpaved and poorly maintained, and their sodden surfaces in the rainy season hamper car and pedestrian traffic.

According to the ROADSHIP II program, the entire core road network comprising 40,133 km will have been brought into a maintainable condition by the end of the 10-year period. However, other roads will be maintained as per “need” and priority. So, maintenance for community roads, even with many citizens using them, may be postponed.

The total cost for running ROADSHIP II from 2004 to 2013 is estimated at US$1.6 billion. Nevertheless, donor help is indispensable considering that revenue sources such as the fuel levy are not enough to cover the cost.
(2) Rail transport

Zambia’s railway network consists of two main systems: Zambian Railways and the Tanzania Zambia Railway Authority (TAZARA).

Zambian Railways has a total track length of about 1,266 km, of which 948 is the main line, and runs from the border with Zimbabwe in Livingstone in the south up to the border with the Democratic Republic of Congo, with branch lines in the Copperbelt. The Mulobezi Railway Line stretches from Livingstone to Mulobezi, in southwestern Zambia.

The TAZARA, which is jointly owned by the governments of Zambia and Tanzania, connects Zambia to the Great Lakes region and the seaport of Dar es Salaam in Tanzania. The track has a total length of about 1,700 km from Kapiri Mposhi to Dar es Salaam connecting to the Zambia Railways system at Kapiri Mposhi. TAZARA currently handles exports/imports of Tanzania and Zambia, as well as Malawi, DR Congo, the Great Lakes region, South Africa and Zimbabwe.

Zambia’s railway network suffers from two main operational constraints: poor track maintenance with respect to Zambia Railways, and low availability of main line locomotives and wagons in the case of TAZARA. The problems faced by the railways have resulted in considerably reduced service capacity and hence their present inability to attract traffic. The cost for rehabilitating and maintaining the railway system is generally much higher than that of the road transport system; therefore, it is necessary to study the best way to minimize the total transport cost considering the content and amount of goods, if the railway system is to be activated.

Figure A-3 Railroad network
(3) Air transport

There are 144 airports in Zambia, the main ones being Lusaka, Livingstone, Ndola, and Mfuwe. These airports are managed by the National Airport Corporation.

The EU has already extended the runway at Livingstone Airport from 2 km to 3 km because only Boeing 727s were able to land previously, and the expansion enabled Boeing 767s and 777s to land there also. Furthermore, repairs have already been completed at Lusaka Airport. Ndola Airport was originally built as a military airport during World War II, and therefore requires renovation.

The main airlines operating at the Lusaka Airport are Zambian Airways and Zambia Airwaves, which connect the major domestic cities (Lusaka, Ndola, Livingstone, Mfuwe, Chipata, Lower Zambezi) and neighboring countries (Johannesburg, South Africa – Harare, Zimbabwe – Lilongwe, Malawi – Lubumbashi, Congo) respectively.

South African Airways has approximately two flights per day between Johannesburg and Lusaka. However, this is being abolished now that British Airways provides direct flights from Heathrow Airport.

Figure A-4  Location of airports
(4) Inland water transport

The present contribution of inland water transport to the movement of goods and passengers in Zambia is not significant. The country has abundant navigable lakes and rivers but the development of this sector is inhibited by the lack of technical know-how in the management of inland waterways.

Currently, Mbulungu is the only major inland transit port, which enables Zambia to trade with other countries bordering Lake Tanganyika on the one hand and other SADC member states on the other. Facilities at the port are inadequate to meet the cargo throughput demand.

There is a need to develop Zambia’s lakes, rivers, ports, and harbors to increase the use of alternate transport modes and improve trade with neighboring countries.

Figure A-5  Location of Mbulungu Port
(5) **Corridors**

There is an urgent need to maintain corridors to export mineral resources from the inland countries and import necessary goods in SADC nations. According to the SADC Protocol on Transport, Communications and Meteorology, at least 7 corridors should be given priority for development.

The ⑥ Tazara, ④ Beira, and ① Southern and ⑤ Nacala corridors presently have strong ties to Zambia. They should be developed to further promote trade in the future.

---

**Table A-4  List of corridors**

<table>
<thead>
<tr>
<th>Name</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Southern Corridor</td>
<td>Durban Port, South Africa – Zambia-Congo</td>
</tr>
<tr>
<td>② Maputo Corridor</td>
<td>Maputo Port, Mozambique – South Africa</td>
</tr>
<tr>
<td>③ Walvis Bay Corridor</td>
<td>Walvis Port, Namibia – Botswana</td>
</tr>
<tr>
<td>④ Beira Corridor</td>
<td>Beira, Mozambique – Harare (– Lusaka)</td>
</tr>
<tr>
<td>⑤ Nacala Corridor</td>
<td>Nacala, Mozambique – Lilongwe (– Lusaka)</td>
</tr>
<tr>
<td>⑥ Tazara Corridor</td>
<td>Dar es Salaam, Tanzania – Lusaka</td>
</tr>
<tr>
<td>⑦ Lobito Corridor</td>
<td>Lobito, Congo – Zambia</td>
</tr>
</tbody>
</table>

Source: Regional Transport Infrastructure Development in South Africa, JBIC Review No. 2, November 2000
(6) Public transport in Lusaka

Public transport in the city of Lusaka consists of buses and taxis. The bus service includes both city and intercity buses.

Big buses are operated by private companies from the bus terminal in Lusaka City and provide intercity bus service, and vans called “mini-buses” are operated as city buses. Mini-buses do not follow a timetable, but instead are operated according to demand. Therefore, service does not start until the vehicle is full.

Taxi service can be obtained from the main shopping center, the hotel and communal facilities. Official taxis are registered by the Government and are painted light blue with a registration number along the side. Most taxis do not have a meter and passengers must negotiate the fare.

If the future traffic demand is covered by the mini-bus system, a new type of congestion may arise. Therefore, it will be necessary to introduce a large bus system on the trunk roads and to restrict the operation of mini-buses on trunk roads.

Photo A-5  Bus terminal for intercity bus  Photo A-6  Mini-bus terminal

Photo A-7  Bus stop  Photo A-8  Registered taxi
(7) Road Traffic

(a) Road traffic in the nationwide road network

According to the traffic on trunk, main and district paved roads in 2004, traffic on the roads connecting the north and south region is high with 2000–3000 vehicles/day observed on the Kafue – Lusaka – Kapiri Mposhi section. Traffic of 1000–2000 vehicles/day is observed near the border with Tanzania. (See Figure. A-1.)

(b) Road traffic in Lusaka City

Traffic of over 3000 vehicles/day is observed on the Great East Road in downtown Lusaka, and 2000–3000 vehicles/day near the Lusaka International Airport. (See Figure. A-1.)

According to the JICA “Implementation review study report on the project for improvement and maintenance of Lusaka City roads (Phase III) in the Republic of Zambia”, 5200 vehicles were counted at a 4-hour peak-time period on the Great North Road in September 2004. Assuming that the rate of 4-hour peak-time traffic to 24-hour traffic is 20%, the estimated daily traffic is about 26,000 vehicles. Furthermore, the number of registered cars is increasing; therefore, traffic in Lusaka is now higher than in 2004. In fact, we observed traffic congestion during our stay in Lusaka. The main reasons for this congestion are the passing of through traffic between the north and south on the Great North Road in downtown Lusaka and the in-flow traffic to the roundabout exceeds its capacity.

It is a concern that congestion, air pollution and traffic accidents will increase in the near future because of the increased traffic demand.

Table A-5  Traffic volume at Great North Road (4-hour peak time, Sept. 17, 2004)

<table>
<thead>
<tr>
<th></th>
<th>North→South</th>
<th>South→North</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>2,506</td>
<td>2,253</td>
<td>4,809</td>
</tr>
<tr>
<td>Buses/trucks</td>
<td>180</td>
<td>105</td>
<td>285</td>
</tr>
<tr>
<td>Trailers</td>
<td>23</td>
<td>68</td>
<td>91</td>
</tr>
<tr>
<td>Total</td>
<td>2,759</td>
<td>2,426</td>
<td>5,185</td>
</tr>
</tbody>
</table>

Source: Implementation review study report on the project for improvement and maintenance of Lusaka City roads (Phase III) in the Republic of Zambia, 2005
Chapter 4  Sectoral Development Strategies

(8) Organization

The Ministry of Communications and Transport (MOCT) is responsible for overall policy formulation and monitoring of the transport sector. The following departments are part of the MOCT:

- Road Transport
- Civil Aviation
- Maritime and Inland Waterways
- Government Communications Flight

In the past, the Ministry of Works and Supply (MOWS), Ministry of Local Government and Housing (MLGH), Ministry of Agriculture and Cooperatives (MACO) and Ministry of Tourism, Environment and Natural Resources (MTENR) were involved in construction, rehabilitation and maintenance of roads.

Road administrative reform was carried out because the vertical administrative structure had set off harmful effects. Now, the following ministries are in charge of road administration:

- Road Development Agency (RDA), under MOWS
  The RDA is responsible for the programming, procurement, monitoring and overall supervision of all road works in the country, i.e. trunk, main, district, urban, rural and feeder roads.

- Road Transport and Safety Agency (RTSA), under MOCT
  The RTSA is responsible for the implementation of policy on road transport and traffic management, road safety and enforcement of laws regulating road transport and safety in the country, programming, procurement, monitoring and evaluation of road transport regulations and safety programs.

- National Road Fund Agency (NRFA), under the Ministry of Finance and National Planning
  The NRFA is responsible for the collection, disbursement, management and accounting of the National Road Fund, reporting through the Ministry of Finance and National Planning to the Committee of Ministers on Road Maintenance Initiative (RMI).

Figure A-7  New road administration
(9) Expected New Projects by Agencies

The expected new projects, obtained by interview, are as listed in the following table. The most requested project is the construction of ring roads in Lusaka; next is construction of the Chembe Bridge and a road between Chingola – Kansashi, and rehabilitation of the road between Chipata – Lundazi. Most of these projects are located in rural areas.

Table A-6  Requested projects

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>Category</th>
<th>MOFA</th>
<th>MOCT</th>
<th>NRFA</th>
<th>MOWS</th>
<th>MLGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction of Chembe Bridge</td>
<td>Bridges</td>
<td>○</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Construction of sub-Sahara roads</td>
<td>Roads</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F/S on the construction of a railway line between Lumwana and a point on the Benguela Railway Line</td>
<td>Railways</td>
<td></td>
<td>○</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Provision of watercraft for passengers and cargo for Banweulu and Mweru water transport</td>
<td>Water transport</td>
<td></td>
<td></td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Construction of Ndola Airport</td>
<td>Airports</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Construction of Lusaka ring roads</td>
<td>Roads</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Rehabilitation of road between Kafue and Chirundu</td>
<td>Roads</td>
<td></td>
<td>○</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Construction of road between Nakonde and Mbala</td>
<td>Roads</td>
<td></td>
<td></td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Implementation of one-stop border</td>
<td>Others</td>
<td></td>
<td>○</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Construction of Kazungula Bridge</td>
<td>Bridges</td>
<td></td>
<td></td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Improvement and maintenance of Ndola and Kitwe city roads</td>
<td>Roads</td>
<td></td>
<td></td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Rehabilitation of Chingola – Kansashi road</td>
<td>Roads</td>
<td></td>
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<tr>
<td>13</td>
<td>Upgrading of Mansa – Luwingu road</td>
<td>Roads</td>
<td></td>
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<tr>
<td>14</td>
<td>Rehabilitation of Great East road</td>
<td>Roads</td>
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</tr>
<tr>
<td>15</td>
<td>Rehabilitation of Chipata – Lundazi road</td>
<td>Roads</td>
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</tr>
<tr>
<td>16</td>
<td>Construction of bypass between Lusaka and Chirundu</td>
<td>Roads</td>
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<tr>
<td>17</td>
<td>Technical assistance on road maintenance</td>
<td>Roads</td>
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<td>○</td>
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<td></td>
</tr>
<tr>
<td>18</td>
<td>Study on Greater Lusaka urban transport, water and sanitation improvement, and land use plan</td>
<td>Roads/water</td>
<td></td>
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<td>□</td>
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<tr>
<td>19</td>
<td>F/S on the construction of a railway line from Chipata to Tazara</td>
<td>Railways</td>
<td></td>
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<tr>
<td>20</td>
<td>F/S on the construction of a railway line between Nseluka and Mpulungu Port</td>
<td>Railways</td>
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<tr>
<td>21</td>
<td>F/S on the construction of a railway line between Mulobezi and the Caprivi Strip</td>
<td>Railways</td>
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<tr>
<td>22</td>
<td>F/S on the construction of a railway line between the towns of Kafue and the Lion’s Den.</td>
<td>Railways</td>
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<tr>
<td>23</td>
<td>Canal and waterway rehabilitation and development</td>
<td>Water transport</td>
<td></td>
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<tr>
<td>24</td>
<td>Upgrading of pavement, improvement of air space management, airport thermal facilities and human resource development in the civil aviation sector</td>
<td>Airports</td>
<td></td>
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<td>△</td>
<td></td>
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</tr>
<tr>
<td>25</td>
<td>Upgrading of the Leopards Hill – Chiawa – Chirundu road</td>
<td>Roads</td>
<td></td>
<td></td>
<td>△</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Upgrading of the Lundazi - Chama road</td>
<td>Roads</td>
<td></td>
<td></td>
<td>△</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Upgrading of Pedicile Road</td>
<td>Roads</td>
<td></td>
<td></td>
<td>△</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

○: Verbal explanation; △: Request list; □: One of the projects described on the list obtained by JICA’s Zambia office
Figure A-8
Location of project
(Roads/bridges)
Figure. A-9
Location of project
(Rail / Air / Inland water)
A-2 Development policy for improvement of the transport sector

The following are the main problems in the transport sector in Zambia:

- Some main roads that cross through Zambia are paved and maintained, but many others are unpaved and poorly maintained.
- In the rainy season, those roads with sodden surfaces interfere with car and pedestrian traffic. These conditions make it difficult for residents to access the market, public facilities and so on, and thus worsen the lifestyle of the people.
- Considerable funds are necessary to construct, rehabilitate and maintain the roads. It is impossible to fulfill all requests with the limited budget.
- Other transport modes such as railway and inland waterway are not developed or well maintained. Therefore, their mode share is low.

The development policy to improve the transport sector is as follows:

- In order to use the limited budget effectively, roads or other transport links with a high level of convenience should be constructed in turn:
  - Undeveloped road links at the core network
  - Community roads in urban areas
  - Corridors that are indispensable for exporting goods
  - Roads for promoting agriculture, etc.
- In order to construct the above-mentioned links, it is necessary to understand the link conditions such as the road surface and roadside conditions, the present and future traffic demands, as well as the future master plan and strategy.
- It will be necessary in the future to promote a “modal-mix policy”, whereby various transport modes collaborate to optimize transport costs.
A-3 Proposed projects

The following 2 projects are proposed, referring to the results of meetings with relevant ministries and information obtained in Zambia.

(1) Master plan for transport in Lusaka

The Lusaka urban area comprises 11.4% of the national population with 1,256,000 inhabitants in 2004 and continuous migration from other areas. Many migrants live in low-income residential areas known as “compounds”. These regions are slow to receive city infrastructure maintenance, and thus the poor conditions worsen the lifestyle of the people living there.

On the other hand, the number of registered cars increases every year, and so does the traffic. Road congestion is already apparent in Lusaka, and social loss is anticipated due to increased air pollution, traffic accidents, etc. In addition, trailers and trucks pass through downtown Lusaka on the trunk road connecting the northern and southern part of Zambia, adding to the traffic congestion.

The Lusaka City Council has a land use regulation entitled “Town and Country Planning”, but lacks a road traffic master plan for the Lusaka urban area.

For this reason, a road traffic master plan study should be implemented considering future land use and public transport priority policy; in addition, a feasibility study would be implemented considering the priority projects.

(2) Master plan for transport in Zambia

The number of registered cars increases every year in Zambia, and so does the traffic. On the other hand, the development and improvement of transport infrastructure such as roads, railways and harbors do not progress accordingly, which limits the conditions for development in the country, the expansion of production and the promotion of trade. The reduction of transport costs is important considering price competitiveness for inland Zambia in the international market.

Therefore, a national transport master plan study should be implemented in order to establish a mid/long-term transport policy as well as a transport infrastructure development/improvement policy with emphasis on regional development and strengthening the corridors that support and promote the export industry.
B Agriculture Sector
B. Agriculture Sector

B-1 Outline

Zambia has potential to expand agricultural production given the vast resource endowment in terms of land, labour and water that the country possesses. Of Zambia’s total land area of 75 million hectares (752,000 square Km), 58 % (42 million hectares) is classified as medium to high potential for agricultural production, with rainfall ranging between 800 mm to 1,400 mm annually and suitable for the production of a broad range of crops, fish, and livestock. It is estimated that only 14 % of total agricultural land is currently being utilized.

Zambia has the best surface and underground water resources in Africa, with many rivers, lakes, and dams. This, with the addition of high potential underground water aquifers in many areas, offers excellent prospects for irrigation programmes. However, these water bodies are largely unexploited. Of the country’s irrigation potential conservatively estimated at 423,000 hectares, only about 50,000 hectares are currently irrigated. Therefore, Zambia has a resource endowment for development of a wide range of crops, livestock, and fish given the diversity of its agro-ecological zones.

The country is divided into three major agro-ecological regions, namely Region I, II and III. Rainfall as well as the quality of soils differs across these regions.

Region I:
This region receives less than 800 m of rainfall annually and constitutes 12 % of Zambia’s total land area. It consists of loamy to clayey soils on the valley floor and course to fine loamy shallow soils on the escarpment. It covers the Southern province and parts of Eastern and Western provinces. The Region is suitable for production of drought resistant crops like Cotton, Sesame, Sorghum and Millet and has potential for production of irrigated crops, like Winter Maize. This Region is also suitable for extensive cattle production and has limited potential for Cassava cultivation. The valley part of the region is on a low altitude and is consequently hot and humid: these areas are not suitable for cattle rearing because of Tsetse Flies.

Region II:
The Region receives between 800 to 1,000 mm of annual rainfall and constitutes 42 % of the country. It is sub divided into two namely, Region Ila and Iib. Region Ila covers the Central Lusaka, Southern and Eastern fertile plateaux of the country and generally contain inherent fertile soils. Permanent settled systems of agriculture are practised. A variety of crops are grown in this Region and these include Maize, Cotton, Tobacco, Sunflower, Soya beans, irrigated Wheat, Groundnuts and other arable crops. The area is also highly suitable for flowers, Paprika and vegetable production. Region Iib covers Western province and consists of sandy soils. It is suitable for production of Cashew nut, Rice, Cassava and Millet, including...
vegetable and timber production. The Region is also highly suitable for Beef, Daily and Poultry production.

**Figure B-1 Agro-ecological Regions**

**Region III:**
The region receives more than 1,000 mm up to 1,500 mm of rainfall annually and constitutes 46 % of the country’s total land area comprising the Copperbelt, Luapula, Northern and Northwestern provinces. With the exception of the Copperbelt, the Zone is characterized by highly leached, acidic soils. It has good potential for the production of Millet, Cassava, Sorghum, Beans and Groundnuts. Coffee, Sugarcane, Rice and Pineapples are also grown in this area. The agricultural potential of the Region can be enhanced by application of lime and its perennial streams can be utilized for small-scale irrigation. Increased exploitation of the fisheries resources and introduction of fish farming, offer good opportunities for development.

The agricultural sector is key to the development of the Zambia economy and will be the engine of growth for the next decade and beyond. Agriculture generates between 18-20 % of the Gross Domestic Product (GDP) and provides livelihood for more than that 50 % of the population. The sector absorbs about 67 % of the labour force and remains the main source of income and employment for rural women who constitute 65 % of the total rural population. Increase in rural incomes will therefore result in overall poverty reduction and increased food security.

Existing reports, such as the Living Conditions Monitoring Survey of 1998 by the Central Statistical Office (CSO), indicate that Zambia is faced with high levels of poverty, with overall
poverty of 72.9 % of the national population in 1998. Income levels have also drastically declined with low formal employment. Given the abundant natural resource base, agriculture offers the greatest potential for generating growth and increasing employment and incomes. Smallholder farming represents a large potential resource for increased agricultural production and poverty reduction. However, realizing this potential will require an enabling and conductive policy environment.

Concerted efforts have been made since 1992 to liberalize the agricultural sector. Notable policy measures undertaken include the liberalization of agricultural marketing for all inputs and products including exports, the privatization of all former agro parastatals and increased private sector participation in commodity marketing and input supply and restructuring of the Ministry of Agriculture and Cooperatives (MACO). There is however an unfinished policy agenda for the sector given existing major constraints and challenges. These include; poor service delivery particularly for small-scale farmers, marketing constraints especially in outlying areas as a result of poor infrastructure notably feeder roads, a void in agricultural finance and credit, weak regulatory framework and poor enforcement of legal framework, unfavourable world and regional markets, and poor accessibility and administration of land in Zambia. There constraints need to be seriously and urgently addressed if agriculture is to develop.

B-2 Constraints

Agricultural growth has been below its potential due to a number of constraints. The following are some of the constraints that need to be addressed in order to increase production and economic growth in the sector:

- Low productivity - due to lack of access to resources and agricultural service support and loss of draught power;
- High dependence on rain fed agriculture and related risks, and limited utilization of irrigation;
- High post-harvest losses;
- Deficiencies in the early warning system and inadequate strategic food reserves;
- Limited diversification of agricultural production;
- High incidence of crop and livestock pests and diseases;
- Inadequate infrastructure and high energy/transport costs leading to poor market access by farmers resulting in loss of income and poor access to inputs;
- Limited access to affordable credit especially for medium and long-term investments;
- Poor functioning agricultural grain markets, which limit small farmers to access markets;
- Restrictive trade policies which affects price volatility and regional specialization;
- Limited domestic market;
- Security of land tenure and land acquisition issues;
Poor coordination of agricultural and food security programmes - there has been poor coordination of the various interventions being implemented by government, NGOs and cooperating partners;

Limited mainstreaming of gender in agriculture - despite women being major food producers, their access to productive resources and services is limited leading to low productivity;

Environmental degradation due to unsustainable agricultural practices;

The loss of labour due to the impact of HIV/AIDS, which has been undermining households’ income generating and food security activities;

Low purchasing power of the majority of the population;

Lack of an enabling environment.

B-3 Policy


President Levy Patrick Mwanawasa, SC has year 2004 approved the National Agricultural Policy (NAP). The approved Policy is aimed at providing a conducive environment for the growth of the agricultural sector up to 2015.

Past agricultural policies were restrictive and constraining with strong government intervention and participation. In addition, the strategies pursued were not sustainable because of their heavy reliance on subsidies. Consequently, these policies and strategies failed to stimulate growth in the sector. Up to early 1990s, the sector was poorly developed and dominated by a single crop—maize. The sector also lacked private sector participation in the areas of agricultural marketing, input supply and processing.

In 1992, the government embarked on agricultural sector policy reforms, which were part of the overall economic reforms pursued under the Structural Adjustment Programme. The main policy thrust of the reforms was liberalization of the agricultural sector and promotion of private sector participation in production, marketing, input supply, processing and credit provision.

Government recognizes the dual nature of the agricultural sector in which the vast majority of small-scale farmers is resource poor, have low production and productivity and are usually food insecure.

The main thrust of the National Agricultural Policy are increased production, sector liberalization, commercialisation, promotion of public and private sector partnerships and provision of effective services that will ensure sustainable agricultural growth. In doing so, the Government will not ordinarily intervene in inputs distribution or crop marketing in a way that will undermine or undercut private sector participation especially if the private sector has the will or capacity to do so.

The vision for the agricultural sector is “to promote development of an efficient, competitive
and sustainable agricultural sector, which assures food security and increased income”. It recognises the need to strengthen and expand the emerging opportunities and to also deal with the challenges facing the agricultural sector. This vision also strives to contribute to the overall goal of the Poverty Reduction Strategy Paper (PRSP), which is to achieve “poverty reduction and economic growth”.

In line with this vision, the specific objectives of the agricultural sector are:

- To assure national and household food security
- To ensure that the existing agricultural resource base is maintained and improved upon
- To generate income and employment to maximum feasible levels
- To contribute to sustainable industrial development and
- To expand significantly the sector’s contribution to the national balance of payments.

To achieve the above objectives, the strategies include:

- Strengthening and monitoring the liberalization of markets and facilitating private sector development.
- Strengthening the capacity of agencies handling agricultural products for export in ensuring that the products meet the standards and sanitary and phytosanitary requirements for export markets.
- Promoting and securing access of agricultural products to both local and international markets.
- Diversification of agricultural production and utilization.
- Strengthening and facilitating the provision of agricultural services.
- Reviewing and realigning institutional and legislative arrangements.
- Facilitating availability of and accessibility to land for agriculture and development of infrastructure in potentially productive agricultural areas.
- Development and promotion of appropriate technology.
- Promotion of gender equity in resource allocation and access to agricultural services focusing more on women and young farmers.
- Promotion of sustainable and environmentally sound agricultural practices.
- Prevention and control of pests, crop and livestock diseases of national economic importance.
- Promoting conservation of fisheries resources.
- Strengthening emergency preparedness through early warning and timely and efficient crop forecasting.
- Promotion irrigation development.
- Promotion and strengthening Cooperatives and Farmer Organizations as a vehicle for agricultural development.
- Facilitating provision of incentives for local and foreign agricultural investment.
• Strengthening information collection and dissemination.
• Re-enforcing the sector’s regulatory functions; this will also include liaising or coordinating with the appropriate institutions or bodies responsible for the regulation of the use of biotechnology and the resulting products, particularly Genetically Modified Organisms (GMOs).
• Maintaining agro-biodiversity and promoting conservation of aquatic eco-system and sustainable utilization of natural resources.

Under the agricultural vision and proposed policies, both food and cash crops will be targeted to increased production and productivity in order to attain and sustain food security and income generation, taking into account agro-ecological conditions. It is expected that an increased number of small scale farmers will be fully integrated in commercial production through outgrower arrangements or as individuals.

Overall, crop production increases will come from expansion of area under cultivation; expansion of irrigable land; increased productivity through improved variety releases and better research/extension linkages; increased use of better and sustainable farming practices including conservation farming, crop rotation, and low input agriculture; increased use of animal draught power. Appropriate post-harvest technologies will be put in place to improve post-harvest management and utilization.

Given Zambia’s resource endowment, diversification of agriculture will be promoted taking into account the comparative advantage in crops, livestock and fisheries (including aquaculture) production.

The main thrust in the livestock sector will be to control livestock diseases, re-stocking, management and improved quality of marketable livestock and livestock products especially in the “traditional” sector. Breeding will also be enhanced.

For fisheries, the focus will be to promote community based resource management of capture fisheries thereby improving catches. Concerted efforts will also be made to promote aquaculture development. Better marketing and processing facilities will be promoted and the distribution network improved.

Notwithstanding the emphasis on the development of small-scale farmers, support and provision of a conducive environment will be provided for the growth of the large scale-farming sector in order to maximize the synergies between the two. Small-scale farmers will, through relevant legislation, be encouraged to form and register co-operatives and other farmers’ organizations. Emphasis will be on primary and district level farmer organizations.

Government will focus on providing public goods that are needed for efficient sector growth such as rural infrastructure, basic research, epidemics and pest control. Agribusiness will be encountered to strengthen linkages with smallholder service delivery with emphasis on decentralization of service provision.

Increasingly, the role of the public sector will be confined to policy formulation, enforcement of
legislation, regulation and inspection, maintenance of the strategic reserves, provision of market information, financing the control of pests and diseases of national economic importance, provision of agricultural services i.e. research and extension in partnership with the private sector, provision of targeted support to outlying areas and underprivileged farmer groups, capacity building within public and private organizations, and monitoring and evaluation of overall sector performance including projects, programmes, and sector coordination.

The Ministry responsible for agriculture will also endeavour to increasingly commercialize some services it is currently providing including cost sharing. There services include research, extension, soil and seed testing and agricultural training. Emphasis will be on developing partnerships between government and farmers, the private sector, NGOs and cooperation partners.

All these measures are expected to result in the following: attainment of food security for the majority of households; agriculture’s contribution to total foreign exchange earnings will increase from the current 3-5 % to 10-20 % by 2015; agriculture will grow at between 7-10 % pre annum from 2005 onwards; overall agricultural contribution to GDP will rise form the current 18-20 % to over 30 % by 2015; and agriculture will be the leading sector in terms of employment and income generation. Overall, these attainments will place agriculture as the leading sector in terms of food security, economic growth and poverty reduction.

In the implementation of the Policy a number of risks and assumptions have been noted. It is recognized that factors outside the Ministry of Agriculture and Co-operatives or the Agricultural Sector in general, such as the state of the road network, land tenure and administration, energy, communication, HIV/AIDS and world markets, have a profound impact on the development of the Sector. There is, therefore, need to remove or minimize constraints in these key areas for the sector to develop and to encourage cross-sectoral dialogue and actions. HIV/AIDS is rapidly becoming the number one constraint to economic development in general and the agricultural sector in particular. The disease has a negative impact on agricultural production. The problem requires attention by the Ministry in various ways including modification of extension and research priorities, incorporation of HIV/AIDS related information in extension messages and encouraging introduction of HIV/AIDS in the curricula of agricultural training institutions.

In addition, the successful implementation of the Policy assumes that:

- The Ministry, in particular and the Agricultural Sector, in general would be adequately funded and equipped.
- Ministry staff would be provided with attractive remuneration and incentive packages.
- There would be policy consistency and /or continuity.
- Weather conditions would be favourable before irrigation is fully developed, especially among the small-scale farming community.
B-3-2 Fifth National Development Plan (2006-2010, Agriculture)

The Fifth National Development Plan (2006-2010) will strive to contribute to the achievement of the goal of the agricultural sector through the implementation of a number of proposed programmes. Role of the public sector will be to encourage growth in the agricultural sector by fulfilling those functions which are truly public goods. It will formulate and implement policies to create an enabling environment, which encourages the participation of the private sector, NGOs and cooperating partners. The plan has the following specific priority objectives:

1. To formulate and implement appropriate strategies through multi-sectoral and coordinated interventions with a focus on increased food security and economic growth
2. To promote the development of a competitive, efficient and transparent public and private sector driven marketing system for agricultural commodities and inputs
3. To promote the improvement of agricultural land for sustainable production and productivity
4. To promote a well-regulated and profitable irrigation sub sector that is attractive to both the public and private sector
5. To improve the productive efficiency of the livestock sector in a sustainable manner and support the marketing of both livestock and livestock products and contribute to food security and income
6. To provide efficient and effective technology development and transfer services to assist farmers increase agricultural production and productivity and diversify crop production and utilization
7. To increase fish production and promote sustainable utilization of fisheries resources thereby contributing to the economy through the generation of employment, income and improved availability of fish
8. To create an enabling environment for the development of autonomous, transparent, viable and demand-driven co-operatives and other farmer organizations that will contribute to economic growth and poverty reduction
9. To provide skilled human resource for the agricultural sector through capacity building in order to increase the sector’s production and productivity.

The followings present the proposed programmes.

1. Policy formulation and coordination programme
2. Agricultural Marketing, Trade and Agribusiness Development Programme
3. Agricultural Infrastructure and land development Programme
4. Irrigation Development and Support Programme
5. Animal Health Programme
6. Livestock Research and Development Programme
7. Livestock Production, Training & Extension Programme
8. Livestock Marketing and Trade Programme
9. Agricultural Research and Technology Development
10. Agricultural Extension
11. Agricultural Seed Support Programme
12. Farm Power and Mechanization Programme
13. Aquaculture Development Programme
14. Capture Fisheries Management and Development Programme
15. Fish Processing and Marketing Programme
16. Fisheries Training Programme
17. Fisheries Coordination and Management Programme
18. Cooperative Development Programme
19. Human Management and resource development programme

The programmes and activities will be monitored based on the indicators developed. Other main monitoring indicators and instruments can be developed or refined as the programme is implemented. The more comprehensive impact evaluations will require household surveys to be conducted by institutions like CSO in collaboration with MACO. This shall be complemented by independent assessments from stakeholders on sector performance and programme implementation. A system for gathering both quantitative and qualitative information at national, provincial and district level in order to regularly monitor implementation and measure the impact of the programme activities will be essential. Agricultural growth will principally be driven by commercial agriculture from both large and smallholder strongly linked to commodity value chains such as cotton, coffee, tobacco and horticultural crops.

All these measures are expected to result in the following:

- Attainment of food security for the majority of households with at least 90 percent of population being food secure by 2010.
- Agriculture’s contribution to total foreign exchange earnings will increase from the current 3-5% to 10-20% by 2010.
- Agriculture will grow at 10% per annum from 2006 onwards.
- Overall agricultural contribution to GDP will rise from 18-20% to 25% by 2010. The share of crops, livestock and fisheries will thus increase.
- Increased incomes for those involved in the agricultural sector.

Overall, these attainments will make agriculture the leading sector in terms of food security, economic growth and poverty alleviation.
CONCLUSION

The effective implementation of the Agriculture Sector Programmes under the National Development Plan (2006-2010) will transform overall agriculture into a dynamic sector over time, which is expected to bring about significant positive changes in the national economy. In respect of time, the strategies in the Plan will be evaluated and reviewed in the context of overall economic condition of the country and changing agricultural production system, and accordingly measures will be taken to update the strategies.

The importance of promoting agricultural trade both in the region and beyond cannot be overemphasized. This is particularly so given developments in the Common Market for Eastern and Southern Africa (COMESA), Southern Africa Development Community (SADC), the African Caribbean and Pacific/European Union (ACP/UE) Cotonou Agreement and the World Trade Organization (WTO). Zambia will have to ensure that it takes full advantage of these developments and put in place measures that promote fair and beneficial agricultural trade.

To encourage more investment in the sector, the Plan particularly will place emphasis on facilitating efficient land administration by working closely with the Ministry of Lands. Other key players are the Ministries of Commerce, Trade and Industry, Energy and Water Development, Transport and Communications, Works and Supply, Tourism, Environment and Natural Resources and Finance and National Planning.

B-3-3 National Irrigation Plan (May 2005)

Taking into account the vulnerability of Zambia’s agricultural sector to weather and climatic vagaries, MACO has recently designed a National Irrigation Strategy that would provide guidance to all levels and types of investments in irrigated agriculture. It is now logical for MACO to develop a National Irrigation Plan (NIP) as part of the National Development Plan (NDP) that would run from 2006 to 2011 to specify a costed plan.

Zambia has a pervasive dependence on rains. It has therefore, from time to time suffered severe droughts, resulting in reduced crop yields and livestock losses. Both agricultural production and productivity have shown high vulnerability to adverse weather patterns with cyclical trends in national harvest a pattern of alternating surpluses and food deficits. The overall macro-economic growth and welfare indicators are sensitive to the availability or absence of food surpluses and deficits. There is an urgent need to break this pattern especially that Zambia possesses tremendous land and water resources.

Zambia has over 1,740,380 million cubic metres of underground water resources and possesses over 423,000 ha of irrigable land of which about 100,000ha is actually irrigated among large scale, emergent and smallholder farmers.

Government has in recent past decided to transform the potential of irrigation into a reality to achieve food security, enhance income and employment generation opportunities. Through this
NIP, MACO is proposing a package of interventions that once implemented, will break the cycle of vulnerability that Zambia is exposed to. The NIP proposes a strategy for full, efficient and sustainable exploitation of both surface and underground water resources by promoting irrigation in its various forms and targeted at the different farmer types to ensure all round agricultural production of food, cash, export and industrial crops.

Establishment of an Irrigation Development Fund (IDF): The IDF would be a source of capital for investment in irrigation-related projects and acquisition of technology by farmers and industry operators.

The Ministry of Agriculture and Cooperatives (MACO), through the Technical Services Branch (TSB) shall remain the main technical, regulatory and monitoring custodian of the NIP interventions. However, different components shall be contracted or placed under special institutional arrangements to facilitate access by all stakeholders.

In the medium to long term, the IDF would also cater for the financing of communal water supply systems of a public nature, for irrigation drawing from existing water bodies like lakes, rivers, dams, canals, etc. Groups of farmers in high irrigation potential areas and with proven linkages to markets can approach the Rural Investment Fund (RIF) that would manage this component of the IDF.

The Government has shown a lot of political will and leadership since the drought of 2001 by exploring various ways to promote off season cultivation. The IDF is not a far-fetched idea and could pay for itself once stimulated with such a fund commitment on higher scale.

Given the potential benefits to the national economy, the NIP should be a home grown and Government-owned Initiative financially supported through the National Treasury as special programme or Fund under NDP. The total direct resource commitment is estimated at US$150million for the five-year period. Table below gives a breakdown of the resource allocation:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>US $</th>
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</thead>
<tbody>
<tr>
<td>Irrigation Development Fund (IDF)</td>
<td>113,020,833</td>
</tr>
<tr>
<td>Infrastructure Development (public)</td>
<td>18,000,000</td>
</tr>
<tr>
<td>Institutional and Social</td>
<td></td>
</tr>
<tr>
<td>Capacity building of MACO Extension</td>
<td>13,735,833</td>
</tr>
<tr>
<td>Capacity Building - Farmer Organisations</td>
<td>2,812,873</td>
</tr>
<tr>
<td>Capacity Building - Out Grower Promoters</td>
<td>115,200</td>
</tr>
<tr>
<td>Strengthen Irrigation research capacity</td>
<td>1,836,000</td>
</tr>
<tr>
<td>Capacity building -Technology Development and Advisory Unit – UNZA</td>
<td>480,000</td>
</tr>
<tr>
<td>Grand Total</td>
<td>150,000,739</td>
</tr>
</tbody>
</table>
Irrigated area could be increased by about 70,000 ha of which 10,000 ha among large scale commercial, 30,000 ha among emergent farmers and 30,000 ha among small scale farmers. Incremental production based on this irrigation hectarage would result in guaranteed food for strategic reserves, reduction in food imports, export of surplus food, export of high value cash and increased industrial outputs and employment.

A simple calculation shows that if all this hectarage was committed to maize which is not a high value crop, at highly conservative price of US$150/ton and average yield of 4 ton/ha, the programme would raise a gross income of US$42 million against a proposed investment of only US$30 million.

**B-3-4 Organization Structure of Ministry of Agriculture and Cooperatives**

Organization Structure of Ministry of Agriculture and Cooperatives is shown on the following page.
Figure B-2 ORGANIZATIONAL STRUCTURE OF THE MINISTRY OF AGRICULTURE AND COOPERATIVES

MINISTER
(Mr. Mundia Sikatana)

Deputy Minister
(Mr. James Katoka)

Deputy Minister
(Mr. Alexis Luila)

Permanent Secretary
Agriculture Division
(Mr. Richard Chizyuka)

Permanent Secretary
Cooperatives & Marketing Development Division
(Dr. Sam Mundia)

Department of Agriculture
Director: Dr. W. Mwale
Deputy: Mr. M. Mwale

Department of Fisheries
Director: Mr. G.T. Magupu
Deputy: T. Zulu (fisheries)

Seed Control & Certification Institute
Director: Ms. M. Chipili
Deputy: Ngalando (research)

Department of Cooperatives Development
Director: Ms. A.M. Sihwala
Deputy: G. Mbozi

Department of Agribusiness & Marketing
Director: (vacant)
Deputy: G. Mbozi

Veterinary & Livestock Development
Director: Mr. T.M. Akayombokwe
Deputy: (Extension) Dr. Kaona
Deputy: (TSB) Sichembe

Agriculture Research Institute
Director: Mr. A. Chalibesa
Deputy: Mr. M. Mwale

FRA
Chairman: Mr. C. Chitata

Common User Departments

Provincial & District Coordinating Offices

1. Eastern – Mr. O. Kabanda
2. Central – Mr. P. Chisulo
3. Copperbelt – Ms. Nidulu
4. Luapula – Mr. W.S. Kalumba
5. Lusaka – Mr. Mungalaba
6. Northern – Mr. L. Lyembeni
7. Northwestern – Mr. Jekne
8. Western – Dr. Simaianga
9. Southern – Dr. Songolo

National Agriculture Information Services
Acting Head: Mr. E. Katowezi

PACOs
B-4 Proposed Project

B-4-1 Proposed Project by Ministry of Agriculture and Cooperatives

Proposed Projects by Ministry of Agriculture and Cooperatives are shown in Table B-2.
### Table B-2: Proposed Project by Ministry of Agriculture and Cooperatives

<table>
<thead>
<tr>
<th>Priority</th>
<th>Implementing Agency</th>
<th>Sector</th>
<th>Scheme</th>
<th>Project Name</th>
<th>Project cost (US$)</th>
<th>Project Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MACO, Technical Services Branch, Irrigation Engineering Section</td>
<td>Agriculture</td>
<td>OGA</td>
<td>Pilot Agricultural Commercialization Project (Ngaona Smallholder Irrigation Scheme)</td>
<td>4,338,750</td>
<td>30 km from Lusaka on north-western side of Mutili hills in Mazabuka district</td>
</tr>
<tr>
<td>A</td>
<td>MACO, Technical Services Branch, Irrigation Engineering Section</td>
<td>Agriculture</td>
<td>OGA</td>
<td>Strengthen Irrigation Research capacity at Nanga</td>
<td>1,856,000</td>
<td>Approx. 24 km from Mazabuka district Roma</td>
</tr>
<tr>
<td>Submitted</td>
<td>MACO-Policy and Planning</td>
<td>Agriculture</td>
<td>KR2</td>
<td>Fertilizer Support Project for Small-scale Farmers by the increase of Food Production</td>
<td>3,000,000</td>
<td>Northern, Lusaka and Central Province</td>
</tr>
<tr>
<td>Submitted</td>
<td>MACO: Department of Veterinary and Livestock Development</td>
<td>Agriculture</td>
<td>Other</td>
<td>Controlling Foot and Mouth Disease through consistent vaccinations</td>
<td>5,978,083</td>
<td>Southern, Central, Lusaka and Northern Provinces</td>
</tr>
<tr>
<td>B</td>
<td>MACO: Department of Veterinary and Livestock Development</td>
<td>Agriculture</td>
<td>DS</td>
<td>Eradication of Tsetse flies from the Western Belt of Zambia</td>
<td>19,121,140</td>
<td>Western and Southern Provinces</td>
</tr>
<tr>
<td>A</td>
<td>MACO/NAIS</td>
<td>Agriculture</td>
<td>Other</td>
<td>Field Recording Equipment</td>
<td>Portable Recorders 72 sets</td>
<td>72 District centres</td>
</tr>
<tr>
<td>B</td>
<td>MACO/NAIS</td>
<td>Agriculture</td>
<td>Other</td>
<td>Self powered (Wind-Up Solar radio sets)</td>
<td>Wind-Up solar radio 1000 sets</td>
<td>5 Provinces, Eastern, Lusaka, Southern, Western Expansion of the project</td>
</tr>
<tr>
<td>B</td>
<td>MACO/NAIS</td>
<td>Agriculture</td>
<td>Other</td>
<td>Literature production (Farmers Diary)</td>
<td>Farmers' Diaries 6000 copies</td>
<td>Country wide</td>
</tr>
<tr>
<td>B</td>
<td>MACO-Agriculture (Extension Branch)</td>
<td>Agriculture</td>
<td>TA</td>
<td>Capacity Building of small scale women and young farmers in crop and food processing technologies</td>
<td>2,000,000</td>
<td>Southern, Western, Eastern and North Western Provinces</td>
</tr>
<tr>
<td>Submitted</td>
<td>MACO, Technical Services Branch</td>
<td>Agriculture</td>
<td>TA</td>
<td>Per-urban Irrigation Development Project</td>
<td></td>
<td>Lusaka district</td>
</tr>
<tr>
<td>B</td>
<td>MACO</td>
<td>Agriculture</td>
<td>Other</td>
<td>Rehabilitation of food grain storehouse</td>
<td></td>
<td>Chambishi, Masanfu, Mitiris, Chingola, Mumbwa, Kalomo</td>
</tr>
<tr>
<td>B</td>
<td>MACO, Technical Services Branch</td>
<td>Agriculture</td>
<td>DS</td>
<td>Small scale Irrigation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sector:** Agriculture  
**Health**  
**Human Resource**  
**Economic Development**  
**Other**  

**Scheme:** OGA  
**TA**  
**Expert**  
**DS**  
**KR**  
**KR2**  
**NPGA**  
**Training**  
**Volunteer**  
**Other**
B-4-2 High Priority Projects

(a) Pilot Agricultural Commercialization Project

i) Introduction
The farmers of the Nega-Nega basin have for years had a keen eye on the water resources of the Kafue River which flows some 12 km from its reach. A number of projects have been identified for development without any coming to fruition so far. This project takes the idea of bring water from the Kafue to the Nega-Nega basin closer to reality by examining the engineering issues and the cost implications of such a project.

ii) Project Area
The main project area, gross of 26,820 ha, encompasses the whole catchment of the Nega-Nega River, which is bounded by the Muvuma Hills (Munali) on the east, the railway on the north, and the watershed hills on the west. The project area crosses the main Lusaka Mazabuka road in the south of about 5.0 km. The tribal land on the east of the Muvuma Hills is also included as much arable land is available for irrigation.

The elevation of the project starts at 977 m at the Kafue River and rises to 1,170 m in the south-west. Most of the irrigable land is below 1,090 m, a lift of 113 m.

The Project comprises a mixture of traditional farmers, medium scale farmers, small scale farmers and large scale farmers with the following percentages:

<table>
<thead>
<tr>
<th>Farm Type</th>
<th>Area (ha)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>5,681</td>
<td>21 %</td>
</tr>
<tr>
<td>Small Scale</td>
<td>7,767</td>
<td>29 %</td>
</tr>
<tr>
<td>Medium Scale</td>
<td>2,679</td>
<td>10 %</td>
</tr>
<tr>
<td>Large Scale</td>
<td>10,691</td>
<td>40 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>26,819</td>
<td>100 %</td>
</tr>
</tbody>
</table>

iii) Rainfall and Crops

① Rainfall and Irrigation
The mean annual rainfall is 744 mm which is similar to that obtained at Nanga Farm to the north west of the project area. The area just to the west of the Muvuma Hills is considered to fall in the rain shadow so may get slightly less rainfall that the mean of 744 mm.

② Crop Water Requirements
The following crops have been considered suitable for production using irrigation in the project area: sugar cane, cotton, sugar beans, wheat and coffee. Cotton and beans are both summer crops but both would benefit from supplementary irrigation before and after the main rain
months. The crops considered are those where there is an available market for the produce. Crops such as vegetables are not considered suitable for large scale production as the market is very uncertain. The maximum demand duty is 0.95 l/s/ha in November for sugar cane followed by 0.93 l/s/ha in October for mature coffee. It is anticipated most of the area will be planted with wheat which has a maximum demand of 0.79 l/s/ha in August. The project design duty has been taken as 0.83 l/s/ha as a weighted average.

iv) Facility Plan and Cost

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lift Canal and Pump Station</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earthworks for canal</td>
<td>m³</td>
<td>409,672</td>
<td>3.00</td>
<td>1,229,017</td>
</tr>
<tr>
<td>Pump Station</td>
<td>No.</td>
<td>10</td>
<td>264,000</td>
<td>2,640,000</td>
</tr>
<tr>
<td>2 Canals, Concrete Parabolic Structures</td>
<td>m</td>
<td>29,825</td>
<td>51.56</td>
<td>1,537,777</td>
</tr>
<tr>
<td>3 Pipelines</td>
<td>m</td>
<td>8,172</td>
<td>300</td>
<td>2,451,600</td>
</tr>
<tr>
<td>4 Primary Pumping Stations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1, 4 Pumps, 0.69 m³/s @ 25 m TDH</td>
<td>No.</td>
<td>1</td>
<td>1,030,000</td>
<td>1,030,000</td>
</tr>
<tr>
<td>P2, 5 Pumps, 0.41 m³/s @ 40 m TDH</td>
<td>No.</td>
<td>1</td>
<td>1,030,000</td>
<td>1,030,000</td>
</tr>
<tr>
<td>5 Holding Ponds</td>
<td>No.</td>
<td>9</td>
<td>66,000</td>
<td>594,000</td>
</tr>
<tr>
<td>6 Irrigation, On-Farm Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centre Pivot</td>
<td>ha</td>
<td>1,770</td>
<td>2,100</td>
<td>3,717,000</td>
</tr>
<tr>
<td>Hand Moved</td>
<td>ha</td>
<td>2,540</td>
<td>1,650</td>
<td>4,191,000</td>
</tr>
<tr>
<td>Drip</td>
<td>ha</td>
<td>280</td>
<td>2,800</td>
<td>784,000</td>
</tr>
<tr>
<td>7 Operation Infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roads</td>
<td>m</td>
<td>20,636</td>
<td>60</td>
<td>1,238,160</td>
</tr>
<tr>
<td>Staff Housing</td>
<td>No.</td>
<td>1</td>
<td>114,750</td>
<td>114,750</td>
</tr>
<tr>
<td>Office</td>
<td>No.</td>
<td>1</td>
<td>250,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Workshop</td>
<td>No.</td>
<td>1</td>
<td>350,000</td>
<td>350,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>No.</td>
<td>1</td>
<td>224,800</td>
<td>224,800</td>
</tr>
<tr>
<td>Transport</td>
<td>No.</td>
<td>1</td>
<td>287,425</td>
<td>287,425</td>
</tr>
<tr>
<td>8 Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveying, Design, setup</td>
<td>% sum</td>
<td>2.5 %</td>
<td>546,638</td>
<td></td>
</tr>
<tr>
<td>Contingencies</td>
<td>% sum</td>
<td>5.0 %</td>
<td>1,031,826</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>23,443,993</td>
</tr>
</tbody>
</table>

v) Operational cost and Water Charge

The water charge is very dependent on the cost pumping. The total volume and subsequently the total kW-hours has been estimated for each pumping station. A total of 68.68 million m³ will be pumped per year by each of the 10 lift stations, while P1 will pump 64.1 million m³ and P2 will pump 36.8 million m³. The total power consumed by all pump stations is 35.3 million kW-hours.

The following is the calculation for the water charge.

Total Annual Power consumed: 35.3 m kW-h
Chapter 4  Sectoral Development Strategies

Total Annual Volume 64.12 m³
Power consumed per m³ 0.55 kW-h/m³
Cost per kW-h US $ 3.23/kW-h
Cost per m³ US $ 1.78/m³
Overhead and loan factor 1.7
Water Charge US $ 3.02/m³

The cost per kW-h is based on recent ZESCO bills for Tariff MD1 and some MD2 meters used on Mubuyu Farm and converted at a rate of ZK 4,850=US$1.00. The factor of 1.7 used to increase the power cost is based on the ZSC factor used to charge Kaleya Smallholders, whose water charge is US $ 1.6/m³. This factor may seem a little high and needs further review.

(b) Refurbishment of the National Irrigation Research Station, Nanga

i) Current situation

Despite its huge potential, Zambia’s agriculture sector is not making a significant contribution to poverty reduction and overall growth of the economy. In 2000, Zambian GDP grew by 3.5 percent per year while the agriculture sector growth rate was only 1.8%. Agriculture sector growth rate is far lower than the population growth rate of 2.9 percent per year. Agricultural performance on smallholdings has been particularly constrained due to lack of access to resources, geographical isolation causing lack of access to services and markets, lack of productive assets such as oxen and mechanized farm implements, and the lack of labour due to decimation of productive labour by the HIV/AIDS pandemic.

From 1999, some 25 vegetable farms producing for both the domestic and export markets have failed with a total vegetable loss of 1,440 ha and a flower loss of 82 ha. Many of these large farms depended on smallholder out-growers to beef-up their vegetable export volumes. Most of these out-growers are smallholder irrigation farmers who depend on the support of the NIRS for planting materials and irrigation technology. A fully operational NIRS would contribute to the sustainability of smallholder production and recovery of some or all of the lost hectarage.

ii) Objectives of the project

**Overall Objective:** The overall objective of this proposed project is to refurbish the National Irrigation Research Station at Nanga thereby improving the capacity of the centre to carry out research activities more effectively.

**Specific Objectives:** The following are the specific objectives of this project:-
1. To procure and install new irrigation water pumping plant and to service and repair any existing serviceable water pumping plant.
2. To repair, renovate and construct new buildings as necessary for library, laboratories, stores, workshops, offices and living quarters.
3. To procure necessary farm machinery and equipment including tractors, ploughs, harrows and hand implements.
4. To repair water storage, conveyance and distribution structures for domestic and irrigation purposes.
5. To procure and install field irrigation equipment including sprinklers and drip systems.
6. To open up land for research and commercial seed and food crop irrigated production.
7. To sponsor research personnel and station support staff to attend appropriate courses locally, regionally and internationally.

These project objectives are in direct support of the objectives of the station which are:
1. To provide breeder’s seed in large quantities including vegetables, maize, sorghum, sunflower, wheat and food legumes.
2. To supply certified seed of all the crops and any others in accordance with demands from farmers.
3. To provide good quality improved planting materials for various crops including sweet potatoes, cassava, fruits, mulberry for silk worms, coffee, soil fertility improving species.
4. To develop and adapt improved small holder irrigation technologies.

iii) Outline of the project

**Physical Infrastructure**
The following infrastructure would need to be fully refurbished:
- 129 Nr housing units of various sizes
- 1 Nr workshop
- 3Nr stores
- 2 Nr office blocks
- 1 Nr soil physics laboratory
- 1 Nr plant pathology laboratory
- 1 Nr seed processing shed
- 1 Nr library
- 1 Nr tissue culture laboratory
- 1 Nr cold storage room
- 1 Nr guest-house with catering facilities
- 50 km murram roads
- 10 km canals
Chapter 4  Sectoral Development Strategies

- 3 Nr water reservoirs
- 100 km water piping
- Nr pump houses
- 10 km electrical fencing
- 2 Nr standby electricity generators
- 2 Nr transformers
- Various agro-meteorology station repairs

Vehicles, irrigation installations, field, workshop and office equipment
- 2 Nr 4x4 pickup double cabin vehicles
- 1 Nr light truck
- 1 Nr 7 tonne truck
- 1 Nr 60 hp tractor
- 1 Nr 120 hp tractor
- 6 Nr motor cycles
- 2 Nr 120 l/s pump-sets
- 8 Nr 50 l/s pump-sets
- 1 Nr x 50 ha centre pivot irrigation system
- 100 ha modular sprinkler system
- 5 Nr boreholes with casing and pump
- 1 Nr mould board plough
- 1 Nr x 4 disk plough
- 1 Nr ditcher
- 1 set of instruments for field moisture determination
- 1 complete set of workshop machinery, tools and equipment
- 1 Nr compressor
- 5 Nr laptop computers
- 5 Nr desktop computers
- 1 Nr laser printer – black
- 1 Nr laser printer – colour
- 1 Nr photocopy machine
- 1 Nr scanner
- 2 Nr digital cameras
- 1 Nr v-satellite system
- Complete assortment of laboratory analytical equipment and tools
- All supporting software and installation
iv) Benefits / beneficiaries

The principal benefit of the project will be a fully operational NIRS which will supply planting materials to the entire country, conduct irrigated agricultural research with efficiency and contribute to food production, increased incomes and poverty alleviation. An estimated 10,000 smallholder farmers raising irrigated crops on an estimated 30,000 ha will benefit from the activities of the NIRS.

The primary results of the project are:
1. A fully operational NIRS.
2. Well trained personnel conducting research target at all categories of farmers in Zambia – large scale, emerging and smallholder.
3. An efficient flow of certified planting materials and information from the research station – the latter to be incorporated into extension messages.

The farming community will only be secondary beneficiaries of this project. The secondary benefits of the project are expected to be:
1. A wider range of crops to be grown under irrigated conditions.
2. Better yields, higher production and productivity.
3. Improved nutrition and healthy living.
4. Increased incomes and better livelihoods.
### Table C-4  Power Tariffs of ZESCO

**ZESCO LIMITED**  
**REVISION OF ELECTRICITY TARIFFS**

#### 1. UNMETERED RESIDENTIAL TARIFFS

<table>
<thead>
<tr>
<th>Category</th>
<th>Current Tariffs</th>
<th>Approved Tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1: Consumption up to 2 Amps</td>
<td>Energy Charge/Month K 4,424.00</td>
<td>K 4,911.00</td>
</tr>
<tr>
<td>L2: Consumption between 2 –15 Amps</td>
<td>Energy Charge/Month K 16,009.00</td>
<td>K 17,770.00</td>
</tr>
</tbody>
</table>

#### 2. METERED RESIDENTIAL TARIFFS

<table>
<thead>
<tr>
<th>Category</th>
<th>Current Tariffs</th>
<th>Approved Tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1: Consumption up to 300 kWh</td>
<td>Energy Charge/kWh K 63.00</td>
<td>K 70.00</td>
</tr>
<tr>
<td>R2: Consumption – 301 to 700 kWh</td>
<td>Energy Charge/kWh K 90.00</td>
<td>K 100.00</td>
</tr>
<tr>
<td>R3: Consumption above 700 kWh</td>
<td>Energy Charge/kWh K 147.00</td>
<td>K 163.00</td>
</tr>
<tr>
<td></td>
<td>Fixed Monthly Charge K 5,266.00</td>
<td>K 5,845.00</td>
</tr>
</tbody>
</table>

#### 3. COMMERCIAL TARIFFS

<table>
<thead>
<tr>
<th>Category</th>
<th>Current Tariffs</th>
<th>Approved Tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1: Consumption</td>
<td>Energy Charge/kWh K 147.00</td>
<td>K 163.00</td>
</tr>
<tr>
<td></td>
<td>Fixed Monthly Charge K 26,331.00</td>
<td>K 29,227.00</td>
</tr>
</tbody>
</table>

#### 4. SOCIAL SERVICES TARIFFS

<table>
<thead>
<tr>
<th>Category</th>
<th>Current Tariffs</th>
<th>Approved Tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools, Hospitals, Orphanages, Churches, Water Pumps, Street Lights</td>
<td>Energy Charge/kWh K 122.00</td>
<td>K 135.00</td>
</tr>
<tr>
<td></td>
<td>Fixed Monthly Charge K 21,065.00</td>
<td>K 23,382.00</td>
</tr>
</tbody>
</table>

#### 5. MAXIMUM DEMAND TARIFFS

<table>
<thead>
<tr>
<th>Category</th>
<th>Current Tariffs</th>
<th>Approved Tariffs</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD1: Capacity between 16–300 kVA</td>
<td>MD Charge/kVA/Month K 6,255.00</td>
<td>K 6,943.00</td>
</tr>
<tr>
<td></td>
<td>Energy Charge/kWh K 90.00</td>
<td>K 100.00</td>
</tr>
<tr>
<td></td>
<td>Fixed Monthly Charge K 61,263.00</td>
<td>K 68,002.00</td>
</tr>
<tr>
<td>MD2: Capacity between 301–2000 kVA</td>
<td>MD Charge/kVA/Month K 11,703.00</td>
<td>K 12,990.00</td>
</tr>
<tr>
<td></td>
<td>Energy Charge/kWh K 77.00</td>
<td>K 85.00</td>
</tr>
<tr>
<td></td>
<td>Fixed Monthly Charge K 122,525.00</td>
<td>K 136,003.00</td>
</tr>
<tr>
<td>MD3: Capacity between 2001–7500 kVA</td>
<td>MD Charge/kVA/Month K 17,646.00</td>
<td>K 19,587.00</td>
</tr>
<tr>
<td></td>
<td>Energy Charge/kWh K 57.00</td>
<td>K 63.00</td>
</tr>
<tr>
<td></td>
<td>Fixed Monthly Charge K 245,050.00</td>
<td>K 272,006.00</td>
</tr>
<tr>
<td>MD4: Capacity above 7500 kVA</td>
<td>MD Charge/kVA/Month K 17,744.00</td>
<td>K 19,696.00</td>
</tr>
<tr>
<td></td>
<td>Energy Charge/kWh K 47.00</td>
<td>K 52.00</td>
</tr>
<tr>
<td></td>
<td>Fixed Monthly Charge K 490,101.00</td>
<td>K 544,012.00</td>
</tr>
</tbody>
</table>

**NOTE:**  
The above tariffs do not include:  
(a) 5% Government Excise Duty  
(b) 17.5% Value Added Tax (VAT)

**May 1, 2005**
Figure C-9, which is based on ZESCO presentation materials, shows average tariffs in South African countries. The average for residential, commercial, and industrial consumers was calculated on the use of 900 kWh, 5,000 kWh, and at a load factor of 80% of 2,500 kVA, respectively. The average tariff for residential, commercial, and industrial consumers in Zambia is 3.1, 4.8, and 3.4¢/kWh, respectively, which is rather cheap compared with the rates in other South African countries.

(8) Technical Standards

Since 1997, ZESCO has been working to achieve standardization for stable and reliable power supply and enhancement of services for consumers. Technical standards for transmission/distribution facilities and electricity meters to be provided to consumers are based on the technical standards of the International Electrotechnical Commission (IEC). Service manuals have also been prepared for speedy and efficient consumer service. Everything has been computerized into the Business Information System (BIS), enabling easy access on our computer screens.

(9) Capacity Development

As of March 2005, 3,722 people were employed at ZESCO. In 2004/05, ZESCO sent 66 employees to attend a local training course and 14 to attend courses in foreign countries. In total, 405 employees participated in workshops and seminars.

There are two training centers for ZESCO employees in Zambia: the Kafue Gorge Regional Training Centre (KGRTC) and the ZESCO Training Center (ZTC) in Ndola. KGRTC is open to SADC member countries, and participants can receive training mainly on the operation and maintenance of hydropower stations. The Center has a simulator for hydropower station operations as well as training programs on the SCADA system and GIS.

ZTC, which was established in 1970 for ZESCO employees in Ndola, provides training mainly on the operation and maintenance of transmission and distribution facilities. The buildings and facilities for training have already aged and suffered deterioration, adversely affecting some of the training programs.
ZESCO has developed a detailed plan for rehabilitating and updating the training programs at ZTC as one of the PRP schemes. However, the budget has not yet been arranged because of unexpected excessive costs for rehabilitating existing major hydropower stations in PRP.

(10) Environmental Impact Assessment System

The Environmental Council of Zambia (ECZ) was established under the Ministry of Environment and Natural Resources, which is responsible for conservation of the country’s environment in accordance with the Environmental Protection and Pollution Control Act, Cap 204, 1990. In 1997, the Environmental Impact Assessment Regulation, 1997 (EIA Regulation) was enacted and a system was set up for assessing development projects in Zambia. Moreover, several other laws and regulations were also enacted in relation to national parks, wildlife, cultural heritage, agriculture, forestry, fishery, mines, water resources, etc. The majority of developers of power projects are required by EIA Regulation to carry out an environmental impact assessment. Developers should ask ECZ for approval to proceed with their projects following the sequence below:

a. Before project implementation, developers shall prepare a Project Brief when projects are categorized under the conditions designated in the EIA Regulation. The following are the conditions related to power projects:
   - Hydro power schemes and electrification
   - Resettlement schemes
   - Projects located in or near environmentally sensitive areas

b. After approval of the Project Brief, developers shall carry out a study for environmental impact assessment when projects are categorized under the conditions designated in the EIA Regulation. The terms of reference and experts for the study are subject to the approval of ECZ. Developers shall compile the results of the study into an Environmental Impact Statement and submit it to ECZ for approval.

The following are the conditions related to power projects:

_Dams, Rivers, and Water Resources_
- Dams and weirs covering a total area of 25 ha or more
- Exploration for, and use of, groundwater resources including production of geothermal energy (water to be extracted to be more than 2 million cumecs (m³/s)).
**Electrical Infrastructure**
- Electricity generation station
- Electrical transmission lines – 220 kV and more than 1 km long
- Surface roads for electrical and transmission lines more than 1 km long

According to the above conditions, most power projects will require an environmental impact assessment, excluding short-distance or low-voltage transmission line projects, distribution line projects, renewable energy projects, etc. unless the projects are located within safe areas not specified by the EIA Regulation.

c. During and after project implementation, developers are required to monitor the environment in and around their project area for a specified period.

The EIA Regulation obliges developers to disclose project information to inhabitants through mass media and a public hearing, and to include at least one person in their study team who is a resident in the potentially affected area. Moreover, the EIA Regulation includes a penalty clause whereby a developer who violates the EIA Regulation shall be guilty of an offence and shall be liable, upon conviction, to fine or imprisonment for a period not exceeding three years, or both.
C-2 Current Problems and Issues

(1) Low Electrification Rate

Like many other sub-Sahara countries, Zambia is heavily indebted and in financial difficulty. Zambia is one of the low-level development countries in power generation and transmission facilities, and infrastructure. The principal reason for the low electrification rate, less than 20% compared to the present population, is the country’s poor financial situation, and the following reasons are considered:

As it was made a priority to supply power to copper mines, which is the main industry in Zambia and occupies 90% of acquisition of foreign currency, the development of power facilities has been centralized in the Copperbelt. Power supply to the Copperbelt occupies half of ZESCO’s total generation even now.

Zambia has a land area of 750,000 km² and a population of 11 million. Therefore, the average population density is rather low, i.e. 15 persons/km². Fifty percent of the population lives in urban areas; thus, the population density in rural areas is further below. The phenomenon of underpopulation is one of the reasons for the delay in electrification in rural areas since the advantageous effect against investment is so weak.

On the other hand, even though power supply started in the beginning of 1900, the electrification rate in urban areas is still low. Presumably, with the rapid increase in urban population, distribution expansion could not catch up to supply power to these new consumers because of a lack of transformer capacity. Figure C-10 shows the fluctuation in population density by region. It can be seen in this figure that the population of Lusaka and Copperbelt is soaring. The population density in Lusaka has increased by more than 3% every year since 1990. Therefore, there is an unelectrified area even in the capital, Lusaka, as the distribution network could not be constructed in time.

(2) Aging Power Generation Facilities

As shown in Table C-1, the power generation facilities in Zambia were constructed in the 1960s and 1970s, and there are no power plants constructed after that time. Three hydropower plants and part of substation facilities are under rehabilitation or planned to be upgraded through the ongoing PRP; however, most of the small hydropower plants and transmission/distribution facilities are presumably maintained as is for a long time. In particular, the small hydropower plant that was the independent power source at the time ZESCO was established is very old. Therefore, it is necessary to survey the present condition of the plant and to propose the necessary rehabilitation plan including low-voltage transmission lines.
(3) High Distribution Loss

ZESCO’s transmission and distribution losses in the year 2004/2005 were 2.9% and 18.1%, respectively. As shown in Fig. C-11, the distribution loss seems to be decreasing; however, it is still high.

According to ZESCO, most of the distribution loss is due to non-technical reasons such as illegal power use, alteration of meter devices and excessive use of electricity by flat-rate power users. Supervisors conduct round-the-clock surveillance to monitor illegal power use, and as a result have contributed to reducing illegal use. ZESCO has also introduced a prepaid card system for payment of electricity charges and installed new electricity meter devices that accept prepaid cards to prevent the use of electricity exceeding the charge paid. In the year 2002/2003, the experimental installation of prepaid system devices at 900 households in Lusaka showed good results for preventing illegal power use. Based on this experiment, ZESCO implemented the US$ 2 million project last year to disseminate this new device.

On the other hand, technical loss has its roots in degradation of distribution facilities. Rehabilitation of distribution facilities is expected to be conducted in series starting with the major cities.

Figure C-11  Transmission/distribution loss of ZESCO

Source: Data from ZESCO Annual Report, 2005
Presently, the Zambian Government is preparing a National Development Plan (NDP) in which each sector is represented. We were informed during our survey in February 2006 that a draft of the power sector had already been submitted to the Government and it would be released soon. The draft may have presented the development plan to achieve the target set up in the Zambia Poverty Reduction Strategy Paper (PRSP), 2002-2004, which was developed under the guidance of the World Bank and the International Monetary Fund in May 2002.

According to the PRSP, the development policy and strategy for the power sector are as follows:

(1) National policy for the energy sub-sector
   a) *Electricity*: Increase accessibility in its use as well as the most cost-effective generating sites for domestic and export markets.
   b) *New and Renewable Sources of Energy*: Promote wider application of proven NRSE technologies in meeting energy needs, particularly for remote areas.

(2) Programs in the energy sector
   Programs in the energy sector to contribute to poverty reduction will aim at the following:
   a) Electricity access rate from 20 to 35% by 2010: rural 15% and urban 50%
   b) Increase in electricity exports to neighboring countries by 300% by 2010 from the current level.

(3) PRSP strategies for poverty reduction in the energy sector
   a) Enhancing the capacity of current energy delivery infrastructure through rehabilitation and/or refurbishment to ensure reliable and effective supply, and to ensure access by more people.
      [The Power Rehabilitation Project has been implemented since 1998 in line with this strategy.]
   b) Creating new energy delivery infrastructure through, for example, building new power stations, transmission lines, etc. to cater to increased domestic demand and export.
      [Three hydropower development projects are being planned and financial negotiation is ongoing with private investors from China and Iran. International interconnection projects extending to Tanzania by 300 kV with 700 km length, and to DRC are being planned.]
C-4 Proposed Project

From the results of this study, the following power sector projects are proposed for implementation:

At present, the power output from the three major hydropower plants occupies 98% of the total installed capacity of Zambia, and these plants are now under rehabilitation and repowering works through the Power Rehabilitation Project (PRP).

Completion of the works are scheduled for June 2008. Some transmission and distribution line facilities are being rehabilitated by the same project; however, many other existing transmission and distribution lines still remain unrehabilitated.

Therefore, there is a possibility that even after completion of the PRP, the electricity generated cannot be transmitted and/or distributed. To deliver 100% of the power generated from the three major hydropower plants to the end consumers, it is crucial to implement the following rehabilitation projects, i.e. (1) to (5), and conduct related maintenance training for rehabilitation and reinforcement of the existing transmission and distribution lines.

On the other hand, it is presumed that the expansion of power generation facilities is mainly on hydropower plants; however, it is also important to prepare a development road map considering power trade with neighboring countries through SAPP, with efficient and effective implementation. Although ZESCO developed a power system master plan study in 1993, it should be updated considering Zambia’s change in circumstances since that time. Economic growth has been remarkable and SAPP has become active as they introduced the Short-Term Energy Market in 2001. Moreover, in that study, hydropower potential was reviewed based only on previous studies. For these reasons, the power development master plan as explained in Item (6) below should be prepared as soon as possible so that this master plan would be the development indicator.

(1) Rehabilitation and Reinforcement Works of Distribution Networks in Lusaka and Surrounding Area

The population in Lusaka has increased significantly and urbanization is progressing. However, the distribution facilities are deteriorating and their capacity is not sufficient for expansion of distribution lines presently underway.

Effective electrification in the densely populated urban area will lead to the uplift of cultural level through television and radio, and contribute to improved security in the downtown area, expansion of irrigation through pumping of water to the surrounding agricultural land and development of small- and medium-scale businesses. This project conforms to the National Policy to improve the electrification rate, increase food production and encourage new industry, and the necessity for urgent implementation is considered to be high.

(2) Rehabilitation and Reinforcement Works of Livingstone Distribution Network

Livingstone is located near Victoria Falls, one of the three largest cataracts in the world and an important base for tourism with hotels and lodgings for visitors from the Zambia side. Power distribution to the city
has been supported by two 10 MVA transformer units; however, one of the transformers recently broke down. Therefore, the power supply in Livingstone has become severe with frequent rolling brownouts. The single remaining transformer cannot stop operating to undergo maintenance since there is no spare. Furthermore, most of the 11 kV distribution line is under the ground; thus, maintenance is difficult and damage to the line is severe, resulting in frequent line failure. As reliable power supply is most important for a tourist town, rehabilitation and restoration are urgently required.

(3) Rehabilitation and Reinforcement Works of Power Generation Facilities and Network in Eastern Province

The Eastern Province is a fertile farm belt for irrigation agriculture if stable power supply can be assured. In this respect, it is an important region in view of food security, as propagandized by the Zambian government. However, the power facilities in the Eastern Province were built more than 40 years ago, and blackouts occur quite often. Maintenance costs for the old facilities are soaring and there is also a lack of spare parts. The small Lusiwasi Hydropower Station (12 MW), which is ZESCO's 4th biggest hydropower station and connected to the National Grid, is also quite old as it dates back to 1970. It has no spare parts either, and one of its four units is malfunctioning. To increase food production by supplying stable power for irrigation facilities, it is extremely urgent to rehabilitate and upgrade the power plant and related transmission/distribution network.

(4) Rehabilitation and Reinforcement Works for Copperbelt Distribution Facilities

Ndola and Kitwe, located in the Copperbelt, are the 2nd and 3rd largest cities after Lusaka, respectively. There are many copper mines nearby, which is the basic industry in Zambia; therefore, these cities developed a long time ago with the development of copper mining. The lifespan of the distribution network in both cities has expired; therefore, rehabilitation is required. In addition, with the increase of population and urbanization, the substation capacity is no longer sufficient. Therefore, rehabilitation and expansion of substation facilities are also required. As the 330 kV trunk line supplying power to the copper mines in the Copperbelt passes through both cities, installation of the SCADA system is recommended for the substation. With the introduction of the system, strict monitoring and control from Lusaka would be easier, and would improve the reliability of power supply.

(5) Rehabilitation and Expansion Works for ZESCO Training Center in Ndola

The ZESCO Training Center (ZTC) for ZESCO employees opened in 1970 in Ndola, which is one of the major cities in the Copperbelt. ZTC provides training mainly on maintenance technology for transmission and distribution lines. The training center, which was originally a farmhouse, is very old and has an adverse effect on the training program. As part of PRP, an American consultant prepared detailed plans for repair of the training center, improvement of the training program and renewal of the training facilities. Based on this, ZESCO decided to implement the scheme in 2003; however, a lack of funds has stalled the project. ZESCO is under pressure to disseminate the maintenance and operation technology of the new facilities introduced by PRP.
On the other hand, ZESCO has its own rehabilitation plan for transmission/distribution lines. Therefore, the training of technical staff has become an urgent task. The ZTC training facilities and program are out-of-date now, and renewal of the facilities and program is required in addition to repair of the training center building.

(6) **Power Development Master Plan in Zambia**

To increase the power supply to domestic consumers and the export of power to neighboring countries to acquire foreign currency, the development of generation sources shall be steadily implemented. Zambia has abundant water resources; therefore, the main development target is presumably hydropower. It is recommended that the hydropower potential of the entire country be studied for the efficient and effective development of water resources. Additionally, the power development master plan shall be formulated based on the power demand forecast considering the expansion of the transmission line network in Zambia, rural electrification and SAPP trends.
(NWWSC), AHC-MMS Ltd., Lusaka WSC (LWSC) and Mulonga WSC (MWSC) have been identified as those CUs whose operational costs materially exceed the average tariff. The sharp increase in unit operation costs for NWWSC is attributed to their installation of bulk meters thereby increasing the accuracy of production figures. The low tariff of AHC-MMS is attributed to low declared UfW.

Note, however, that the average tariff in Figure D-2 is calculated by comparing the quantity billed and the amount (ZMK) billed. Therefore the variations do not necessarily reflect the change in the actual tariff during the period. A more realistic picture is portrayed in the comparison of the expected customer water bill to be charged by each CU at a different consumption levels as is shown in Table D-6.

Table D-6  Comparison of Rising Block Tariffs

<table>
<thead>
<tr>
<th></th>
<th>Water Bill of 6 m³ (In K)</th>
<th>Water Bill of 30 m³ (In K)</th>
<th>Water Bill of 60 m³ (In K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHC</td>
<td>6,600</td>
<td>27,650</td>
<td>59,850</td>
</tr>
<tr>
<td>CWSC</td>
<td>10,000</td>
<td>35,200</td>
<td>98,500</td>
</tr>
<tr>
<td>KWSC</td>
<td>6,000</td>
<td>25,200</td>
<td>55,200</td>
</tr>
<tr>
<td>LWSC</td>
<td>6,400</td>
<td>24,400</td>
<td>51,400</td>
</tr>
<tr>
<td>MWSC</td>
<td>4,200</td>
<td>25,800</td>
<td>61,800</td>
</tr>
<tr>
<td>NWSC</td>
<td>7,180</td>
<td>30,580</td>
<td>66,980</td>
</tr>
<tr>
<td>NWWSC</td>
<td>9,000</td>
<td>37,400</td>
<td>83,900</td>
</tr>
<tr>
<td>CHWSC</td>
<td>4,200</td>
<td>35,400</td>
<td>80,400</td>
</tr>
<tr>
<td>SWSC</td>
<td>5,200</td>
<td>26,000</td>
<td>63,000</td>
</tr>
<tr>
<td>WWSC</td>
<td>3,600</td>
<td>22,275</td>
<td>50,775</td>
</tr>
<tr>
<td>Average Bill</td>
<td>6,238</td>
<td>28,991</td>
<td>67,181</td>
</tr>
<tr>
<td>Average Bill (In $)</td>
<td>1.39</td>
<td>6.44</td>
<td>14.93</td>
</tr>
<tr>
<td>Average Tariff (S/m³)</td>
<td>0.23</td>
<td>0.21</td>
<td>0.25</td>
</tr>
</tbody>
</table>

(5) Operational Cost Coverage by Collection

All the CUs are currently operating at a loss, which is shown by the operational cost coverage below 100% in Figure D-3. The operational deficit has in many cases led to CUs not meeting their obligations as they fall due particularly energy bills and statutory payments. This has resulted in service provision being compromised and a threat to the viability of the CUs.

Generally an improvement of 10% has been recorded but there are still 25% of the operational costs not covered in 2004/2005.
(6) Present Situation of Principal WSS Project in Zambia

On-Going projects of the rural areas is reported on the farm of Preliminary Draft, though the urban areas isn’t reported because the Preliminary Draft Report is just started.

The Project whether completed or on-going is missing, but shown the principal WSS project in Table D-7.

Table D-7 List of WSS Project

<table>
<thead>
<tr>
<th>Donor Agency</th>
<th>Programme/ Project Title</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) NORD, GTZ, Ireland Aid, Word Bank</td>
<td>Water Resources Action Programme</td>
<td>***</td>
</tr>
<tr>
<td>2) GTZ/ KfW</td>
<td>Rehabilitation of Urban Water &amp; Sanitation in Southern and North-West Province</td>
<td>***</td>
</tr>
<tr>
<td>3) Word Bank</td>
<td>Mines townships Services Project</td>
<td>***</td>
</tr>
<tr>
<td>4) Ireland Aid</td>
<td>Improvement of Mines townships Services in Northern Province</td>
<td>***</td>
</tr>
<tr>
<td>5) JICA</td>
<td>Groundwater programme in the Southern Province</td>
<td>***</td>
</tr>
<tr>
<td>6) -ditto-</td>
<td>Improvement of the services in a number of centers in the country</td>
<td>***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>On-Going Project</th>
<th>Rural Water Supply and Sanitation (RWSS)</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>7) KfW</td>
<td>Rural Water Supply Project Eastern Province-Phase II</td>
<td>2001-2006</td>
</tr>
<tr>
<td>8) -ditto-</td>
<td>Rural Water Supply Project Eastern Province-Phase III</td>
<td>2007-2009</td>
</tr>
<tr>
<td>9) -ditto-</td>
<td>Rural Water Supply Project North-Western Province</td>
<td>2005-2007</td>
</tr>
<tr>
<td>10) DCI</td>
<td>Northern Province Rural Water Supply and Sanitation Programme</td>
<td>2000-2002</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Project</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(12) JICA Groundwater Development and Sanitation Improvement in Drought-prone Rural Areas</td>
<td>2001-2003</td>
</tr>
<tr>
<td>(13) -ditto- Groundwater Development and Sanitation Improvement in Northern Province</td>
<td>2005-2006</td>
</tr>
<tr>
<td>(14) UNICEF GRZ/ UNICEF WASHE Project</td>
<td>2002-2006</td>
</tr>
<tr>
<td>(15) Danida Preparatory water Sector Programme Support</td>
<td>2004-2005</td>
</tr>
</tbody>
</table>

D - 2 Constraints in Lusaka Capital City

Lusaka, located more or less at the centre of the country, is the capital city and the seat of government and has about 1.5 million residents. The Lusaka Water and Sewerage Company (LWSC) provides potable water and sewerage services to the metropolitan areas of Lusaka.

(1) Water Supply System

i) Present Status of Water Supply System

The average daily water production of approximately 200 million litres is supplied from 2 sources: 50% from surface water of the Kafue River (50 kilometres away) and 50% from boreholes (about 50 wells) in and around Lusaka City area. Consequently there are two main treatment processes being utilised by LWSC.

- Simple on-site chlorination facilities at bore hole sites
- Conventional treatment facilities at the Iolanda Water Treatment Plant, Kafue

There are about 30,000 connections on the main distribution system. There are several large self-standing piped systems serving up to 100,000 consumers. However, about 40% of the city's residents are provided with water through non-regulated systems including vending and resale from connected consumers.

LWSC was established in 1988 about 10 years before the present formation of CUs in Zambia. LWSC leased assets from the Municipality of Lusaka City. In 2002, LWSC was transformed into a CU as assets were transferred into the utility. The Lusaka City Council is the sole shareholder of the company. The company is now charged with the refurbishment and expansion of services in Lusaka as well as smaller municipalities within the Lusaka Province.

ii) Proposed Projects

ii)-1 Rehabilitation of Iolanda Water Treatment Plant

Water taken from the Kafue River is treated at Iolanda Water Treatment Plant (WTP) located near Kafue. The works should be able to perform to its design capacity of 110,000m³ per day hydraulically, (: Water treatment rate). Although current measured volumes indicate its current operation at around 94,000m³ per day (: Water production rate).
Generally the plant is in good condition and is being operated adequately. The plant was built in 1970 and refurbished in 1989 (mainly M&E). Approximately 30 workers run the plant.

[Necessity of Rehabilitation]

Generally, life of civil structure is around 50 years and those of mechanical and electrical facilities are around 15 to 20 years.

Concrete structures of the plant are in good condition with no visible signs of crack or spalling. However, there are wet patches around the structures that imply leakage from tanks or piping work. Civil structures are needed to be investigated for detection of leaking points and the water proofing work to stop leakage.

The mechanical and electrical facilities are operated with frequent repair work due to ending life of them. Furthermore, purchase of the accessories and spare parts, which is necessary for repair, is difficult. Therefore, much of the mechanical and electrical facilities needs rehabilitation. Much of the instrumentation and control equipment is obsolete and not working, and there is little automation in the plant. There is, however, monitoring equipment on the raw water pumps, high lift pumps at Iolanda, and the booster pumps at Chilanga. Operational data of those facilities must be transmitted via radio to a computerised monitoring station at Stuart Park reservoir in Lusaka and Iolanda WTP. This allows early detection of troubles with the pumps, and enables maintenance teams to be dispatched for solution.

**Table D-8 Project Summary -1**

<table>
<thead>
<tr>
<th>Project</th>
<th>Secondly Improvement Project of Lusaka Water Supply System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Outline</td>
<td>Rehabilitation of mechanical and electrical facility in Iolanda WTP and Chilanga booster pump station. Establishment of Computerised radio-communication system</td>
</tr>
<tr>
<td>Treatment Capacity</td>
<td>110,000 m³/day</td>
</tr>
<tr>
<td>Estimated Cost</td>
<td>US$ 20.9 million</td>
</tr>
<tr>
<td>Implementation Period</td>
<td>D/D*-1year + C/S*-1year = 2years</td>
</tr>
</tbody>
</table>

* D/D: Detail Design, C/S: Construction Stage

ii)-2 Master Plan (M/P) Study of Water Supply and Sewerage, and Feasibility Study (F/S) of New Water Treatment Plant

LWSC has approximately 50 boreholes around the city, which draw water from the Lusaka and the Cheta aquifers. These aquifers account for about a half of the water supplied into the LWSC distribution system (about 100,000 m³ per day). A number of private boreholes exists in the city. Abstraction of groundwater is unregulated because there is no registration of private boreholes, and any precise assessment of present status of groundwater source.

The major risks associated with the sustainability of the aquifer relate to pollution from sewage,
solid waste, and any other unregulated discharges in and around the Lusaka area. Pollution from agricultural activities also poses a problem. There are concerns about regulation against overexploitation from existing aquifer in the city, and high risk of contamination by discharges from uncontrolled septic tanks and pit latrines. To cope with the projected demand in the future, there is a need to investigate and develop a new groundwater source in the Lusaka Aquifer. However, further extension of the new water treatment plant near Kafue River is also an alternative to be examined as a cost effective measure.

Presently, LWSC has no long-term strategic plan with regard to provision of water supply and sewerage facilities. There is an urgent need to launch studies to develop a Water Supply and Sewerage Master Plan in order to identify long-term investment plans for both services.

<table>
<thead>
<tr>
<th>Project</th>
<th>Water Supply and Sewerage M/P Study in Lusaka capital city and F/S of Priority Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object of F/S</td>
<td>Priority Project</td>
</tr>
<tr>
<td>Water production rate of F/S</td>
<td>110,000 m$^3$/day</td>
</tr>
<tr>
<td>Estimated Cost</td>
<td>US$ 2.3 million</td>
</tr>
<tr>
<td>Implementation Period</td>
<td>1.5 years</td>
</tr>
</tbody>
</table>

[Necessity of New Water Treatment Plant]

Augmentation of water treatment capacity is usually carried out by expansion of the existing WTP in order to avoid increase of number of facilities to be managed. However, existing Iolanda WTP has a problem with the Kafue water resource, which is located downstream of Industry and Wastewater Treatment Plant in Kafue Town. Accordingly, the intake water of Iolanda WTP is contaminated.

Although Industry activities in Kafue are currently declining, there is a possibility that this trend will reverse with time. Additionally, the location of the Kafue Wastewater Treatment Plant being only 10 km upstream of the water intake is a potential threat to raw water quality. This activated sludge wastewater treatment plant together with the sewer system is under the responsibility of the Kafue local council and is not currently under the control of LWSC. The plant looked not operated. All incoming sewage flow was being redirected to the river via un-maintained maturation ponds. Judging the relatively low flow at the inlet work, it was considered that 4 to 5 sewage pumping stations in Kafue were also not operative and most of sewage is probably overflowing directly to the river.

Consequently, the new water treatment plant is desirable to be constructed at the upstream of the Industries and Wastewater Treatment Plant in Kafue.
**Table D-10 Project Summary –3**

<table>
<thead>
<tr>
<th>Project</th>
<th>Extension of Lusaka Water Supply System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Outline</td>
<td>Establishment of New WTP and Booster pump station with Clearwater Transmission Pipe</td>
</tr>
<tr>
<td>Treatment Capacity</td>
<td>110,000 m³/day</td>
</tr>
<tr>
<td>Estimated Cost</td>
<td>US$ 93.7 million</td>
</tr>
<tr>
<td>Implementation Period</td>
<td>P/I*-1 year + D/D-1 year + C/S-2 years = 4 years</td>
</tr>
</tbody>
</table>

* P/I: Preparation of Implementation, D/D: Detail Design, C/S: Construction Stage
Chapter 4  Sectoral Development Strategies

Iolanda Water Treatment Plant

Token Pleat of Friendship & Cooperation  Water Source in Kafue River

Raw Water Pumping Station  Chlorine Room

Chemical Room  Clear Water Transmission Pipe
(2) Sewerage System

i) Present Situation of Sewerage System

Currently, only 30% of housings in the LWSC water supplied area are connected to the public sewerage system. The sewer network is divided into several catchment areas and there are seven Sewage Pumping Stations (SPS) in the sewer network. The sewer network consists of approx. 450km of mainly Asbestos Cement (AC) pipe ranging in size from 150mm to 825mm. A detailed investigation needs to be carried out to assess the condition of the sewer network. As mentioned for the water supply system, a sewerage master plan is also needed to be prepared so that any future works can be planned fully reflecting the water supply plan of the city and for protection of groundwater resources.

The sewage treatment facilities for Lusaka are two conventional treatment plants and five non-conventional plants in the form of waste stabilisation ponds. The conventional treatment plants comprise screening & grit removal facility, primary sedimentation tanks (PST), biological filters, final sedimentation tanks (FST), maturation ponds, and sludge treatment facilities.

All the treatment facilities serving for Lusaka are hydraulically overloaded with around twice of the maximum design flow. The outlet weirs to the PSTs and the FSTs were submerged. Overloading is obvious at the Manchichi Wastewater Treatment Plant (WWTP) where the storm overflow weir was in continual operation with excess flow directed to maturation ponds. This is causing further problems at the ponds as they were not designed to accept raw sewage.

ii) Proposed Projects

Rehabilitation and expansion of the two conventional treatment plants

Outline of existing two conventional treatment plants are shown in Table D-11 and D-12.

<table>
<thead>
<tr>
<th>Table D-11 Manchichi WWTP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stated Operation</strong></td>
</tr>
<tr>
<td><strong>Design Capacity</strong></td>
</tr>
<tr>
<td><strong>Treatment Process</strong></td>
</tr>
<tr>
<td><strong>Current Condition</strong></td>
</tr>
</tbody>
</table>
| **Current Constrains on Treatment Process** | 1) Serving rate is hydraulically overloaded  
2) Current effluent water quality is BOD-90mg/L, SS-99mg/L though Standard is BOD-50 mg/L, SS-100mg/L. Treatment effect is very wrong. |
Table D-12 Chunga WWTP

<table>
<thead>
<tr>
<th>Stated Operation</th>
<th>1973</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Capacity</td>
<td>9,100 m$^3$/day</td>
</tr>
<tr>
<td>Treatment Process</td>
<td>Biological filter (Trickling filter)</td>
</tr>
<tr>
<td>Current Condition</td>
<td>Receiving rate: 16,000 m$^3$/day</td>
</tr>
<tr>
<td>Current Constrains on Treatment Process</td>
<td>1) Serving rate is hydraulically overloaded &lt;br&gt;2) Current effluent water quality is BOD-250 mg/L, SS-110 mg/L though Standard is BOD-50 mg/L, SS-100 mg/L. Treatment effect is very wrong.</td>
</tr>
</tbody>
</table>

The civil structures were relatively in good condition despite their age and hydraulic overloading, and some structural refurbishment will significantly extend their useful life. Augmentation of treatment capacity, however, is urgently required to cope with the present and projected future increasing flows.

All of the mechanical and electrical facilities need complete overhaul and replacement with new instrumentation and control equipment. Many of the treatment units were not operable due to breakdowns, lack of maintenance or lack of spare parts because of long operation exceeding their life.

There are sludge treatment facilities consisting of dewatering, two anaerobic digestion tanks, one aerobic tank and sludge drying beds. Those are operated for final treatment prior to disposal to land. The anaerobic digestion tanks are currently inoperable due to maintenance problems. Accordingly, sludge still passes through these tanks before entering the aerobic tank. Recovery of function of the digestion tanks through rehabilitation works is required.

Table D-13 Project Summary –4

<table>
<thead>
<tr>
<th>Project</th>
<th>Improvement Project of Manchinchi WWTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Outline</td>
<td>Rehabilitation of mechanical and electrical facility in existing WWTP and five SPSs. Extension of WWTP at Design capacity 36,000 m$^3$/day</td>
</tr>
<tr>
<td>Total Design Capacity</td>
<td>72,000 m$^3$/day</td>
</tr>
<tr>
<td>Estimated Cost</td>
<td>Rehabilitation - US$ 14.8 million + Extension-US$ 29.6 million = US$ 44.4 million</td>
</tr>
<tr>
<td>Implementation Period</td>
<td>B/D*-1year + D/D-1year + C/S-1.5years = 3.5years</td>
</tr>
</tbody>
</table>

* B/D: Basic Design
Table D-14  Project Summary –5

<table>
<thead>
<tr>
<th>Project</th>
<th>Improvement Project of Chunga WWTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Outline</td>
<td>Rehabilitation of mechanical and electrical facility in existing WWTP and one SPS. Extension of WWTP at Design capacity 9,100 m³/day</td>
</tr>
<tr>
<td>Total Design Capacity</td>
<td>18,200 m³/day</td>
</tr>
<tr>
<td>Estimated Cost</td>
<td>Rehabilitation -US$ 3.7 million + Extension-US$ 7.5 million = US$ 11.2 million</td>
</tr>
<tr>
<td>Implementation Period</td>
<td>B/D-1year + D/D-1year + C/S-1.5years = 3.5years</td>
</tr>
</tbody>
</table>
Chapter 4  Sectoral Development Strategies

Manchichi Wastewater Treatment Plant

- Preliminary Treatment Facility (Screening & Vortex type grit removal)
- Primary Sedimentation Tanks
- Biological Filters (Tricking Filters) (Half sets does not work sufficiently)
- Final Sedimentation Tanks
- Biological Filter & Digestion Tanks (Anaerobic tanks are not functioning)
- Sludge Draying Beds
Chunga Wastewater Treatment Plant

Preliminary Treatment Facility
(Screening & Vortex type grit removal)

Primary Sedimentation Tank

Biological Filters (Tricking Filters)
(All filter are not working sufficiently)

Final Sedimentation Tanks

Digestion Tanks
(Anaerobic tanks are not functioning)

Sludge Draying Beds
Chapter 4  Sectoral Development Strategies

Kaunda Square Stabilisation Pond

Stabilisation Pond Signboard

Sewage Resaving Facility
(no maintenance)

Anaerobic & Facultative Pond
(Partition wall is crumbled)
D -3 Constraints in Livingstone City

Livingstone located in the Southern Province is the third biggest city in Zambia with a population of about 114 thousand residents, and is next largest to the Ndola. The city is a tourist resort having the Victoria Falls, which is one of the three big falls in the world, but annual tourist population is approximately 8,000 only. Therefore, current situation is in awaiting the tourism development.

Southern Water and Sewerage Company (SWSC) provides water supply and sewerage services to the urban areas of Livingstone.

(1) Status of Tourism Development

i) Tourism Infrastructure Development

In 2003, a total of US$0.64 million (K2 billion) was allocated for infrastructure development, of which US$290 thousands (K900 million) was disbursed. These funds enabled the government to embark on the rehabilitation of the Livingstone Museum and three other heritage sites in the second half of 2003. Apart from the government resources, Cooperating Partners provided additional resources to complete the rehabilitation of the Livingstone Museum. In addition, rehabilitation works was commenced on access roads in the Kafue National Park, the Lower Zambezi/Siavonga Development project and the Luangwa National Park. These rehabilitation works would be completed by June 2004.

In 2004, a total of US$2.82million (K8.85 billion) was budgeted for infrastructure development in the sector. By June 2004, US$0.670 million (K2.1 billion) had been disbursed. These funds were used to complete project preparation work in Livingstone for the solid waste management system, tourist access roads and the capacity building for the Livingstone City, as well as the building of the South-West Regional Tourism office.

ii) Marketing and Promotion Activities

A total budget of US$1.78million (K5.6billion) was allocated in 2003 for tourism marketing and promotion activities of which US$0.38million (K1.2billion) was released to carry out the following activities:

- Attending three international trade fairs;
- The production of 5000 Generic brochures, 3000 promotional CDs, and 2000 tourist maps;
- Media sensitisation exercise; and
- The re-opening of the Zambia National Tourist Board New York office.

Other activities undertaken during the first half of 2004 included the preparation of reports on the inventory of existing and potential tourism products, the collection of preliminary
data/information from other countries on the Tourism Satellite Accounting (TSA) at a cost of US$0.06million (K200million) and the continued preparation of the National Tourism Development Master Plan.

(2) Water Supply System

i) Present Situation of Water Supply System

The average daily water production of approximately 28,000m³ is supplied from only one water treatment plant (WTP) obtaining raw water from surface water of Zambezi River at downstream of the Kariba dam. The main water supply system employed gravity flow except some hills area. There are about 18,000 connections on the main distribution system, though the metered connections are about 8,000. Accordingly, the covered population is about 80,000 (coverage ratio: 70%)

SWSC was established in 1999 about seven years before the formation of CUs in Zambia.

In 2015, reduction of domestic water demand is anticipated to the 280L/capita/day though current demand is the 350L/capita/day. The reasons for this reduction are as follows:

- The improvement project of the water supply network was carried out in 2003 by cooperation of the German government. Accordingly, the water leakage ratio was reduced;
- SWSC will make effort to increase connection numbers because there is many illegal connections and communal/public taps presently;

ii) Proposed Projects

Rehabilitation of Livingstone Water Treatment Plant

The Livingstone WTP was Established in 1930 as the first phase, the WTP was expanded in 1950 as the second phase, and next expansion was carried out in 1980 as the third phase. The facilities of first phase are not utilised because of long operation period of more than 70 years.

Water taken from Zambezi River is treated at the Livingstone WTP. Hydraulically, the WTP should be able to treat to its design water supply rate of 38,000m³ per day (: Water production rate) except the first phase facilities. However current measured volume indicates only 74% of the design rate or about 28,000m³ per day is the performance of current operation (: Water production rate) due to decrepitude of facilities. In 2015, water supply coverage population is anticipated to be increased to about 150,000, and water supply rate is anticipated to be raised to 38,000m³/day (coverage rate 100%).

Accordingly, the improvement project of the Livingstone WTP is judged as the high priority project for the Livingstone city and SWSC.
Necessity of Rehabilitation

Generally, life of the civil structures is around fifty years and those of mechanical and electrical facilities are from fifteen to twenty years.

Second phase civil structures are in undesirable condition with visible signs of cracks and spalling because of more than fifty years of operation. Therefore, it needs middle scale refurbishment work. Third phase civil structures are also in undesirable condition with visible signs of cracks or spalling though rather better than those of second phase. Therefore, refurbishment and restoration work are required to extend their life.

All of the mechanical and electrical equipment need complete overhaul and replacement with new instrumentation and control equipment. Many of the treatment units were not operable due to breakdowns, lack of maintenance or lack of spare parts because of long operation exceeding their life. There is, however, monitoring equipment in a raw water pumping station, the Livingstone WTP and the hill area service tank. Operational data of those facilities must be transmitted via radio to a computerised monitoring station in the Livingstone WTP. This allows early detection of troubles with the pumps, and enables maintenance teams to be dispatched for solution.

### Table D-15 Outline of WTP

<table>
<thead>
<tr>
<th>Stated Operation</th>
<th>1(^{st}) phase: 1930, 2(^{nd}) phase: 1950, 3(^{rd}) phase: 1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Capacity</td>
<td>Water production rate: 38,000 m(^3)/day (except the 1(^{st}) phase)</td>
</tr>
<tr>
<td>Treatment Process</td>
<td>Rapid sand filter</td>
</tr>
<tr>
<td>Current Condition</td>
<td>Water production rate: 28,000 m(^3)/day (except the 1(^{st}) phase)</td>
</tr>
<tr>
<td>Current Constrains on Treatment Process</td>
<td>Current measured volumes indicate is only 74% toward the design rate</td>
</tr>
</tbody>
</table>

### Table D-16 Project Summary –6

<table>
<thead>
<tr>
<th>Project</th>
<th>Improvement Project of Livingstone WTP</th>
</tr>
</thead>
</table>
| Project Outline | Except the 1\(^{st}\) phase  
1) for 2\(^{nd}\) phase facilities  
   Refurbishment work of middle scale for Civil structures  
   Rehabilitation of mechanical and electrical facility  
2) for 3\(^{rd}\) phase facilities  
   Refurbishment work of low scale for Civil structures  
   Rehabilitation of mechanical and electrical facility  |
| Total Design Capacity | 38,000 m\(^3\)/day |
| Estimated Cost | Rehabilitation -US$ 10 million |
| Implementation Period | B/D*-1year + D/D-1year + C/S-1.5years = 3.5years |

* B/D: Basic Design, D/D: Detail Design, C/S: Construction Stage
Livingstone Water Treatment Plant

Raw Water Intake Facility in Zambezi River

Raw Water Pumping Station

Sedimentation Tank

Chlorine Room & Sand filter Operation Room

Filtration Tank -1

Filtration Tank -2
(3) Sewerage System

i) Present Situation of Sewerage System

Presently, whole area of the SWSC water supplied area is connected to the public sewerage system. In the wastewater treatment plant (WWTP) for Livingstone, there is one non-conventional plant in the form of waste stabilisation pond.

Receiving wastewater rate of the WWTP is not identified accurately due to lack of any monitoring devices. However, the wastewater rate is estimated at about 23,000m$^3$ as the average daily flow being 80% of water supply rate of SWSC.

ii) Proposed Projects

Improvement of Livingstone WWTP

The Livingstone WWTP is the open cut type stabilisation pond with no maintenance activity. Stabilisation ponds are renewed by excavating new ponds and filling the old ponds with soil, when old ponds become unusable due to loosing the treatment capacity by settled sludge. This repeating construction method is for permanent use of premises of the treatment plant. Existing WWTP was re-excavated in 1998. Embankment of the ponds is made of compacted sand without any impermeable lining. Consequently, wastewater exudes from the embankment, which deteriorates the surrounding environment.

Improvement of the WWTP must be performed including provision of impermeable lining work and the treatment method is desirable to be changed to the conventional method (e.g. Oxidation Ditch). In addition, even in either method is adopted, instrumentation equipment and laboratory are necessary to protect environment through monitoring of treatment quality and quantity.

SWSC requested to change the treatment method to the conventional one.

<table>
<thead>
<tr>
<th>Table D-17 Outline of WWTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latest re-excavation</td>
</tr>
<tr>
<td>Design Capacity</td>
</tr>
<tr>
<td>Treatment Process</td>
</tr>
<tr>
<td>Current Constrains on</td>
</tr>
<tr>
<td>Treatment Process</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### Table D-18 Project Summary –7-1

<table>
<thead>
<tr>
<th>Project</th>
<th>Case –1; Improvement Project of Livingstone WWTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Outline</td>
<td>Stabilisation pond make to the concrete structure</td>
</tr>
<tr>
<td>Design Capacity</td>
<td>30,000 m³/day (Water supply rate: 38,000 m³/day x 80 %)</td>
</tr>
<tr>
<td>Estimated Cost</td>
<td>US$ 9.9 million</td>
</tr>
<tr>
<td>Implementation Period</td>
<td>B/D-1year + D/D-1year + C/S-1year = 3years</td>
</tr>
</tbody>
</table>

### Table D-19 Project Summary –7-2

<table>
<thead>
<tr>
<th>Project</th>
<th>Case –2; Improvement Project of Livingstone WWTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Outline</td>
<td>New WWTP system change to the Oxidation Ditch</td>
</tr>
<tr>
<td>Design Capacity</td>
<td>30,000 m³/day (Water supply rate: 38,000 m³/day x 80 %)</td>
</tr>
<tr>
<td>Estimated Cost</td>
<td>US$ 24.7 million</td>
</tr>
<tr>
<td>Implementation Period</td>
<td>B/D-1year + D/D-1year + C/S-1.5years = 3.5years</td>
</tr>
</tbody>
</table>
Livingstone Stabilization Pond

Anaerobic Pond
(Pond is filled up with Sludge)

Facultative Pond
(Pond is covered with Water Hyacinth)
E. Industry and foreign investment

E-1 General

As shown in the import and export statistics from 1999 to 2004, Zambian industry is expanding steadily, reflecting the process of its economic vitalization.

Table E-1 Summary of External Trade Statistics, 1999 – 2004 (K’ Million)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total exports fob) [E]#</td>
<td>2,327,900</td>
<td>2,716,557</td>
<td>3,537,206</td>
<td>4,069,916</td>
<td>4,626,000</td>
<td>3,664,676</td>
</tr>
<tr>
<td>Total imports (cif)[I]</td>
<td>1,673,816</td>
<td>2,751,563</td>
<td>3,900,496</td>
<td>4,725,224</td>
<td>7,423,450</td>
<td>4,730,941</td>
</tr>
<tr>
<td>Trade balance</td>
<td>654,084</td>
<td>(35,006)</td>
<td>(363,290)</td>
<td>(655,307)</td>
<td>(2,797,449)</td>
<td>(1,066,264)</td>
</tr>
</tbody>
</table>

Note: Data for 2004 are up to June; Note: The figures in Parenthesis ( ) have a negative sign; Total Export [E]# = Domestic exports plus re-experts

Table E-1 permits the following analysis:

1. Both exports and imports are increasing year after year, and trade with relevant countries is expanding.
2. However, an adverse trade balance has been continuing since 2000 and was substantial in 2003 and 2004.
3. In particular, imports in 2003 were 4.4 times greater than in 1999, and 1.6 times greater than exports.
4. The trade balance in 1999 was favorable, but it has been unfavorable since 2000, and imports are increasing year after year.

The sudden increase in imports is attributable to immature industries, and is likely to increase further as the national income increases in future.
As shown in Table E-2, the total amount of imports in 2004 rose to approx. $1,600 billion. However, most of the imports are processed goods, industrial products, and durable consumer goods that can be produced in Zambia, 60–70% of which can be produced domestically by import-substitution industries. The optimum method that Zambia should adopt to export its goods to the neighboring countries is to foster industries within a few years in order to gain international competitive power to produce goods that are superior to imports.
As shown in Table E-3, all the exports are primary products and do not include processed goods, representing a typical mode of industry in which primary products are exported while processed goods and industrial products are imported.

In order to analyze the above-mentioned situation, research was conducted in four fields – industrial complex research, market research, company visiting research, and related institution visiting research. Zambia has a heavy-industry zone, light-industry zone, and SME zone here and there in the Lusaka district, which include gigantic upgraded industrial complexes. However, 60% of the industrial complexes are vacant and overgrown with weeds, without any sign of corporate activity. Approximately 20% of the enterprises in the industrial complexes are in operation and the rest are not. The central cause of inactivity is the financial system. The smallness of the market for a population of 10,000,000 is of course one of the causes, and the import of a large quantity of finished products from foreign countries is making the domestic market even smaller. Judging from the situation of imports, the essential domestic market serves about 1,000,000 to 2,000,000 people. In terms of the industrial structure, Zambia exports raw materials such as copper, cobalt, cotton, cement, jewels, and agricultural products (sugar, tobacco, flower, etc.) as the primary resources (Table E-3).

As processed products made of respective raw materials, Zambia imports copper wire, copper pipes, various types of processed food, canned food, steel sheets, reinforcing bars, accessories, wooden furniture, smoothly planed boards, and confectionary, providing value added to the neighboring countries. Imports have increased year after year since 1999, with a conspicuous increase in industrial products and durable consumer goods (Table E-2). These two items account for half of the total imports, and such a trend is likely to grow as the national income increases. The government must plan to foster domestic industries to produce industrial products and durable consumer goods.

Table E-3  Export Products, Extra Zambia Trade for 2004**. (K' Millions)

<table>
<thead>
<tr>
<th>Product</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined copper</td>
<td>995,184</td>
<td>1,386,254</td>
<td>1,747,270</td>
<td>2,004,120</td>
<td>1,866,408</td>
<td>1,049,005</td>
</tr>
<tr>
<td>Cobalt</td>
<td>504,374</td>
<td>518,972</td>
<td>600,586</td>
<td>565,645</td>
<td>631,820</td>
<td>633,294</td>
</tr>
<tr>
<td>Cotton</td>
<td>175,798</td>
<td>104,265</td>
<td>146,253</td>
<td>165,223</td>
<td>221,457</td>
<td>383,095</td>
</tr>
<tr>
<td>Semi-precious stones</td>
<td>39,690</td>
<td>54,078</td>
<td>121,236</td>
<td>199,608</td>
<td>357,131</td>
<td>59,628</td>
</tr>
<tr>
<td>Sugar</td>
<td>57,584</td>
<td>72,350</td>
<td>132,934</td>
<td>138,536</td>
<td>147,398</td>
<td>94,819</td>
</tr>
<tr>
<td>Tobacco</td>
<td>56,109</td>
<td>26,887</td>
<td>41,383</td>
<td>70,098</td>
<td>95,138</td>
<td>121,669</td>
</tr>
<tr>
<td>Cut flowers</td>
<td>5,075</td>
<td>9,475</td>
<td>17,721</td>
<td>14,365</td>
<td>36,275</td>
<td>10,985</td>
</tr>
<tr>
<td>Cement</td>
<td>17,985</td>
<td>31,769</td>
<td>24,066</td>
<td>20,813</td>
<td>28,308</td>
<td>16,913</td>
</tr>
</tbody>
</table>


Note: This table is an extract from Tables (8) to (13) in Appendix 1.? Denotes Revised, While 2004 data runs up to June
In the market, 90% of the goods displayed at shopping center are imports, and Zambian goods are limited to vegetables and fruit. In other words, industries that increase the value added have not been fostered in Zambia even though raw materials are available. According to relevant data, the number of manufacturers joining the ZCSMBA has declined suddenly from 35% recorded ten years ago to 18% at present. However, the number of trading firms has increased rapidly from 20% to 48%, and imports from the neighboring countries have increased.

E-2 Present problem and assignment

The trend of Zambian industry is shifting rapidly from manufacturing to commerce centered on import-export business, and the domestic value added will decrease further, resulting in the loss of international competitive power if this phenomenon remains unchanged. In order to assess the situation, the study team visited eight companies and summarized their requests for governmental support. Common problems cited by the eight companies are summarized in the following outline. (Details are provided in ‘E-5 Visit to companies’.)

(1) Loan system
(2) Tariffs
(3) Induction of foreign capital and benefit policy
(4) Industrial complexes
(5) Value added policy

(1) Loan system

Companies are extremely lacking in working capital and equipment investment capital. Since they must carry out their production activities with poorly maintained facilities, both productivity and quality have deteriorated as a result. Furthermore, there is a relative decrease in international competitive power because the country cannot catch up with the evolution of imports. Because of these two factors, imports are increasing rapidly, and the manufacturing industry, especially SMEs, is in critical condition.

The interest rate differs from company to company; the interest on bank credit for good-standing companies is 10%, while that for SMEs ranges from 25 to 35%. The earnings of the manufacturing industry in general is only 5-10%, and the loan system, which cannot save companies in bankruptcy because of the debt loan, is by no means fostering the industry. Products imported from advanced countries are produced with the loan interest at 5-6%, and the productivity of advanced countries is more than 10 times that of Zambia. Furthermore, the material cost for mass production is 20-30% lower. Under such circumstances, an internationally competitive loan system is indispensable for fostering the manufacturing industry in Zambia. The cotton industry that used to be very important is now gradually
making way for trading firms that import and sell products from China and the neighboring countries. This phenomenon is common to all countries in the world, and the manufacturing industry of the past is shifting to importing and selling business that permits quick collection of capital. If the situation remains unchanged, the foreign currency shortage will accelerate rapidly because of an adverse balance of payments, and the interest rate on loans is likely to increase further.

(2) **Tariffs**

The industrial structure, in which primary products are exported to provide value added to the neighboring countries and processed goods are imported, faces a problem. Dressmakers used to produce uniforms for hospitals, schools, and the police until five years ago. However, for the past three years, importers with Chinese capital have been enjoying the benefit of foreign investment, importing products from China and selling them in Zambia without any import tariff or business tax for five years. There used to be ten dressmakers in and around the area visited by the study team, but only two are still in business now. The workload of one of the dressmakers dropped to 20%, and the business is narrowly surviving by importing and selling Chinese drugs. The dressmaking industry in particular had been very prosperous as a key business in the manufacturing industry until ten years ago. However, as the import duties on cotton and other materials increased, while the import duties on finished products decreased, the effort to import materials and sew them to make finished products does not pay. The dressmakers want to import new machines, but the import tariff is high. Reexamination of the tariff is strongly desired so that machines, equipment, and materials can be imported without any tariff. In general, the manufacturing business poses more risks than the import business, because the collection of capital after investment in plant and equipment, employment of workers, production, and sales takes a long time. The cycle of import, sales, and capital recovery in the import business is 1/3 that of the manufacturing business, and the risk can be avoided. The manufacturing business is handicapped although the interest rate is the same, which constitutes a factor in the shift from manufacturing to trading.

(3) **Induction of foreign capital and benefit policy**

Southeast Asian countries also started import-substitution industries in the past. However, after the appreciation of the yen and the steep rise in personnel expenses from 1985, Japanese-owned companies shifted their production sites to Southeast Asia where the production cost was low. Care must be taken when introducing export industry type foreign capital as a tool for industrial promotion of African countries. There is no market to which export is possible without competition with Southeast Asia. Thailand and Malaysia were successful because over the years they created a market in Japan, U.S., Europe, and the Middle and Near East. The market was not created simply by shifting the production division to reduce the production cost. Zambia does not seem to have an environment suitable for
production of goods for the U.S. or Europe. Therefore, they can find merits in domestic production when market creation is planned in the neighboring countries and in Zambia itself.

The high-tech industry needs high-tech parts; in other words, all parts must be imported. When a tax benefit is given to export companies, the only merit remaining in Zambia is promotion of employment, and important industries (parts industry, SMEs, technical know-how, etc.) will not be introduced. It is an urgent task to establish a new tariff system to eliminate the benefit for foreign-invested companies and foster domestic industries. There is at least a strong desire for establishment of a system that ensures competition on equal footing.

(4) Industrial complexes

The high-tech industry, including manufacture of IC wafers, is a very specialized industry that needs improvement of industrial infrastructure for high-quality electricity, water, vibration proofing, and air conditioning. General factories basically need facilities for power supply, water, and telephone lines. If measures against floods, the problem that Southeast Asia faces in the rainy season, are taken, there is no need for special industrial infrastructure. The present industrial complexes are sufficient, but how to use the excessive industrial complexes in future present a big problem. (The operating ratio of industrial complexes is approx. 20%.)

In particular, if companies are concentrated in a high-tech industrial complex, employment will be promoted only in a limited area in future, causing a battle among companies for acquisition of human resources and deteriorating the stability of the work force. Competition among companies for better human resources will grow, causing a job-hopping phenomenon. Companies should be scattered in the respective areas to ensure increased stability of the work force and upgraded technical level of technicians. Industry is declining in present-day Zambia, and industrial complexes are hollowing out. The first task before Zambia will be the effort to increase the number of companies by fostering industries.

(5) Value added policy

With respect to cotton products, there are opinions that the tariff on finished products is lower than the tariff on the material. Investigation is necessary. According to some companies, foreign-capital-affiliated companies have been importing and selling finished clothes without tax for the last five years. Local companies that must pay tax on materials cannot compete with imported finished products. The edible oil industry used to be in full operation with 1,000 employees, but it cannot compete against inexpensive oil imported from the neighboring countries. There are great expectations for support and fosterage of the local industry that is diminishing with only 300 employees at present. Zambia has
sufficient primary products such as copper, food, livestock, farm products, and wood, which are enough to fill the domestic demand. It is important to foster industries that can increase the value added as much as possible in Zambia, instead of exporting the primary products directly to the neighboring countries. The tariff system should be reviewed and consideration given to abolishing the tariff on materials and changing the tariff on imported goods so that the domestic value added will increase. Research seems necessary to see if the tariff on finished products is higher than the import tariff on raw materials and parts.

**E-3 Strategy for industrial development**

The two policies shown below are proposed as the strategy for the development of Zambian industry.

1. Fosterage of import-substitution industries
2. Fosterage of SME

**Background and reason**

The population is 10,000,000 and the market demand is small; therefore, companies in Zambia find themselves in serious straits. As shown in Table E4, exports exceeded imports in 1999. However, imports have increased rapidly since 2000. According to the results of analysis, copper, cobalt, etc. are exported as mineral resources without processing, and most of the imports can be produced in Zambia. In the first stage of industrialization, it is necessary to enhance the competitive power domestically and foster import-substitution industries. Domestic products should have stronger international competitive power than imported goods and they should be exported to the neighboring countries in the second stage. The GDP of the neighboring countries is similar to that of Zambia, but their total is quite large (Table E-5). Industrialization ahead of other countries will make it possible to export to the neighboring countries.
The market for Zambia is not in the U.S., Europe, or Asia; 51% (2000) of the market is in African countries (inclusive of South Africa), increasing to 80% in 2004, which is very characteristic. In the past four years, economic relations grew more with African countries than with the EU, U.S., or Asia, which suggests that fosterage of domestic industry toward establishment of an export system is very likely to increase the possibility of exporting to the neighboring countries. The shortcut to fosterage of industry for Zambia lies in import-substitution industries for the time being so as to strengthen international competitive power. Table E-6 shows the export market of Zambia.
Table E-6  Market For Zambian NTEs

<table>
<thead>
<tr>
<th></th>
<th>COMESA</th>
<th>South Africa</th>
<th>EU</th>
<th>ASIA</th>
<th>USA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>1053</td>
<td>576</td>
<td>250</td>
<td>62</td>
<td>7</td>
<td>2017</td>
</tr>
<tr>
<td>2000</td>
<td>259</td>
<td>148</td>
<td>204</td>
<td>44</td>
<td>20</td>
<td>775</td>
</tr>
</tbody>
</table>

Selection of import-substitution industries

(a) Goods sought in Zambia
(b) Goods with low tariff on materials and expensive finished products
(c) Goods for which the raw materials can be procured domestically
(d) Goods with large outer frames

The study team visited eight companies in order to examine the possibility of import-substitution industries, successfully investigating four companies that run businesses to meet the domestic demand only. The common features of these companies is that they do not specialize in any specific field and they select goods that can substitute for imported goods, unlike the Japanese companies that specialize in automobiles, home electric appliances, food processing, etc., respectively. They have found goods that meet the above-mentioned four conditions and developed respective products, earning sufficient profit from domestic sales.

The products produced by the four companies (Companies 6, 7, 8, and 9) that the study team visited certainly meet the four conditions. There is no technical relation at all among the products. They produce plastic pipes, feed water tanks, biscuits, bedding (beds and pillows), and furniture, which are rather low-tech commodities, having stronger price competitiveness than Chinese products. They are planning marketing to rival imports in order to increase their market share. Furthermore, they are planning to produce white home electric appliances (washing machines, air conditioners, refrigerators, etc.) within a couple of years using the molding technique. What is commonly found among these companies is that the top management is aware of the importance of import-substitution industries. They have long-term business plans to establish a system to strengthen the competitive power in Zambia and then export to the neighboring countries, indicating the future direction to fosterage of the Zambian manufacturing industry. In other words, it has been verified that there are goods and management methods that permit operation in the domestic market of 10,000,000. One company is planning to import compressors to make air conditioners, intending to export them to the neighboring countries after consolidating the domestic system. If they are successful in producing white home electric appliances, export to the neighboring eight countries is quite possible, being able to foster a powerful export industry that will find a market in the neighboring countries.
Table E-7 shows a comparison of the GDP growth rate in 1999 and 2003 between Southeast Asia and African countries, which clearly shows a difference. The ratio of the manufacturing industry in GDP in 2003 was 20–35% in all the countries in Southeast Asia, while that in Africa was only 5–18%. As a result, the GDP increased by 15–35% in Southeast Asia compared with that in 1990, whereas in African countries, it increased only by 5-24% compared with that in 1990. In other words, it is important to understand that the manufacturing industry is attributable to the increase in the GDP of Southeast Asia.

Table E-7  GDP (5) of manufacturing industry in GDP and growth rate of GDP

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Angola</td>
<td></td>
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<tr>
<td>Malawi</td>
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<td>Namibia</td>
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<tr>
<td>Tanzania</td>
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<tr>
<td>Zambia</td>
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<tr>
<td>Thailand</td>
<td></td>
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<tr>
<td>Indonesia</td>
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<td></td>
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<tr>
<td>Cambodia</td>
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</tr>
</tbody>
</table>

Note: The percentage of GDP 2003/1990 is 1/10 scale.

E-4 Specific measures for industrial development

The large-scale export-type investment made in Southeast Asia is not suitable for Zambia. The industrial environment is different from that in the 1990s. The world’s production and supply system is far greater than the demand, and development competition continues within the limited market. The U.S., Europe, and Asian countries that include Japan and China are making efforts to cultivate an international market, while protecting their own market. Fortunately, the African market is small in scale and products that meet the needs of Africa have not been developed. If only indigenous firms were to produce products
based on market research, they could compete with the imports. Even Chinese products cannot compete with domestic products in terms of transportation costs to faraway Zambia. There is an environment in which domestic products would be advantageous if import-substitution industries develop in Zambia. Therefore, it would be an efficient means of industrial promotion to plan export to the neighboring eight countries after fosterage of import-substitution industries and consolidation of the domestic system.

The direction of support for the specific promotion of development policies is proposed below.

(1) Loan system

In the manufacturing industry, in consideration of the period from the placement of orders for materials until the collection of funds for finished products, as well as of the profitability, an international-level financial policy is necessary. Specifically, an interest rate of 10% or less and a loan system for reimbursement in 4–5 years are desired.

(2) Tariff

A tariff system that will increase the value added is desired.

In other words, the tariff on raw materials, parts, production facilities, development equipment, and other resources necessary for production activities should be set at 0%, and the tariff on imports that are similar to finished products already produced in Zambia should be set at 30% in order to protect and foster domestic industry. The tariff on finished products that have not been produced in Zambia should be set at 0–1% until an application for domestic production is filed, and it should be raised to 25–30% after an application for production has been filed so as to operate the tariff system in accordance with the actual situation of the industry. It is desired to establish such a flexible tariff system that will promote fosterage of domestic industry. (Thailand has been successful in general, suggesting that it is desirable to protect domestic industries in developing countries or in countries where industry has not grown, by adopting a tentative tariff system or adjusting the business tax.) However, such systems should not be permanent, and should continue only until the import and export are well balanced or for about five years until the domestic industry gains international competitive power. What seems most desirable is to adjust the tariff rate according to the difference in GDP between two countries, which would be very effective in fostering industry and promoting international competition on equal footing.

(3) Induction of foreign capital and benefit policy

Care should be exercised when promoting Zambian industry by introduction of foreign capital, because the environment has changed from that of 15 years ago when Southeast Asia introduced foreign capital. Investment in Southeast Asia was made by export-oriented enterprises that were trying to enter the
market there, and the scale was so large that 50% of the domestic manufacturing division was transferred. At that time, the yen was strong, the export market was expanding, the labor force was insufficient, working hours were shortened, and wages were high in Japan; therefore, respective industries, especially the production division, made inroads into the Southeast Asian market. However, many enterprises transferred only the manufacturing division, not the entire corporate activities. Marketing, product development, strategies, price setting, volume of production, and sales areas were all controlled in Japan. Until 1985, 200,000 color TVs were sold annually in respective countries in Southeast Asia (Thailand and Malaysia, for example). The indigenous companies that procured local parts coexisted with Japanese-affiliated electric-appliance makers, attaining co-prosperity. However, from 1986 to 1995, export-oriented enterprises (manufacturing plants) started overseas operations and immediately began production of 4,000,000 TVs annually. As a result, the indigenous companies failed to supply parts in conformity with the demanded volume and quality, cementing the relationship between Japanese-affiliated assembly companies and Japanese-affiliated parts companies. The indigenous companies are trying to become independent by shifting buyers from Japanese-affiliated companies, who take time to approve the quality, to U.S. and European companies.

Large-scale export-oriented companies must cultivate a market to start overseas operations. On the assumption that products should, in principle, be made in areas near a market, Zambia should plan its industrialization by fostering export-substitution industries over a long period. The infrastructures in and around Zambia do not appear to be sufficiently upgraded, and even Chinese products have considerably high transportation cost; therefore, locally produced products would be highly competitive.

(4) Industrial complexes

Lusaka has improved industrial complexes consisting of the heavy-industry zone, light-industry zone, and SME industry zone. However, only 20% of these zones are in operation, while the remaining 80% is abandoned land due to business bankruptcies. As shown in the photos, roads are maintained and improved, and factories are provided with side ditches. These industrial complexes have no specific problem.

Unfortunately, however, the vast land has not been used for production plants. As the ZCSMBA data shows, 20% of the companies were trading firms and 35% were manufacturing firms. Presently, however, 48% are trading firms and 18% are manufacturing firms, clearly showing that the manufacturing industry is declining. In general, manufacturing power is reinforced first and then trading firms grow for export business, but the industrial structure of Zambia is rapidly changing toward a commercial importing country. Zambia is not so rich in resources as to export raw materials and import processed goods, and in consideration of the country’s future, the effort should be changed to
industrialization. It is desirable to foster a processing industry to allow the sufficient number of industrial complexes to begin full-scale operations as well.

(5) Value added

The study team visited nine companies this time. One company analyzed the present tariff system to find raw materials on which the tariff is almost 0% and finished products on which the import tariff is high, concentrating their efforts on molding. The company imports plastic chips from South Africa, forming and processing water pipes and water tanks (from 1,200-ton tanks for industrial use to 10-liter tanks for household use) that are in high demand in Zambia and selling all the finished products in Zambia. Since they are bulky, there is no problem with price competitiveness even if finished products are imported from abroad. The company has invested in a 1,200-ton molding machine, producing furniture (tables and chairs) as well. There is a possibility of fostering manufacturers of white home electric appliances with high value added by making use of the injection technology, which will be an important practical theme depending on the situation and the results of investigation into the metal processing SMEs in the Copperbelt region.

E-5 Proposed project

The current study was limited to companies in the Lusaka district, but Zambia’s industrial power was greater than expected. The country might be able to compete favorably with South African and Chinese products, and immediate feasibility study is required. It is an urgent task to investigate companies especially in Copperbelt, Livingston, and the southern part of Lusaka and understand the actual situation of the processing technology held by small and medium Zambian enterprises. As one type of project, we propose the “Study on Master Plan or Promotion of Small and Medium Industry.” The following items need preliminary study:

(a) Feasibility study on loan program for small and medium enterprises
(b) Detailed examination and analysis of present tariff; the optimum tariff system for fosterage of domestic industry
(c) Study on materials that can be procured locally, and related industry
(d) Study on industry in Lusaka as a whole, and on the industry in Copperbelt
(e) Study on the present situation of processing industry (metal, molding, print assembly)

It is necessary to understand the industry of Zambia as a whole and select industries that are likely to be fostered successfully, as well as to propose a plan for governmental support and develop a program according to the results of the above study.
E-6 Record of visits to companies
(Refer to the record of visits to companies 1-10.)

The private companies’ requests to the government are shown below in the order of precedence.

1) Loans
   Annual interest to be 10% or less, and the reimbursement period to be 3–5 years
   Guarantee system of government agency

2) Tariffs
   Import tariff on materials to be 0%, and the tariff on finished products to be 25–30%

3) Technical support
   Guidance in factory (productivity, quality control, maintenance, etc.), not in the form of vocational training

4) Support for acquisition of know-how in new market exploration (marketing and differentiation of products)
   Small and tiny companies are seeking guidance so that they can gain know-how in marketing.
   They especially want to know the details of package design, differentiation of products, catalogs, etc.

5) Benefit to foreign-affiliated companies
   A policy to foster domestic companies is important, and providing benefits to foreign-affiliated companies is unfair. It is especially difficult to understand why a benefit is unavailable unless a company moves into the industrial complex. Domestic companies want to use the expenditures necessary for moving the present factory for investment in equipment and materials in order to strengthen their international competitive power. Domestic companies are opposed to the policy of spending the tax collected from domestic companies for foreign-affiliated companies, because such a policy will weaken the competitive power of domestic companies. Domestic companies want impartiality.

6) Import-substitution company (domestic demand only)
   The top management of companies thinks seriously about how to find business. Successful indigenous companies in Lusaka are introduced below. The products made by the companies that the study team visited certainly meet the three conditions, and the respective products are not technically related. The companies started producing plastic pipes, water tanks, biscuits, and bedding (beds and pillows), which are rather low-tech commodities, having stronger price competitiveness than Chinese products. The top management of Companies 6, 7, 8, and 9 that the study team visited are aware of the importance of import-substitution industries. They have long-
term business plans to establish a system to strengthen the competitive power in Zambia and then export their products, indicating the future direction to fosterage of the Zambian manufacturing industry.

E-7 Visit to related institutions

(1) Ministry of Commerce
   JICA
(2) TEVETA
(3) ZAM
(4) ZCSMBA
(5) ZPA
   ZEPA

Visit to related institutions – 1 February 13, 2006

Ministry of Commerce
Participants: Permanent Secretary Ministry of Commerce
        Director of Planning Fredson Yamba
        Domestic Trade Abraham Chiwana
        Foreign Trade Department Christopher Chileshe
        Planning & Investment Mukela Munalula

Contents
There are plenty of domestic resources, including copper, cotton, livestock, vegetables, and fruit. However, these raw materials are exported, while processed goods are imported. The value added is not remaining in Zambia. Copper produced in Zambia is processed and imported as copper pipes and electric cables, and meat and fruit are also exported and then imported as canned food. Wood is exported and furniture made from this wood is imported. The practice of importing finished products made of exported materials has taken root, and there seems to be no effort or intention to get the value added within the country. The respective participants are aware of the situation, but advocates with strong leadership and promotion of changes in consciousness are required because industrial development is a project that involves various fields of industry.
Visit to related institutions – 2
February 13, 2006

JICA  Director Inui and Expert Yamai

The coming five years is an important period for fosterage of industry. Unless the economy grows within the next five years, the economic power of the neighboring countries will grow stronger, and revival of Zambia will become difficult. The respective government offices have carefully analyzed the matters in question, but the effort has not resulted in the reformation of the system to foster industry.

Visit to related institutions – 3
February 15, 2006 10:30-11:30

JICA  Advisor Tajima Noriaki

TEVETA (Technical Education, Vocational and Entrepreneurship Training Authority)

JICA  Advisor Tajima Noriaki

Director Development Division  David C. Chakonta

General
1. Provision of education and training
2. Run by the President and 37 other people
3. 93% of the budget is covered by aid from foreign countries: ¥1,300,000,000 in total
   Run by financial assistance, 28% of which is from the World Bank, 24% from the Netherlands, and
   41% from the Danish International Development Agency
4. Vocational training schools have been established in 9 provinces, and 319 schools in total are in operation.
5. Roles of respective organizations
   Financial Division: General affairs, subsidy management, and purchasing
   Standard Division: Examination and approval of vocational training schools and qualification
   Development Division: Improvement of the capacity of training schools, collaboration with
      related fields, and PR activities for TEVETA
6. Policy objectives
   a. Productivity improvement of Zambian labor force
   b. Capacity building, creative ability, company founding spirit, and productivity
   c. Development of economic potential of females
   d. Escape from poverty and improvement of housing, medical care, and sanitation
7. Type of training schools
   National
   Private
   Community-run
Visit to related institutions - 4

ZAM (Zambia Association of Manufacturers) February 16, 2006 10:00-11:45

Chairman of ZAM Diego Casilli
Managing Director of Amanita Group of Company Diego Casilli

Amanita Group of Companies
Mumbwa Rd. P.O. Box 31412 Lisaka 10101
Managing Director Diego Casille

Edible oil manufacturer

General
Establishment in 1991 / Technical guidance from Denmark

1. Large company with 1,000 employees before participation in WTO.
2. Receiving a loan with interest of 24%, but business expansion is impossible.
3. As a result, goods from South Africa are comparatively inexpensive, and the business is diminishing year by year.
4. 1,000 employees were working 10 years ago, and only 300 employees are working now.
5. Sales in the last year totaled $9,000,000.
6. Imports beans from Malaysia; 50% of the finished oil is put on the domestic market, while the remaining 50% is exported.

Request for the government
The following is requested for the fosterage of Zambian industry:

A. Annual interest rate of 10% or less with 5-year reimbursement plan
B. Abolishment of the tariff on materials and increase of the tariff on imports to 25% (tentative adoption permissible)
C. Benefit and support for promotion of export by indigenous companies
D. Abolition of benefit for invited foreign-affiliated companies (Foreign-affiliated companies are receiving loans with a low interest rate. Furthermore, the benefit in terms of business tax, etc. will prevent indigenous companies from competing on equal footing, decreasing the motivation for doing business.)
Visit to related institutions - 5

ZCSMBA
The Zambia Chamber of Small & Medium Business Association
Executive Secretary Mr. Maxwell. D. Sichula

General
1. The number of participating companies reached 10,500.
2. Offices are established at 26 locations in Zambia.
3. Breakdown of participating companies
   Trading firm 48% 10 years ago 20%
   Agriculture 13%
   Manufacturing 18% 10 years ago 35%
   Service 11%
   Food processing 4%
   Tourism (Incl. handicraft) 2%
   Agriculture-related business 4%
   Construction 1%

Requests
1. Skills training
2. Financing
3. Tariff (No tax on finished goods = Foreign-affiliated companies)
   Asking ZCSMBA to make an appointment to visit SMEs in the manufacturing sector
   February 14 1. Artistic flower maker
   2. Manufacturers concerned with sewing, apparel, and design
   3. Manufacturers of music boxes and pool tables

Visit to related institutions - 6

February 15, 2006

ZPA (Zambia Privatisation Agency)
Chief Executive officer Andrew Chipwende

General
1. 261 organizations were privatized, and 100 companies went bankrupt and disappeared.
2. Two companies are in process now.
3. 21 companies are in preparation. (Oil, cement, and food processing)
4. 248 companies in total are being promoted.
5. The companies that went bankruptcy after privatization could not continue production in terms of financing, quality, and productivity.

February 15, 2006

Zambia Export Processing Authority (Multifacility Economic Zone)
Managing Director Fabiano Lukashi
Manager Compliance and Monitoring Isam M Mazuba
Manager Marketing and Public Relations Ms. Margaret Chimanse

General
1. Providing benefits for registered companies to promote industrial development
   Corporate tax to be reduced from 35% to 17%.
   Corporate tax for export-oriented companies to be 15%.
   Reimbursement period to be 5 years.
2. Zambian industries should be assorted and benefits should be given to 18 sectors, whether they are indigenous or foreign-affiliated companies, to promote industrial development.
3. Existing companies can receive the benefits when their application is approved.
## Chapter 5  Project Profiles

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>2. Project site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>Lusaka city and peril-urban settlements</td>
</tr>
</tbody>
</table>

### 3. Implementing agency
Lusaka city council, Ministry of Local Government and Housing

### 4. Justification and objectives
Justification of the study
- The social loss caused by air pollution, traffic accidents, etc. will grow as car traffic increases in the near future
- There are many road projects, which have to be implemented for the majority of citizens.
- There is no traffic master plan.

The objectives of this study are as follows:
- To implement a road traffic master plan in the Lusaka urban area
- To prioritize effective projects
- To conduct feasibility studies for high-priority projects with financing measures

### 5. Project outline
The traffic is increasing in Lusaka City, and there is a concern that congestion, air pollution and traffic accidents will also increase in the near future. Moreover, road construction in the residential area around Lusaka City for low-income people is slow. Therefore, a study on a traffic master plan for the Lusaka urban area should be implemented; a maintenance priority level should be emphasized for each project, and feasibility studies for high-priority projects and proposals for finance measures should be implemented in the priority projects.

### 6. Implementation period
2 years

### 7. Estimated benefit and beneficiaries
- A limited budget can be used for an efficient project.
- Public transport for the citizens of Lusaka will be improved and traffic accidents as well as air pollution will decrease.
- The economy of Lusaka will grow.

### 8. Estimated environmental impacts
Minimum

### 9. Estimated cost
Approx. US$ 2 million
| 1. Sector | Transport |
| 2. Project site | Throughout the country |

3. Implementing agency  
Road Development Agency, Ministry of Works and Supply, Ministry of Communications and Transport

4. Justification and objectives  
Justification of the study  
- The development and improvement of transport infrastructure such as roads, railways and harbors are not progressing much, even though traffic volume is increasing.  
- There are many road projects, which have to be implemented for the majority of citizens.  
- There is no traffic master plan.  

The objectives of this study are as follows:  
- To implement a transport master plan in Zambia  
- To prioritize effective projects  
- To conduct feasibility studies for high-priority projects with financing measures

5. Project outline  
The development and improvement of transport infrastructure such as roads, railways and harbors are not progressing much, thus hampering development of the country, expansion of production and promotion of trade.  

It is important to reduce transport costs to make inland Zambia price competitive in international markets.  

Therefore, a national transport master plan study should be implemented in order to establish the mid/long-term transport policy and transport infrastructure development/improvement policy while putting emphasis on strengthening regional development and corridors to support export promotion.

6. Implementation period  
3 years

7. Estimated benefit and beneficiaries  
- A limited budget can be used for an efficient project.  
- The transport systems will be improved.  
- The economy of Zambia will grow, and people’s livelihoods will improve.

8. Estimated environmental impacts  
Minimum

9. Estimated cost  
Approx. US$ 3 million
### Feasibility Study for Pilot Agricultural Commercialization Project

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>Agriculture</th>
</tr>
</thead>
</table>

| 2. Project site | Mazabuka District, Southern Province |

| 3. Implementing agency | Ministry of Agriculture and Cooperatives |

<table>
<thead>
<tr>
<th>4. Objectives and justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) To formulate a plan of irrigation in the study area</td>
</tr>
<tr>
<td>ii) To conduct a feasibility study on Pilot Agricultural Commercialization Project</td>
</tr>
<tr>
<td>iii) To transfer technology to counterpart personnel in the course of the Study</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Project outline</th>
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<tbody>
<tr>
<td>This project takes the idea to bring water from Kafure river to the Nega-Nega basin and conduct irrigated farming focusing on commercialized agriculture. The project area, gross of 27,000 ha, comprises a mixture of traditional farmers, medium scale farmers, small-scale farmers and large-scale farmers.</td>
</tr>
</tbody>
</table>

| 6. Implementation period | One and half years |

<table>
<thead>
<tr>
<th>7. Estimated benefit and beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct beneficiaries: 3,000 families in study area</td>
</tr>
<tr>
<td>Indirect beneficiaries: 30,000 farmers in the area of same projects in character</td>
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</tbody>
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<table>
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<tr>
<th>8. Estimated environmental impacts</th>
<th>9. Estimated cost</th>
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<tbody>
<tr>
<td></td>
<td>Approx. US$ 1.5 million</td>
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### Refurbishment of the National Irrigation Research Station, Nanga

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>2. Project site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>National Irrigation Research Station in Nanga, Mazabuka district of Southern region</td>
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<table>
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<tr>
<th>3. Implementing agency</th>
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<tbody>
<tr>
<td>Ministry of Agriculture and Cooperatives</td>
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</table>

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<th>4. Objectives and justification</th>
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<tbody>
<tr>
<td>The overall objective of this proposed project is to refurbish the National Irrigation Research Station at Nanga thereby improving the capacity of the center to carry out research activities more effectively.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Project outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To procure and install new irrigation water pumping plant and to service and repair any existing serviceable water pumping plant.</td>
</tr>
<tr>
<td>2. To repair, renovate and construct new buildings as necessary for library, laboratories, stores, workshops, offices and living quarters.</td>
</tr>
<tr>
<td>3. To procure necessary farm machinery and equipment including <em>inter alia</em> tractors, ploughs, harrows and hand implements.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Implementation period</th>
</tr>
</thead>
<tbody>
<tr>
<td>One and half years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Estimated benefit and beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>The principal benefit of the project will be a fully operational NIRS, which will supply planting materials to the entire country, conduct irrigated agricultural research with efficiency and contribute to food production, increased incomes and poverty alleviation. An estimated 10,000 smallholder farmers raising irrigated crops on an estimated 30,000 ha will benefit from the activities of the NIRS.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Estimated environmental impacts</th>
<th>9. Estimated cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approx. US$ 5.0 million</td>
</tr>
</tbody>
</table>
### Project C-1: Rehabilitation and Reinforcement Works of Distribution Networks in Lusaka and Surrounding Area

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>2. Project Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Lusaka Province</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Implementing Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZESCO (Zambia Electricity Supply Company)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Objectives and Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>There has been a considerable rise in demand and load growth in the areas around the capital city of Lusaka necessitating urgent reinforcement and upgrade of the distribution network including the supporting backbone sub-transmission system known as the ‘Lusaka 132 kV Ring’. The problem is also compounded by the ever-increasing population and subsequent demand for power. Effective electrification in the densely populated urban area will lead to the uplift of cultural level through television and radio, and will contribute to improved security in the downtown area, as well as the development of small- and medium-scale businesses. Moreover, in light of the Zambian Government’s ongoing drive to promote agricultural self-sufficiency in the surrounding region where new farming areas have opened for both small- and medium-scale farms, Lusaka can play a strategic role in the agricultural sector in increased food production once stable and reliable power supply is secured.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Project Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Lusaka 132 kV Ring upgrade by reconductoring approx. 90 km of existing line to 200 mm²</td>
</tr>
<tr>
<td>2) Upgrade of Coventry Street Substation (S/S) to new 2 × 40 MVA 132/11 kV</td>
</tr>
<tr>
<td>3) Upgrade of Roma S/S with new transformers and boards</td>
</tr>
<tr>
<td>4) Upgrade of Fig Tree S/S to 2 × 16 MVA</td>
</tr>
<tr>
<td>5) Replacement of new 33 kV panel at Liverpool S/S</td>
</tr>
<tr>
<td>6) Reinforcement of Chisamba Farming area with 45 km of new 33 kV line from Fig Tree S/S</td>
</tr>
<tr>
<td>7) Reinforcement of Makeni-Lusaka West area by uprating at Short-Horn S/S as well as new 11 kV lines within the area</td>
</tr>
<tr>
<td>8) 250 km of new 11 kV lines and over 300 km of 33 kV lines with new S/Ss in Lusaka, and installation of SCADA at main S/Ss</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Implementation Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–3 years</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Estimated Benefit and Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliable power supply to consumers and acceleration of economic development in Lusaka</td>
</tr>
</tbody>
</table>

<table>
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</thead>
<tbody>
<tr>
<td>Nil</td>
<td>US$ 17–20 million</td>
</tr>
</tbody>
</table>
## Project C-2: Rehabilitation and Reinforcement Works of Livingstone Distribution Network

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Project Site</td>
<td>Livingstone Town</td>
</tr>
<tr>
<td>3. Implementing Agency</td>
<td>ZESCO (Zambia Electricity Supply Company)</td>
</tr>
</tbody>
</table>

### 4. Objectives and Justification
Livingstone is located near Victoria Falls, one of the three largest cataracts in the world and an important base for tourism with hotels and lodgings for visitors from the Zambia side. Power distribution to the city has been supported by two 10 MVA transformers; however, one of the transformers recently broke down. Power supply to Livingstone has become a serious situation with frequent rolling brownouts. The remaining transformer cannot stop operating in order to undergo maintenance as there is no spare. Furthermore, most of the 11 kV distribution line is under the ground; thus, maintenance is difficult and damage to the line is severe, with frequent line failure. Reliable power supply is most important for promoting tourism, which is the main industry in this region. Therefore, urgent rehabilitation and restoration are required.

### 5. Project Outline
1. Construction of new 2 × 20 MVA 66/11 kV substation (S/S) on Katimamulio 66 kV line
2. Upgrading of 20 km of existing 11 kV network to 3C 120 mm² XLPE cable network
3. Installing a second 1 × 10 MVA 33/11 kV transformer at the existing S/S
4. Upgrading/refurbishing existing 400 V distribution networks and associated 11/0.4 kV S/Ss

### 6. Implementation Period
2 years

### 7. Estimated Benefit and Beneficiaries
Reliable power supply to consumers and acceleration of economic development in Livingstone

### 8. Estimated Environmental Impact
Nil

### 9. Estimated Cost
US$ 4–6 million
1. Sector  
Power

2. Project Site  
Eastern Province

3. Implementing Agency  
ZESCO (Zambia Electricity Supply Company)

4. Objectives and Justification  
In light of the Zambian Government’s ongoing drive to promote agricultural self-sufficiency in the country, the Eastern Province can play a strategic role in the sector once stable, reliable power supply is secured. The power supply in the Eastern Province is in great need of improvement. The equipment in the power network is quite old, 40 years, and some of it has become obsolete. This leads to frequent outages and very high maintenance and repair costs. Some of the equipment is beyond repair and breakdowns lead to long and extensive power outages in the region. The rehabilitation of the power network in the province needs to be done on an emergency basis. The Lusiwasi 12 MW power station is not only the largest among ZESCO’s small hydropower stations but it is also the backbone of power supply to the Eastern Province. This power station is in a state of disrepair because of old age and lack of spares. Only three of the four units are running, and at considerably reduced capacity with frequent breakdowns. To increase food production by supplying stable power for irrigation facilities, it is crucial to rehabilitate and upgrade the power plant and related transmission/distribution network.

5. Project Outline  
(1) Rehabilitation of Lusiwasi Hydropower Station (12 MW)  
(2) Rehabilitation of Msoro 66 kV Switching Station  
(3) Rehabilitation of Chipata 66/11 kV Substation  
(4) Rehabilitation of Azele 66/33 kV Substation

6. Implementation Period  
2 years

7. Estimated Benefit and Beneficiaries  
Reliable power supply to consumers and acceleration of agricultural development in the region

8. Estimated Environmental Impact  
Nil

9. Estimated Cost  
US$ 12–15 million
**Project C-4: Rehabilitation and Reinforcement Works for Copperbelt Distribution Facilities**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Sector</td>
<td>2. Project Site</td>
</tr>
<tr>
<td>Power</td>
<td>Copperbelt Provinces</td>
</tr>
<tr>
<td>3. Implementing Agency</td>
<td>ZESCO (Zambia Electricity Supply Company)</td>
</tr>
<tr>
<td>4. Objectives and Justification</td>
<td></td>
</tr>
<tr>
<td>Ndola and Kitwe, located in the Copperbelt, are the 2nd and 3rd largest cities after Lusaka, respectively. There are many copper mines nearby, which is the basic industry in Zambia; these cities developed many years ago along with the development of copper mining. The lifespan of the distribution network in both cities has expired; therefore, rehabilitation is required. In addition, with the increase in population and urbanization, the substation capacity is no longer sufficient. It is urgently needed to rehabilitate, reinforce and upgrade the distribution networks including installation of new primary substations. As the 330 kV trunk line supplying power to the copper mines in the Copperbelt passes through both cities, installation of the SCADA system is recommended for the substation. With the introduction of the system, strict monitoring and control from Lusaka would be easier, and it would improve the reliability of power supply.</td>
<td></td>
</tr>
<tr>
<td>5. Project Outline</td>
<td></td>
</tr>
<tr>
<td>(1) Construction of 2 new primary substations with SCADA system in Ndola</td>
<td>(2) Rehabilitation and upgrading of existing distribution network in Ndola</td>
</tr>
<tr>
<td>(2) Rehabilitation and upgrading of existing substations in Kitwe</td>
<td>(3) Rehabilitation of 400 V distribution network in Kitwe</td>
</tr>
<tr>
<td>(3) Rehabilitation of 400 V distribution network in Kitwe</td>
<td>(4) Construction of new substations with SCADA system in Kitwe</td>
</tr>
<tr>
<td>6. Implementation Period</td>
<td>2–3 years</td>
</tr>
<tr>
<td>7. Estimated Benefit and Beneficiaries</td>
<td></td>
</tr>
<tr>
<td>Reliable power supply to consumers and acceleration of economic development in the region</td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td>US$ 20–25 million</td>
</tr>
</tbody>
</table>
Project C-5: Rehabilitation and Expansion Works for ZESCO Training Center in Ndola

| 1. Sector | Power |
| 2. Project Site | Ndola Town |
| 3. Implementing Agency | ZESCO (Zambia Electricity Supply Company) |
| 4. Objectives and Justification | The ZESCO Training Center (ZTC) opened in 1970 in Ndola, one of the major cities in the Copperbelt, to provide ZESCO employees with training mainly on construction and maintenance of transmission and distribution line facilities. The training center, which originally was a farmhouse, is very old and has an adverse effect on the training program. ZESCO is under pressure to disseminate the maintenance and operation technology of the new facilities introduced by the Power Rehabilitation Project (PRP). On the other hand, ZESCO has its own rehabilitation plan for transmission/distribution lines. Therefore, the training of technical staff has become an urgent task. The training facilities and program are out-of-date; therefore, renewal is required in addition to repair of the training center building. |
| 5. Project Outline | (1) Capacity development of the Center’s trainers  
(2) Development of a training curriculum based on the needs of the electricity industry  
(4) Procurement of training equipment/tools  
(5) Stocking of the library with updated literature  
(6) Rehabilitation of buildings including living quarters |
| 6. Implementation Period | 3–4 years |
| 7. Estimated Benefit and Beneficiaries | Capacity development of ZESCO employees and enhancement of quality of electricity supply services |
| 8. Estimated Environmental Impact | Nil |
| 9. Estimated Cost | US$ 2.5–3 million |
Project C-6: Power Development Master Plan in Zambia

1. Sector
   Power

2. Project Site
   Entire Country

3. Implementing Agency
   MEWD (Ministry of Energy and Water Development) / ZESCO (Zambia Electricity Supply Company)

4. Objectives and Justification
   Power supply is a fundamental infrastructure for enhancing the country’s living standard and economy. Therefore, the Zambian Government has set its targets for the year 2010: i) Electricity access rate increased from 20 to 35%, namely 15% in rural areas and 50% in urban areas; and ii) Electricity exports to neighboring countries increased by 300% from the current level. To achieve these targets, the country’s abundant hydropower potential should be steadily and efficiently developed. Moreover, the National Grid should be expanded following the development of hydropower potential. An international power market through SAPP should also be considered in planning the National Grid and power development. An optimum development scenario at minimum cost will be made based on the power demand forecast in the master plan.

   To effectively, efficiently and steadily realize the National Development Plan, such a power development road map should be urgently established before a power crisis occurs.

5. Project Outline
   (1) Investigation of present status of power facilities
   (2) Review of the existing power development plans made by MEWD/ZESCO and SAPP
   (3) Study on present operation conditions including SAPP
   (4) Investigation and study on hydropower potential
   (5) Layout and optimization studies on each potential site including cost estimate
   (6) Power demand forecast
   (7) System planning and analysis (power flow, stability, short-circuit capacity, etc.)
   (8) Preliminary environmental investigation
   (9) Financial and economic analyses

6. Implementation Period
   2 years

7. Estimated Benefit and Beneficiaries
   Effective and efficient hydropower development and enhancement of electrification rate

8. Estimated Environmental Impact
   Nil

9. Estimated Cost
   US$ 1.5–2 million
## Project D-1: Water Supply and Sanitation Sector

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>Water Supply and Sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Project Site</td>
<td>Kafue Town, Lusaka Province</td>
</tr>
<tr>
<td>3. Implement Agency</td>
<td>Ministry of Local Government and Housing, National Water and Sewerage Council (NWASCO)</td>
</tr>
</tbody>
</table>

### 4. Objectives and Justification

Water taken from the Kafue River is treated at Iolanda Water Treatment Plant (WTP) located near Kafue. Generally the plant is in good condition and is being operated properly. The plant was built in 1970 and refurbished in 1989 (mainly Mechanical & Electrical). Generally, life of civil structure is around 50 years and the ones of the mechanical/electrical facilities are around 15 to 20 years. The mechanical and electrical facilities are operated with frequent repair work due to ending life of them. Furthermore, purchase of the accessories and spare parts, which is necessary for repair, is difficult. Therefore, much of the mechanical and electrical facility requires rehabilitation. Furthermore, establishment of computerized radio-communication system is necessary.

### 5. Project Outline

1. Rehabilitation of mechanical and electrical facilities in Iolanda WTP
   - Treatment capacity: 110,000 m$^3$/day
   - Intake facility, raw water pumps, sedimentation tanks, rapid sand filters, high lift pumps, chemical facility, electrical facility, laboratory facility etc.
2. Water proofing work of civil structures to stop leakage in Iolanda WTP.
3. Rehabilitation of mechanical and electrical facility in Chilanga booster pump station.
4. Establishment of computerized radio-communication system.
5. Establishment of appropriate organization for Operation and Maintenance (O&M)
6. Consultancy Services
   - Detailed Design, preparation of bidding documents, and construction supervision
   - Assist for bidding and contract
   - Cost estimate of construction and O&M
   - Enforcement of soft component for personal capacity reinforcement

### 6. Implementation Period

2 years
7. Estimated Benefit and Beneficiaries

(1) Improvement in O&M
(2) Adjust of suitable water production and water quality
(3) Obtaining reliable management of water supply service

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Approximately US$ 20.9 million</td>
</tr>
</tbody>
</table>
Project D-2: Water Supply and Sanitation Sector

1. Sector
   Water Supply and Sanitation

2. Project Site
   Lusaka capital city, Lusaka Province

3. Implement Agency
   Ministry of Local Government and Housing
   National Water and Sewerage Council (NWASCO)

4. Objectives and Justification
   Lusaka Water and Sewerage Company (LWSC) provides water supply and sewerage services to the metropolitan areas of Lusaka. The average daily water production of approx. 200,000 m³ is supplied from 2 sources: 50% from surface water of the Kafue River (50 km away) and 50% from boreholes (about 50 wells) in and around Lusaka City area. The major risks of boreholes associated with the sustainability of the aquifer relate to pollution from sewage, solid waste, agriculture activities, and any other unregulated discharges in and around the Lusaka area.

   Currently, LWSC does not have a long-term strategic development plan for water supply and sanitation facilities. There is an urgent need to launch studies to develop a Water Supply and Sewerage (WSS) Master Plan (M/P) in order to identify long-term investment plans for both services. In addition, there is a need to investigate and develop a new groundwater source in the Lusaka Aquifer to cope with the projected demand in the future. However, further extension of the New Water Treatment Plant near Kafue River is also an alternative to be examined as a cost effective measure for enhancement of water supply capacity.

5. Project Outline
   (1) WSS master plan in metropolitan area of Lusaka, including studies for;
   - Present condition of WSS services
   - Land use plan and estimate future population of study area
   - Aim establishment of WSS services coverage
   - Evaluation and expansion plan of WSS network
   - Decision of water source
   - Selection of priority project

   (2) Feasibility study of priority project
   - Outline design of priority project with cost estimate for construction and O&M
   - Organization of project implementation
   - Project implementation schedule
   - Economic and financial analysis, and establishment of reasonable water tariff

6. Implementation Period
<table>
<thead>
<tr>
<th></th>
<th>1.5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Estimated Benefit and Beneficiaries</td>
<td>The M/P will provide a guideline of WSS development strategy to the government and related sectors. Sufficient and safe water supply, environmental improvement and management improvement of LWSC are expected.</td>
</tr>
<tr>
<td>8. Estimated Environmental Impact</td>
<td>Nil</td>
</tr>
<tr>
<td>9. Estimated Cost</td>
<td>Approximately US$ 2.3 million</td>
</tr>
</tbody>
</table>
### Project D-3: Water Supply and Sanitation Sector

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>Water Supply and Sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Project Site</td>
<td>Kafue Town, Lusaka Province</td>
</tr>
</tbody>
</table>
| 3. Implement Agency | Ministry of Local Government and Housing  
                      National Water and Sewerage Council (NWASCO) |
| 4. Objectives and Justification | New WTP for Extension of Lusaka Water Supply System based on F/S.  
                                Augmentation of water treatment capacity is usually carried out by expansion of the existing WTP in order to avoid increase of number of facilities to be managed. However, existing Iolanda WTP has a problem with the Kafue water resource, which is located downstream of the Industry and Wastewater Treatment Plant (WWTP) in Kafue Town. Accordingly, the raw water for existing Iolanda WTP is contaminated.  
                                One option is to construct an intake facility at the upstream of them and to convey the raw water to new plant to be constructed at the side of existing plant. However, this option has disadvantages in cost requirement and land availability. Consequently, New WTP is desirable to be constructed at upstream of the Industries and Wastewater Treatment Plant in Kafue. |
| 5. Project Outline | (1) Review of F/S  
                      (2) Detail design of New WTP  
                          - Treatment capacity: 110,000 m³/day  
                          - Intake facility, Water treatment facility, Clear water transmission facility, Sludge & Wastewater treatment facility, Chemical facility, Electrical facility, Administration facility, Laboratory facility etc.  
                      (3) Detail design of clear water transmission pipe and booster pump station  
                      (4) Cost estimate for construction and O&M  
                      (5) Execution of bidding and supervision  
                      (6) Enforcement of soft component |
<p>| 6. Implementation Period | 4 years |
| 7. Estimated Benefit and Beneficiaries | (1) Supply of sufficient and safe water |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>(2) Obtaining of reliable water supply service</td>
<td>(3) Improvement of LWSC management</td>
</tr>
<tr>
<td>Nil</td>
<td>Approximately US$ 93.7 million</td>
</tr>
</tbody>
</table>
### Project D-4: Water Supply and Sanitation Sector

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>Water Supply and Sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Project Site</td>
<td>Lusaka capital city, Lusaka Province</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Implement Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Local Government and Housing</td>
</tr>
<tr>
<td>National Water and Sewerage Council (NWASCO)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Objectives and Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presently, only 30% of housings in the LWSC water service area are connected to the public sewerage system. The sewer network is divided into several catchment areas and there are seven Sewage Pumping Stations (SPSs) in the sewer network. The sewage treatment facilities for Lusaka are two conventional treatment plants and five non-conventional plants in the form of waste stabilisation ponds. The two conventional treatment plants serving for Lusaka are hydraulically overloaded with around twice of the maximum design flows.</td>
</tr>
<tr>
<td>In the Manchichi Wastewater Treatment Plant (WWTP), the civil structures were relatively in good condition despite their age and hydraulic over-loading. Some structural refurbishment will significantly extend their useful life and expansion of treatment capacity. All of mechanical and electrical facilities needs complete overhaul and replacement with new instrumentation and control equipment. Many of the treatment units were not operable due to breakdowns, lack of maintenance or lack of spare parts because of long operation years exceeding their life.</td>
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<table>
<thead>
<tr>
<th>5. Project Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Rehabilitation of mechanical and electrical facilities in WWTP</td>
</tr>
<tr>
<td>- Treatment capacity: 36,000 m$^3$/day</td>
</tr>
<tr>
<td>(2) Rehabilitation of mechanical and electrical facilities in five SPSs</td>
</tr>
<tr>
<td>(3) Refurbishment of civil structures in WWTP and SPSs</td>
</tr>
<tr>
<td>(4) Expansion of WWTP</td>
</tr>
<tr>
<td>- Treatment capacity: 36,000 m$^3$/day</td>
</tr>
<tr>
<td>(5) Cost estimate for construction and O&amp;M</td>
</tr>
<tr>
<td>(6) Establishment of appropriate organization for O&amp;M</td>
</tr>
<tr>
<td>(7) Execution of bidding and construction supervision</td>
</tr>
<tr>
<td>(8) Enforcement of soft component</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Implementation Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 years</td>
</tr>
</tbody>
</table>
7. Estimated Benefit and Beneficiaries

(1) Improvement of O&M
(2) Improvement of treated water quality
(3) Prevention of pollution of treated water effluent receiving river

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Improvement of river water quality</td>
<td>Approximately US$ 44.4 million</td>
</tr>
</tbody>
</table>
### Project D-5: Water Supply and Sanitation Sector

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>2. Project Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply and Sanitation</td>
<td>Lusaka capital city, Lusaka Province</td>
</tr>
</tbody>
</table>

3. Implement Agency

- Ministry of Local Government and Housing
- National Water and Sewerage Council (NWASCO)

4. Objectives and Justification

Presently, only 30% of housings in the LWSC water service area are connected to the public sewerage system. The sewer network is divided into several catchment areas and there are seven Sewage Pumping Stations (SPSs) in the sewer network. The sewage treatment facilities for Lusaka are two conventional treatment plants and five non-conventional plants in the form of waste stabilisation ponds. The two conventional treatment plants serving for Lusaka are hydraulically overloaded with around twice of the maximum design flows.

In the Chunga Wastewater Treatment Plant (WWTP), the civil structures were relatively in good condition despite their age and hydraulic over-loading. Some structural refurbishment will significantly extend their useful life and expansion of treatment capacity. All of mechanical and electrical facilities needs complete overhaul and replacement with new instrumentation and control equipment. Many of the treatment units were not operable due to breakdowns, lack of maintenance or lack of spare parts because of long operation years exceeding their life.

5. Project Outline

1. Rehabilitation of mechanical and electrical facility in WWTP
   - Treatment capacity: 9,100 m³/day
2. Rehabilitation of mechanical and electrical facility in one SPS
3. Refurbishment of civil structures in WWTP and SPS
4. Expansion of WWTP
   - Treatment capacity: 9,100 m³/day
5. Cost estimate for construction and O&M
6. Establishment of appropriate organization for O&M
7. Execution of bidding and construction supervision
8. Enforcement of soft component

6. Implementation Period

3.5 years
7. Estimated Benefit and Beneficiaries

(3) Improvement of O&M
(4) Improvement of treated water quality
(1) Prevention of pollution of treated water effluent receiving river

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of river water quality</td>
<td>Approximately US$ 11.2 million</td>
</tr>
</tbody>
</table>
### Project D-6: Water Supply and Sanitation Sector

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>Water Supply and Sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Project Site</td>
<td>Livingstone City, Southern Province</td>
</tr>
<tr>
<td>3. Implement Agency</td>
<td>Ministry of Local Government and Housing, National Water and Sewerage Council (NWASCO)</td>
</tr>
<tr>
<td>4. Objectives and Justification</td>
<td>The Livingstone WTP was established in 1930 as the first phase, the WTP was expanded in 1950 as the second phase, and next expansion was carried out in 1980 as the third phase. The facility of first phase is not being utilised because of more than 70 years operation. Water taken from Zambezi River is treated at the Livingstone WTP. Hydraulically, the WTP should be able to treat to its design water supply rate of 38,000 m$^3$/day except the first phase facility. However current measured volume indicates only 74% of design rate or about 28,000 m$^3$/day is the current operation performance (Water production rate) due to decrepitude of facilities. In 2015, water supply coverage population is anticipated to be increased to about 150,000 and water supply rate is anticipated to be raised to 38,000 m$^3$/day (coverage rate 100%). Accordingly, the improvement project of the Livingstone WTP is judged as the high priority project for Livingstone city.</td>
</tr>
<tr>
<td>5. Project Outline</td>
<td>(1) Rehabilitation of mechanical and electrical facilities - Treatment capacity: 38,000 m$^3$/day - Intake facility, raw water pumps, sedimentation tanks, rapid sand filters, water supply facility, chemical facility, electrical facility, laboratory facility etc. (2) Refurbishment of civil structures (3) Establishment of computerized radio-communication system. (4) Establishment of proper organization for Operation and Maintenance (O&amp;M) (5) Consultancy Services - Detailed Design, preparation of bidding documents, and construction supervision - Assist for bidding and contract - Cost estimate of construction and O&amp;M - Enforcement of soft component for personal capacity reinforcement</td>
</tr>
<tr>
<td>6. Implementation Period</td>
<td>3.5 years</td>
</tr>
</tbody>
</table>
7. Estimated Benefit and Beneficiaries

(1) Improvement of O&M
(2) Securing sufficient water production and water quality
(3) Obtaining of reliable water supply service

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Nil</td>
<td>Approximately US$ 10 million</td>
</tr>
</tbody>
</table>
**Project D-7: Water Supply and Sanitation Sector**

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>2. Project Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply and Sanitation</td>
<td>Livingstone City, Southern Province</td>
</tr>
</tbody>
</table>

3. Implement Agency

- Ministry of Local Government and Housing
- National Water and Sewerage Council (NWASCO)

4. Objectives and Justification

Receiving wastewater rate of existing WWTP is not identified accurately due to lack of any monitoring devices. However, the wastewater rate is estimated at about 23,000 m³ as the average daily flow being 80% of water supply rate of SWSC. The Livingstone WWTP is the open cut type stabilisation pond with no maintenance activity. Existing WWTP was re-excavated in 1998. Embankment of the ponds is made of compacted sand without any impermeable lining. Consequently, wastewater exudes from the embankment, which deteriorates the surrounding environment.

Improvement of the WWTP must be conducted including provision of impermeable lining work, and treatment method is desirable to be changed to the conventional method (e.g. Oxidation Ditch).

5. Project Outline

   (1) Case –1; Stabilisation pond make to the concrete structure
   (2) Case –2; Change to the conventional type WWTP
      - Treatment capacity: 30,000 m³/day
   (3) Provision of instrumentation equipment and laboratory
   (4) Consultancy Services
      - Detailed Design, preparation of bidding documents, and construction supervision
      - Assist for bidding and contract
      - Cost estimate of construction and O&M
      - Enforcement of soft component for personal capacity reinforcement

6. Implementation Period

   Case –1; 3 years / Case –2; 3.5 years

7. Estimated Benefit and Beneficiaries

   (2) Improvement of O&M
   (3) Improvement of treated water quality
<table>
<thead>
<tr>
<th>8. Estimated Environmental Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect of surrounding environment and prevent pollution of Zambezi River</td>
</tr>
<tr>
<td>9. Estimated Cost</td>
</tr>
<tr>
<td>Case –1; Approximately US$ 9.9 million</td>
</tr>
<tr>
<td>Case –2; Approximately US$ 24.7 million</td>
</tr>
</tbody>
</table>
Project E-1: Master Plan Study for Development of Manufacturing Sector, particularly SME Industries in Zambia

<table>
<thead>
<tr>
<th>1. Sector</th>
<th>2. Project Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing Industry</td>
<td>Zambia</td>
</tr>
</tbody>
</table>

3. Implementing Agency
MOCTI (Ministry of Commerce, Trade & Industry)

4. Objectives and Justification
The Zambian economy is still dependent on the export of copper and other resources, and most of the industrial products, including semi-finished products, are imported, accounting for 60% of the total imports. The manufacturing industry has been severely hit by increasing imports especially in the last couple of years, remaining in long-term stagnation, because of problems accessing credit, as well as technical and marketing problems. As a result, imports are increasing rapidly and the trade gap is increasing as well, requiring fosterage of indigenous industries that will make use of domestic resources and increase the degree of processing so as to increase the value added.

Under such a situation, there is a pressing need to vitalize indigenous companies that can utilize domestic resources and fill the domestic demand, by analyzing the domestic market, raw materials availability, and technical level, selecting promising companies, and taking measures for industrial promotion in order to foster import-substitution industries. When the competitiveness is sufficiently strengthened to compete with imports, measures for promotion of the export industry should be taken in the second stage, targeting the market in the neighboring countries. It would be effective to improve support measures for the manufacturing industry, inclusive of the financing and tariff systems for fosterage of the manufacturing industry, which have been raised as live issues for the manufacturing industry as a whole.

5. Project Outline
1) Study on actual situation of industry in Lusaka, Copperbelt, and Livingston, as well as problems faced by individual companies
2) Reexamination of the government’s present support measures for financing, management, technology upgrading, human resource development, marketing, and environmental conservation
3) Examination of the present activities of government agencies concerning industrial development support and assistance services and their capacity development needs
4) Present situation of the financial system (tariff and taxation systems) for industrial development, and study on problems
5) Proposal of specific measures for effective marketing, including promotion of SMEs
   Implementation of specific support programs and formulation of implementation schedule

6. Implementation Period
1 year
7. Estimated Benefit and Beneficiaries
After examination of the existing promotion measures, an industrial master plan and related policies that include effective measures for import-substitution industries development should be formulated for effective use of domestic resources and expansion of domestic value-added productivity, and then the international competitive power should be strengthened in the second stage to promote industrialization as an exporting country in the neighboring countries. Growing by leaps and bounds into an industrial product exporting country from a mere resource exporting country, Zambia can provide a successful example to the neighboring countries as a leader of industrialization.

<table>
<thead>
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<tbody>
<tr>
<td>Promotion of environmental consciousness in accordance with industrial development.</td>
<td>US$ 1 million</td>
</tr>
</tbody>
</table>
Appendix
<List of Contacted Persons>

**General**

Ministry of Foreign Affairs
- Mr. Moses Mbumba, Director, Human Resource & Administration
- Ms. Anne Luzongo Mtambo, Director, Development cooperation & International Organization
- Mr. Frank Mumba, Economist, Development cooperation
- Mr. Lubasi Mungandi, Economist, Development cooperation

Embassy of The Republic of Zambia
- Mr. Godfrey S. Simasiku, Ambassador of The Republic of Zambia
- Mr. Sylvester Mundanda, First Secretary

Japanese Institutions

Embassy of Japan
- Mr. Masaaki Miyashita, Ambassador of Japan
- Mr. Tatsuro Koga, First Secretary , Economic-Cooperation
- Mr. Tomoyuki Zaitsu, First Secretary , Economic-Cooperation
- Mr. Takahito Katayama, Second Secretary, Economic-Cooperation

Japan International Cooperation Agency (JICA)
- Mr. Eiji Inui, Resident Representative
- Mr. Tatsuya Yanagi, Project Formulation Adviser
- Ms. Haruko Awano, Project Formulation Adviser

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Ministry of Communications and Transport
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- Mr. Lazarus Mwiinga, Director of Planning
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National Road Fund Agency
- Mr. Raphael Mabenga, Acting Execive Director
- Mr. Baison Banda, Accountant - ROADSSIP
- Mr. Alllington Bata, Zambia Daily Mail Limited Chief Accountant

Ministry of works and supply
- Mr. Bizwayo N. Nkunika, Permanent secretary
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Mr. Chaslophes Chileshe, Acting Director, Department of Water Affairs

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Energy Regulation Board
Mr. George Mubipe, Director, Economic Regulation
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Mr. Christopher Nthala, Director, Generation & Transmission
Mr. Alvin Monga, Project manager, Transmission Power Rehabilitation Project
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Ms Elistiwa Mwelwa, Environment
Mr. Kennedy Sichone, Project Manager, Rural Electrification Projects

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Mr. Morecome Mumba, Senior Manager, Human Resource Development & Placements
Mr. Daniel Sichela, Principal Engineer, Technical Support Services, Engineering Department
Ms. Cynthia M. Kunda, Principal Officer, Business Planning
Ms. Raceal Mubipe, Senior Marketing Officer, Business Planning
Mr. Elias Sichande, Senior Electrical Engineer, Generation Projects
Mr. Edwin Kunda, Project Engineer, Generation Projects

**Water Supply and Sanitation**
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  Mr. Maswabu M. Maimbolwa, Permanent Secretary
  Mr. Peter Lubambo, Director, Development International & Support Services
  Cledwin Mulambo, Project Manager, Central Province Eight Centres Water Supply Project
Lusaka City Council
  Mr. Timothy Hakuyu, Town Clerk
National Water and Sewerage Council (NWASCO)
  Mr. Oswald M Chanda, Director, The Water Regulator
  Mr. Samuel Gong’a, Manager, Devolution Trust Fund (DTF)
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  Mr. Dennis D. Mwanza, Managing Director
Southern Water & Sewerage Company Limited
  Mr. Ndilakulanpa Hamalambo, Regional Manager
  Mr. Charles Shindaile, Director Operations

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  Mr. Fredson Yamba, Director of Planning
  Mr. Abraham Chiwana, Domestic Trade
  Mr. Christopher Chileshe, Foreign Trade Department
  Mr. Mukela Munalula, Planning & Investment
Ministry of Finance and National Planning
  Mr. David Ndopu, Director
Ministry of Science, Technology and Vocational Training
  Ms. Pola P.L.M. Kimena, Acting Director
Zambia Association of Chambers of Commerce and Industry
Mr. Justin M. Chisulo  
TEVETA (Technical Education, Vocational and Entrepreneurship Training Authority)  
  Mr. Tajima Noriaki, JICA Adviser  
  Mr. David. C. Chakonta, Director Development Division  
ZAM (Zambia Association of Manufacturers)  
  Mr. Diego Casilli, Chairman of ZAM / Managing Director, Amanita Group of Company  
ZCSMBA (The Zambia Chamber of Small & Medium Business Association)  
  Mr. Maxwell D. Sichula, Executive Secretary  
ZPA (Zambia Privatization Agency)  
  Mr. Andrew Chipwende, Chief Executive officer  
Zambia Competition Commission  
  Mr. T G. Kaira, Director  
Zambia Investment Centre  
  Mr. Chalimba C. Phiri, Director Marketing & Investment Promotions  
  Mr. Musiyalela Sitali, Manager of Business Development & Aftercare Service  
  Ms. Jessica Chombo, Manager of Project Development  
Zambia Export Processing Authority (Multifacility Economic Zone)  
  Mr. Fabiano Lukashi, Managing Director  
  Mr. Isam M Mazuba, Manager Compliance and Monitoring  
  Ms. Margaret Chimanse, Manager Marketing and Public Relations  
Lamasat International LTD.  
  Mr. Mohmoud A. Ahmad  
Lamise Investment Limited / Batul Investment Limited  
  Mr. Ali Kassem Ahmed, General Manager  
Stando Investments Limited  
  Mr. Nonde M. Mandona, C.E.O
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“One Village, One Product” Campaign

March 2006

Ministry of Economy, Trade and Industry

Appendix-7
“One Village, One Product” (OVOP) Campaign is a strategic movement for local people to identify local products of which they are proud and develop them into competitive products which will be accepted in the domestic market as well as the global market, which will also greatly contribute to reinvigoration of local economies.

Japan announced a comprehensive development package, "Development Initiative for Trade," on the occasion of the WTO Hong Kong Ministerial Conference held in last December with a view to promoting the development of developing countries through the Doha Round and help them reap further benefits of the multilateral trading system. As part of this initiative, the Government of Japan supports initiating OVOP movement in developing countries.

Photo: Japan International Cooperation Agency (JICA)
Assistance to LDCs from Japan

Identification of promising products

Development of competitive products

Commitment and involvement of the government

LDCs

Assistance

- Dispatching experts.
- Human resource development in Japan for to acquire expertise.
- Providing business opportunities, i.e., exhibitions, fairs and business matching.
Progress of OVOP Campaign (1)

1. Opening of the OVOP Campaign with the LDC ambassadors (January 31)
   Minister Nikai directly explained the purpose and contents of the Campaign to the LDC ambassadors assigned to Japan and asked them to participate in the Campaign as well as to identify promising products.

2. Exhibitions
   (1) Mekong Exhibition (February 21-24: Tokyo)
   - Featuring products from Laos, Cambodia, Myanmar, Thailand and Vietnam.
   (2) FOODEX 2006 (March 14-17: Makuhari)
   - Displaying food products from developing countries at the international food trade fair.
(3) Pacific Islands Exhibition (May 25-30, Tokyo)
   - Featuring products from Pacific Islands such as Kiribati and Samoa.

(4) African Development Partnership Exhibition (September 2-4, Tokyo)
   - Focusing on products of developing countries in Africa.

(5) Regional Exhibitions
   Exhibitions will be held nationwide in various regions in Japan at facilities including JETRO FAZ (Foreign Access Zone) support centers.

(6) Exhibitions in the lobby of Ministry of Economy, Trade and Industry Building
3. Exhibitions and sales at International Airports
Narita Tokyo International Airport from March 25
Kansai International Airport from April 1
Central Japan International Airport from April 9
Kobe Airport from April 15

4. Assistance for “OVOP” Projects in Least Developed Countries and Others
We will support developing “OVOP” movements from a medium and longer-term perspective so that LDCs and others can improve their capability in developing and exporting their promising products.
- Dispatch experts to help identify promising products and advise on how to improve their products.
- Support human resources development by receiving trainees to Japan.
- Provide information related to OVOP and others.
Examples of OVOP Products in Japan and Overseas

In Japan
- Kabosu (Japanese Citrus) Juice
- Fresh-packed Dried Fish
- Japanese Noodles
- Candles
- Bamboo Baskets
- Porcelain

Overseas
- Porcelain
- Bamboo Baskets
- Candles

"One Village, One Product"
This work was subsidized by the Japan Keirin Association through its Promotion funds from KEIRIN RACE.