

**BASIC DESIGN STUDY REPORT
ON
LIVING ENVIRONMENTAL IMPROVEMENT PROJECT FOR
UNPLANNED URBAN SETTLEMENTS IN LUSAKA
IN
THE REPUBLIC OF ZAMBIA**

AUGUST 2003

**JAPAN INTERNATIONAL COOPERATION AGENCY
NIPPON KOEI CO., LTD.**

PREFACE

In response to a request from the Government of the Republic of Zambia, the Government of Japan decided to conduct a basic design study on Living Environmental Improvement Project for Unplanned Urban Settlements in Lusaka and entrusted the study to the Japan International Cooperation Agency (JICA).

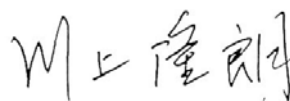
JICA sent to Zambia a study team from March 2 to April 16, 2003.

The team held discussions with the officials concerned of the Government of Zambia, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Zambia in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Zambia for their close cooperation extended to the teams.

August, 2003



Takao Kawakami

President

Japan International Cooperation Agency

August, 2003

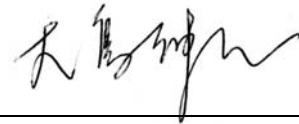
Letter of Transmittal

We are pleased to submit to you the basic design study report on Living Environmental Improvement Project for Unplanned Urban Settlements in Lusaka in the Republic of Zambia.

This study was conducted by Nippon Koei Co., Ltd., under a contract to JICA, during the period from February, 2003 to August, 2003. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Zambia and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

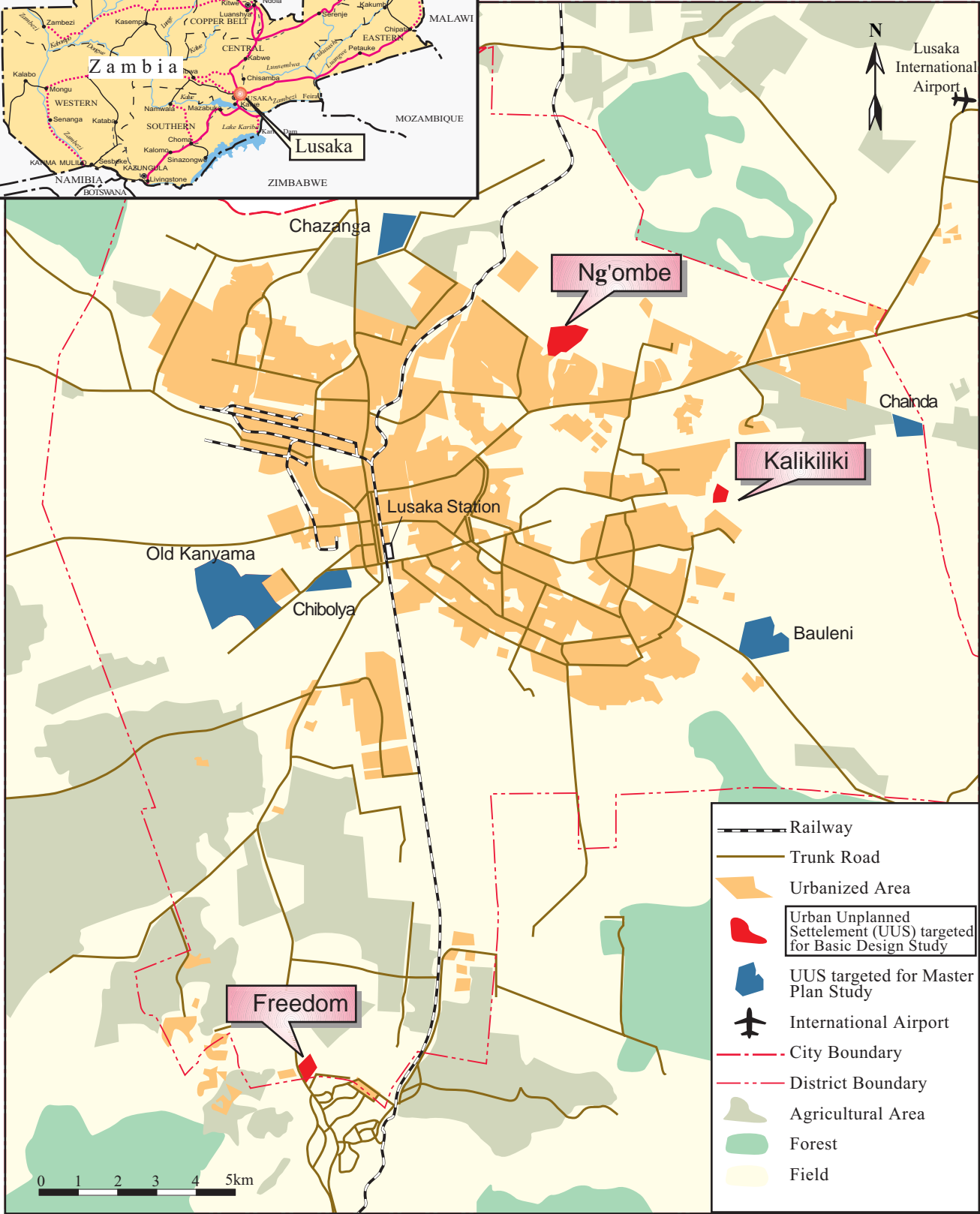
Very truly yours,



Nobuhiro Oshima

Chief Consultant,
Basic design study team on
Living Environmental Improvement
Project for Unplanned Urban
Settlements in Lusaka
Nippon Koei Co., Ltd.

Location Map



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ABBREVIATIONS

1 ORGANIZATION

(1) International Organization

IMF	International Monetary Fund
UNICEF	United Nations International Children's Emergency Fund
WB	World Bank
WHO	World Health Organization

(2) Governmental Organization

CBH	Central Board of Health
Dfid	Department for International Development
DHMB	District Health Management Board
DHMT	District Health Management Team
GOJ	Government of Japan
GRZ	Government of the Republic of Zambia
JICA	Japan International Cooperation Agency
KDHMB	Kafue District Health Management Board
KDHMT	Kafue District Health Management Team
LCC	Lusaka City Council
LCC-DPH	Lusaka City Council (Department of Public Health)
LDHB	Lusaka District Health Board
LDHMT	Lusaka District Health Management Team
LWSC	Lusaka Water & Sewerage Company
MFNP	Ministry of Finance and National Planning
MLGH	Ministry of Local Government and Housing
MOH	Ministry of Health
NWASCO	National Water and Sanitation Council
PHMB	Province Health Management Board
USAID	United States Agency for International Development

(3) NGO

AMDA	Association of Medical Doctors of Asia
CARE	Cooperative for Assistance and Relief Everywhere
CCF	Christian Children's Fund
HUZA	Human Settlements of Zambia
PROSPECT	Programme of Support for Poverty Elimination and Community Transformation
PUSH	Programmes Urban Self-Help
PoCMUS	Promotion of Community Managed Urban Services
ZOCS	Zambia Open Community School

2 Others

ABO	Area-Based Organization
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BHN	Basic Human Needs
CBO	Community Based Organization
CHW	Community Health Workers
DIP	Ductile Iron Pipe
EHC	Environmental Health Committee
EHT	Environmental Health Technician
FY	Fiscal Year
GDP	Gross Domestic Product
GMP	Gross Monitoring Promotion
GNP	Gross National Product
GSP	Galvanized Steel Pipe
HC	Health Center
NGO	Non Governmental Organization
NHC	Neighborhood Health Committees
NP	Nutrition Promoter
O&M	Operation & Maintenance
PDM	Project Design Matrix
PEP	Polyethylene Pipe
PHAST	Participatory Hygiene and Sanitation Transformation
PHC	Primary Health Care
PRSP	Poverty Reduction Strategy Paper 2002-2004
PSRP	Public Service Reform Paper
PVC	Polyvinylchloride Pipe
RDC	Resident Development Committee
SLP	Sustainable Lusaka Programme
TA	Tap Attendant
TOT	Training of Trainers
UPS	Uninterruptible Power Source
UUS	Unplanned Urban Settlements
VIP	Ventilated Improved Pit
WSMB	Water Supply Management Board
ZDC	Zone Development Committee
ZAMTEL	Zambia Telecommunications Company Limited
ZESCO	Zambia Electricity Supply Corporation Limited

MEASUREMENT UNITS

Extent

cm² = Square-centimeters (1.0 cm x 1.0 cm)

m² = Square-meters (1.0 m x 1.0 m)

km² = Square-kilometers (1.0 km x 1.0 km)

ha. = Hectares (10,000 m²)

Length

mm = Millimeters

cm = Centimeters (cm = 10 mm)

m = Meters (m = 100 cm)

km = Kilometers (km = 1,000 m)

inch = Inch (inch = 2.54 cm)

Currency

US\$ = United State Dollars

(US\$1.0 = J¥116 = Kwacha 4,801)

JPY = Japanese Yen

Kwacha 1.0 = JPY 0.0252

Others

lpcd = liter per capita per day

% = Percent

Hz = Hertz

W = Watt

pcu = passenger car unit

ppm = parts per million

Volume

cm³ = Cubic-centimeters

(1.0 cm x 1.0 cm x 1.0 cm)

m³ = Cubic-meters

(1.0 m x 1.0 m x 1.0 m)

lit., l = Liter (1,000 cm³)

Weight

gr. = Grams

kg = Kilograms (1,000 gr.)

ton = Metric tonne (1,000 kg)

Time

sec. = Seconds

min. = Minutes (60 sec.)

hr. = Hours (60 min.)

d = day

SUMMARY

Zambia, which is located on a highland in Sub Sahara surrounded by Angola, Congo, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, and Namibia, has a population of 9.959 million and an area of 753,000 km². Most of the country is located on a highland with altitude of around 1,300m while the hilly areas and mountainous areas are partially located in the country.

The Government of the Republic of Zambia (GRZ) has been promoting the political constitutions such as the liberty of exchange, privatization of public enterprises, abolition of various prices controls, introduction of a cash-budget-system and public reform under the assistance of the World Bank (WB) and International Monetary Fund (IMF) since 1991. The macro-economic indicators including the financial deficit and inflation rate have been improved by the effort of GRZ. Because the economic structure depended on the export of copper (representing more than 50% of total export amounts) remains, the results of economic reform are still not resulting in an increase of employment and production. Besides GRZ has been making efforts on diversification of agricultural (tobacco, flowers, etc.) and the other industries (cobalt), and export amounts of non-traditional industries reaches about 1/3 of total exports. The GDP growth ratio of Zambia reached 3.5% in 2000, thanks to production increase of grain and non-traditional products. Zambia, one of the debtor nations, faces a serious problem on US\$7.2 billion of cumulative liability, which is equivalent to two times the national GNP of US\$ 3.0 billion.

Under the economic circumstances mentioned above, the population of Lusaka city reached about 1.6 million in 2000, because of the population influx from local areas into the city. Most of the influx population resides in the Unplanned Urban Settlements (UUSs), commonly called ‘Compounds’, where more than one million low-income residents live. Living conditions of UUSs are quite low where social services such as public transport, utilities, and garbage treatment are sporadically provided.

The Government of the Republic of Zambia (GRZ) asked the Government of Japan (GOJ) for technical cooperation to prepare a social service improvement plan in the UUSs. The implementation of this, entitled “The Study on Environmental Improvement of Unplanned Urban Settlements in Lusaka” (hereinafter referred as to the Master Plan Study) was entrusted to the Japan International Cooperation Agency (JICA). The Master Plan Study was conducted from March 1999 to July 2001 and the action area plan was formulated.

Based on the action area plan, GRZ submitted a request for a Japan’s Grant Aid Scheme to GOJ in August 2001. The request aims to develop a water supply system for safe and healthy drinking water, and health and hygiene education in three UUSs such

as Ng’ombe, Freedom, and Kalikiliki and community center construction in four UUSs (the three UUSs above and Chibolya). Those projects were selected as the priority projects/programs in the short-term plan of the action area plan. The request covers four projects to cover the different sectors as mentioned below.

- 1) Construction of the water supply systems, of which communities carry out operation, maintenance, and levy collection in three UUSs (Ng’ombe, Freedom, and Kalikiliki). The systems are required to secure a water consumption of 30 l/person/day and accessibility within 15 minutes.
- 2) Construction of the community centers in four UUSs. Proposed functions of the community centers are listed in the following table.

Functions Requested for the Community Centers

UUS	Water Levy Collection Room	Health Sub Center	Meeting Room	RDC Office	LCC Site Office	Others (toilet, kitchen)	Type of Community Center
Chibolya	-	○	○	-	-	○	C
Ng’ombe	○	-	○	○	-	○	B
Freedom	○	○	○	○	○	○	A
Kalikiliki	○	○	○	○	○	○	A

Note 1: Symbol (○) indicates functions proposed in the request.

Note 2: RDC- Resident Development Committee, LCC- Lusaka City Council

- 3) Promotion of health and hygiene behaviors in three UUSs of Ng’ombe, Freedom, and Kalikiliki.
- 4) Capacity building to develop community-based operation and management systems for water supply services in three UUSs, namely Ng’ombe, Freedom, and Kalikiliki.

In response to the request of GRZ, the Government of Japan decided to execute ‘The Basic Design Study on Living Environmental Improvement Project for Unplanned Urban Settlements in Lusaka in the Republic of Zambia’ (the Study). JICA dispatched the Basic Design Study Team to Zambia during the period from March 2, 2003 to April 16, 2003. The Basic Design Study Team conducted the field survey in the Study Area as well as discussions with Zambian governmental organizations concerned. After works in Japan, JICA sent to Zambia the Draft Final Report Explanation Team during the period from July 13, 2003 to July 21, 2003.

In the field survey period, the Basic Design Study Team conducted the confirmation of purposes and contents of the request, study on the national development plans and the activities of other donors, the study on implementation organization and its capacity and O&M system, site investigations on the target three UUSs (Ng’ombe, Freedom, and Kalikiliki), topographic surveys, and social surveys.

During the field survey period the validity and necessity of the requested project on the basis of the following current situation and issues of three UUSs was confirmed. Although Lusaka Water and Sewerage Company (LWSC) supply water to a part of each settlement, the served area and water supply volume are quite limited. Therefore the residents face the suspension of water supply and do not have confidence in water supply by LWSC. Since the communities, at present, have no community center facilities as a spatial base for the community activities such as O&M of the water supply facilities and financial management, the Resident Development Committee (RDC) rents a private house or a church for their activities. Since the residents in the three UUSs face the issues on water and sanitation caused by water-related diseases such as malaria, diarrhea, other water born diseases, and respiratory diseases, it is necessary to improve the sanitary conditions. Therefore it is essential to secure safe water and to carry out the health and hygiene education continuously. It is judged that the capacity building is indispensable, taking lack of overall capacities in the communities in Freedom and Kalikiliki and shortage of the training, monitoring and evaluation capacities in Ng'ombe into consideration.

'Poverty Reduction Strategy Paper (PRSP) 2002-2004', which was prepared by GRZ in April 2002, is the long term and comprehensive strategy and policy to implement poverty reduction by means of a participatory approach and pointed out that water supply and sanitary improvement are the most important measures. The comprehensive structure plan for Lusaka, the 'Lusaka Integrated Development Plan for 2010', which was formulated by the assistance of the World Bank in June 2000, is placed for the City Plan of Lusaka. The comprehensive structure plan indicated that aged and inadequate water supply facilities were an obstacle to develop a sound living environment and a social economy, and recommended that it is urgent to secure safe and stable water supply in Lusaka, including the unplanned urban settlements, and to accelerate collaboration between LWSC and RDC. Although the 'Lusaka-Ndora Community Strengthening Plan' prepared by MLGH recommended that the main theme be defined as institutional development on community-based organizations, capacity building, improvement of social services in UUSs by collaboration between NGOs and RDC, the concrete measures of community empowerment have not been taken by MLGH. In the National Health Strategic Plan (2001-2005), one of the priority areas is the improvement of public health, with emphasis given to water and sanitation. The requested Project is suitable for the policy of the above-mentioned plans since the Project aims at safe water supply with community-based activities. Implementation of the Project under the Japanese Grant Aid Scheme is judged to be significant and proper and is coordinated with the Zambian national policy.

Other donors such as WB, USAID, Irish Aid, and UNICEF, as well as NGOs, including CARE have been conducting the various activities on the similar projects/programs (water supply projects, community empowerment) in Zambia.

Besides, it is confirmed that there is no duplication of the projects by other donors or NGOs in the target three UUSs (Ng'ombe, Freedom, and Kalikiliki). Since a community center for Chibolya was constructed by CARE PUSH, the community center is excluded from the Project.

Through the field survey, the requested projects, exclusive of the community center construction of Chibolya, were judged to be technically and financially significant and proper as a Japanese Grant Aid Scheme. In order to improve living environmental conditions in the UUSs, the Grant Aid Scheme aims to provide funds to construct water supply facilities and community centers and implement soft component programs consisting of health and hygiene education and capacity building of communities for O&M. The contents and plans of the basic design of the Project are shown below.

The basic design of the water supply projects is planned on the basis of a unit water demand of 30 l/person/day and walking time to the public tap stands (water points) of less than 10 minutes. The served population in 2008 is projected to be 61,000 in Ng'ombe, 11,000 in Freedom, and 14,000 in Kalikiliki. The daily water demand in 2008 is 1,830 m³/day in Ng'ombe, 330 m³/day in Freedom, and 420 m³/day in Kalikiliki. The community centers are planned to consist of (1) meeting room, (2) levy collection room (including a vault), (3) LCC site office, and (4) RDC office. Apart from these rooms, the community center includes a kitchen, storage room, toilet with septic tank, and security office as the surrounding facilities. The health and hygiene education involves establishment of the education and training organs as well as human resource development. Also, the capacity building focuses on support to community-based operation and management for water supply services and community centers in the three UUSs.

(1) Basic Design Plan of Water Supply Project

The basic design plan for the water supply projects is presented in the following table.

Basic Design Plan for Water Supply Projects

Parameter	Ng'ombe	Freedom	Kalilikiki
Design Population (persons)	61,000	11,000	14,000
Design Unit Water Consumption (lpcd)	30	30	30
Daily Water Demand (m ³ /d)	1,830	330	420
Average Daily Water Supply (m ³ /d)	2,013	363	462
Maximum Daily Water Supply (m ³ /d)	2,215	400	509
Number of Boreholes (borehole)	2	1	1
Design Water Yield per Borehole (l/sec)	21	7	10
Number of Submersible Pumps (unit)	2	1	1
Number of Chlorinators (unit)	2	2	2
Capacity of Elevated Tank (m ³)	300	100	100
Height of Elevated Tank (m)	10	10	10
Length of Transmission Pipeline (km)	2.4	0.1	1.0
Length of Distribution Pipeline (km)	9.8	3.6	4.6
Number of Public Tap Stands (place)	55	20	25

(2) Basic Design Plan for Community Center Projects

The basic design plan for community center projects is presented in the following table.

Basic Design Plan for Water Supply Projects

Room	Scale (Floor Area: m ²)	Notes
1. Center Building		<ul style="list-style-type: none"> • 1 person (permanent)
LCC Site Office	2.5m x 3m =7.5m ²	<ul style="list-style-type: none"> • 2 persons (Chairperson and secretary)
RDC Office	2.5m x 3m =7.5m ²	<ul style="list-style-type: none"> • 2 persons (Cashier and Accountant), incl. safety room
Levy Collection Room	3m x 3m =9.0m ²	<ul style="list-style-type: none"> • 30 persons (maximum number of attendants for health and hygiene education)
Meeting Room	5m x 7.5m =37.5m ²	
Kitchen	2m x 3m =6.0m ²	<ul style="list-style-type: none"> • Corridor, etc.
Others	22.5m ²	
Sub-total	90.0m ²	
2. Surrounding Facilities		
Security Office	1.5m x 2.0m =3.0m ²	
Flush Toilet	5m x 1.5m =7.5m ²	<ul style="list-style-type: none"> • Water closet for male: urinal 1/ pot 1 • Water closet for female: pot 1 • Incl. septic tank
Total	100.5m ²	

(3) Basic Design Plan for Health and Hygiene Education

The basic design plan for health and hygiene education for communities is presented in the following table.

Basic Design Plan of Health and Hygiene Education

Item	Output
(1) Strengthening of implementation system of health and hygiene education	(1) Health and hygiene education plan (Documents on health and hygiene education plan, Document of education schedule, Document of budget assignment, Organization chart of implementation) (2) Manuals for trainers (Manuals, Other supplemental didactic materials) (3) Documentation of monitoring and evaluation methodology of health and hygiene education (Guideline of monitoring and evaluation, Indicators of monitoring and evaluation) (4) Results of monitoring and evaluation (Record of monitoring and evaluation) (5) Results of training courses by EHTs (Record of training courses, including number of courses, topics of courses, and comments and recommendations)
(2) Human resource development of health and hygiene education	(1) Increase in knowledge on health and hygiene of training participants before and after the training (Evaluation test, Observation record during training courses and workshops) (2) Increase in education skills of training participants before and after the training (Evaluation test, Observation record during training courses and workshops, Training plan and training report prepared by the trained participants) (3) Record of training and home visits by the trained participants for community people (Report of training, Report of home visit) (4) Increase in knowledge, and change in attitude, and practices of community people on health and hygiene (Questionnaire to community people, Report of trainers and EHTs)

(4) Basic Design Plan for Capacity Building for the Community

The basic design plan for capacity building for the community is presented in the following table.

Basic Design Plan for Capacity Building for Community

Item	Output
1. Strengthening of Community-based Organizations	
(1) Capacity Building of RDC, WSMB and Organization for Health and Hygiene Education	(1) Pre- and post level of capacity (Score Sheet, and Radar Chart) (2) Organization chart of RDC, WSMB, and Organization for Health and Hygiene Education (3) Capacity building strategy for RDC, WSMB, and Organization for Health and Hygiene Education
(2) Recommendation of Rules for RDC, WSMB and Organization for Health and Hygiene Education	(1) Document of recommendation for Rules for RDC, WSMB, and Organization for Health and Hygiene Education (2) Draft Document of Roles and Responsibilities of each Organization or Position
(3) Human Resource Development for Community-based Activities incl. Health and Hygiene Education	(1) Manual on Human Resource Development of Community-based Activities (2) Manual on Human Resource Development of Community-based Activities incl. Health and Hygiene Education
(4) Financial Management of RDC	(1) Financial Management Manual for Water Supply Services (2) Record of Training for Financial Management of Water Supply Services (3) Account book (4) Bankbook (5) Record of Training for Financial Management of other community-based activities
2. Training for O&M of Water Supplies and Community Centers	
(1) Training for Operation and Management of Water Supplies	(1) O&M Manual for Water Supply Services (2) Record of Training for Operation and Management of Water Supply Services (3) Document of recommendation on consensus formation for O&M of Water Supply Services (Salary and role of WSMB members and member rules including water tariff and registration fee)
(2) Training for Operation and Management of Community Centers	(1) Manual of O&M for Community Center (2) Record of Training for O&M for Community Center

The Ministry of Local Government and Housing (MLGH) is a representative organization of the Zambian side that is responsible for the Project, while Lusaka City Council (LCC) is in charge of implementation of the Project. The Project will be implemented by LCC with the technical support of LWSC and Lusaka District Health Management Team (LDHMT). Each Resident Development Committee (RDC) will be expected to organize a “Water Management Committee” and to promote a participatory approach in implementation and formation of the O&M structure. RDC will also take the roles of the major trainers for health and hygiene education.

During explanation of the draft final report from July 13 to July 21, 2003, it is confirmed in the Minutes of Discussion signed by both parties on July 17, 2003 that GRZ agreed and accepted, in principle, the components of the draft final report of the Basic Design Study on Living Environmental Improvement Project for Unplanned Urban Settlements in Lusaka explained by the Draft Final Report Explanation Team.

The Project will be executed under the Japan's Grant Aid Scheme. After conclusion of the Exchange of Notes (E/N), the Project will be executed for 20 months including detailed design, tendering, evaluation and contract, construction and soft components.

The total cost of the Project is estimated at 476 million Japanese Yen (Japanese side: 473 million Japanese Yen, Zambian side: 2.75 million Japanese Yen). Undertakings of GRZ are provision of electric distribution line to each site, securing of land, and fence construction for the community centers.

The Project under Japanese Grant Aid Scheme is consequently judged to be significant and proper from viewpoints of consistency in the Zambian national policy and the following.

- (i) The beneficiaries of the Project will be a huge number of low-income residents (86,000).
- (ii) The Project contributes to improvement of sanitary conditions such as reduction of water born diseases and improvement of water supply conditions.
- (iii) The Project contributes to saving the labor of women and children for drawing water.
- (iv) The O&M of the Project can be easily carried out by the Zambian side with its human resources and technologies.

The Project will be implemented more effectively and smoothly, when the following issues are improved and undertaken.

- (i) MLGH should coordinate with related organizations to secure the necessary budget and facilitate the appropriate personnel for the Project.
- (ii) LCC should assist community-based organizations to settle the various problems and issues concerned with the Project implementation and O&M.
- (iii) The RDC and Water Supply Management Board should lead the residents involved to consensus in terms of necessity of safe water supply systems and water charges.

Basic Design Study Report
on
Living Environmental Improvement Project for
Unplanned Urban Settlements in Lusaka
in
the Republic of Zambia

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