

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR CONSTRUCTION
OF
BASIC SCHOOLS IN LUSAKA DISTRICT
IN
THE REPUBLIC OF ZAMBIA**

FEBRUARY 2003

JAPAN INTERNATIONAL COOPERATION AGENCY

DAIKEN SEKKEI, INC.

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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 the Project for Construction of Basic Schools in Lusaka District and entrusted the study to the Japan International Cooperation Agency (JICA).

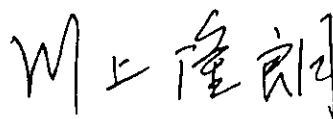
JICA sent to Zambia a study team from May 27th to October 4th, 2002.

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.

February 2003



Takao Kawakami
President
Japan International Cooperation Agency

February, 2003

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Construction of Basic Schools in Lusaka District in the Republic of Zambia.

This study was conducted by DAIKEN SEKKEI, INC., under a contract to JICA, during the period from May, 2002 to February, 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.

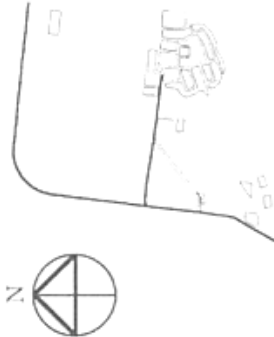
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



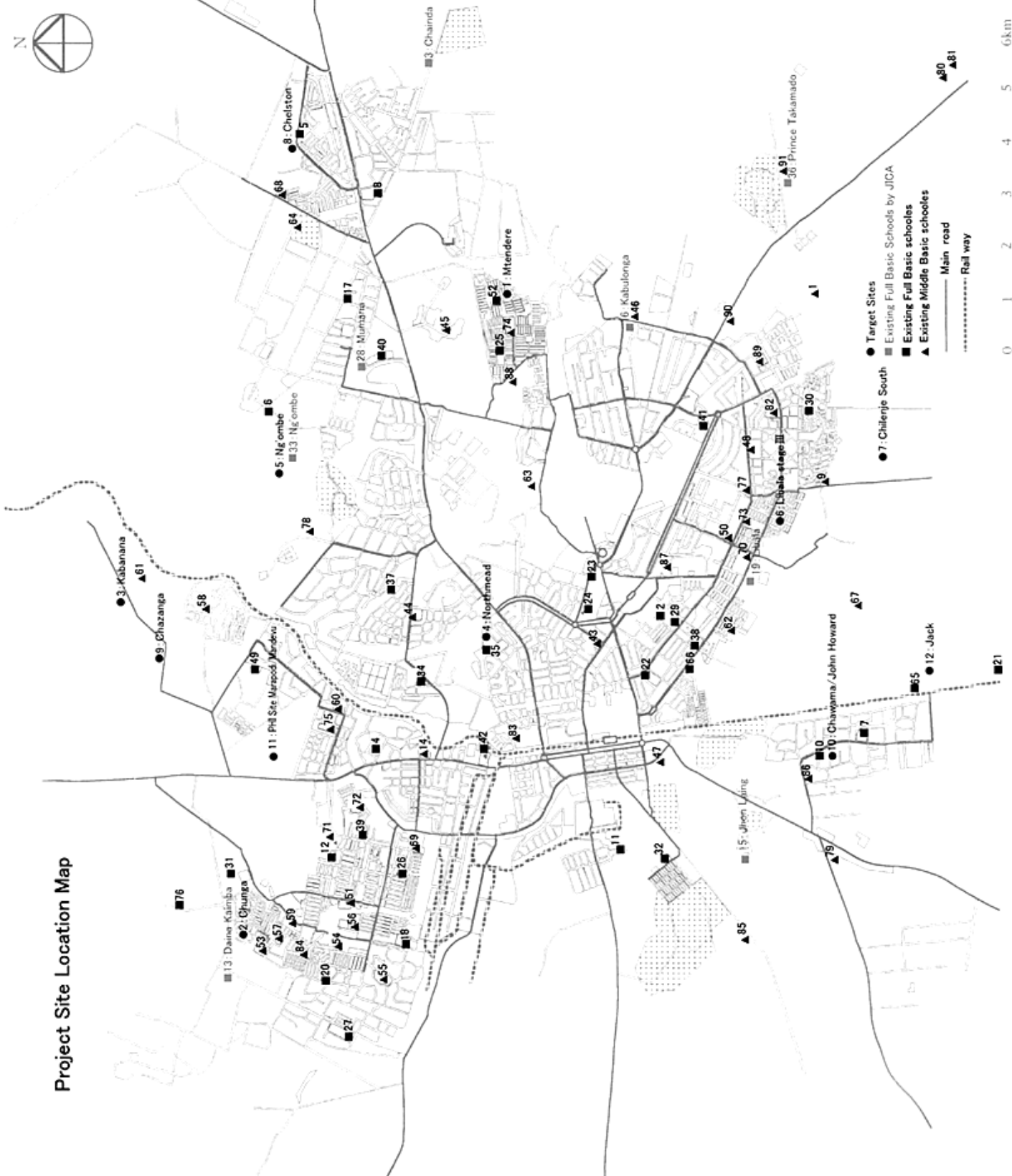
Toshihiko Suzuki
Project Manager,
Basic design study team on
the Project for Construction of
Basic Schools in Lusaka District
DAIKEN SEKKEI, INC.

Project Site Location Map

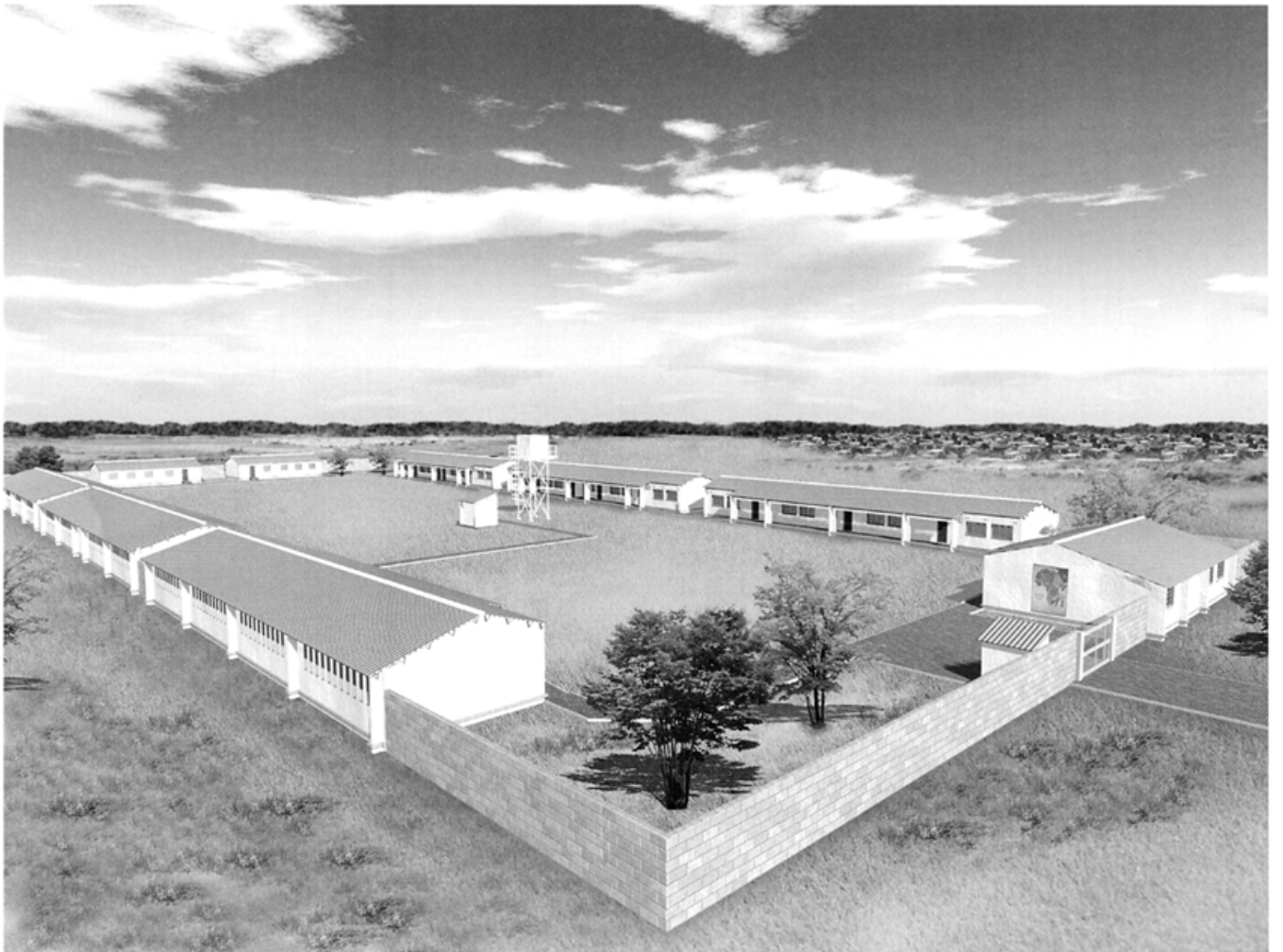


- Target Sites**
- 1: Mtendere
 - 2: Chunga
 - 3: Kabanana
 - 4: Northmead
 - 5: Ng'ombe
 - 6: Libala stage III
 - 7: Chilenje South
 - 8: Chelston
 - 9: Chazanga
 - 10: Chawama/John Howard
 - 11: Pili Site Maroodi Mandeni
 - 12: Jack

- Existing Basic Schools**
- 1: Arthur Vina Basic
 - 2: Burma Road Basic
 - 3: Chaimda Basic
 - 4: Chaisa Basic
 - 5: Chakunkula Basic
 - 6: Chamba Valley Basic
 - 7: Chawama Basic
 - 8: Chelston Basic
 - 9: Challenge Basic
 - 10: Chimwewe Basic
 - 11: Chinika Basic
 - 12: Chingwele Basic
 - 13: Daina Kamba Basic
 - 14: Ermassdale Basic
 - 15: John Lang Basic
 - 16: Kabulonea Basic
 - 17: Kaunda Square Basic
 - 18: Kizito Basic
 - 19: Libala Basic
 - 20: Lilanda Basic
 - 21: Lilayi Basic
 - 22: Lotus Basic
 - 23: Lusaka Boys Basic
 - 24: Lusaka Girls Basic
 - 25: Mahtma Gandhi Basic
 - 26: Matero Boys Basic
 - 27: Muchinga Basic
 - 28: Mumasa Basic
 - 29: Mumuni Basic
 - 30: Muyooma Basic
 - 31: Namando Basic
 - 32: New Kanyama Basic
 - 33: Ng'ombe Basic
 - 34: Newelele Basic
 - 35: Northmead Basic
 - 36: Prince Takamado Basic
 - 37: S.M Kapwepwe Basic
 - 38: St Patrick's Basic
 - 39: St Monica's Basic
 - 40: Tundoya Basic
 - 41: Woodlands 'A' Basic
 - 42: Yotamu Muleya Basic
 - 43: Jacaranda Basic
 - 44: Olympia Basic
 - 45: Chaimana
 - 46: Chidelo
- 2002 data**
- 47: Chibolya
 - 48: Challenge 'B'
 - 49: Chipata
 - 50: Chisengalumbwe
 - 51: Chitanda
 - 52: Chitukuko
 - 53: Chunga
 - 54: Desai
 - 55: George Central
 - 56: Edom Mulongoti
 - 57: HM Mulumula
 - 58: Hillland
 - 59: Hillside
 - 60: Justin Kabwe
 - 61: Kabanana
 - 62: Kabwata
 - 63: Kalingalanga
 - 64: Kamanga
 - 65: Kamulanga Basic
 - 66: Kamwala
 - 67: Kamwala South Basic
 - 68: Kapwelyomba
 - 69: Kasamba
 - 70: Lusakaza
 - 71: Mumbilina
 - 72: Matero East
 - 73: Mwandawere
 - 74: Mtendere
 - 75: Mutambile
 - 76: Nelson Mandela
 - 77: Regiment
 - 78: Roma Girls
 - 79: St Francis
 - 80: State Lodge 'A'
 - 81: State Lodge 'B'
 - 82: T Mwanahatwe
 - 83: Thornpark
 - 84: Twalumba
 - 85: Twashuka
 - 86: Twatasha
 - 87: UTH
 - 88: Vera Chiluba
 - 89: Woodlands 'B'
 - 90: Nyumba Yanga
 - 91: Bauleni



- Legend**
- Target Sites
 - Existing Full Basic Schools by JICA
 - Existing Full Basic schools
 - ▲ Existing Middle Basic schools
 - Main road
 - Rail way



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Abbreviations

AfDB	African Development Bank
APU	Academic Production Unit
ASIP	Agricultural Sector Investment Programme
BESP	Basic Education Support Programme
BESSIP	Basic Education Sub-Sector Investment Programme
CDC	Curriculum Development Centre
CHANGES	Communities Supporting Health HIV/AIDS, Nutrition and Gender Education in School
DANIDA	Danish International Development Agency
DEO	District Education Office
DFID	Department for International Development
ESIP	Integrated Education Sector Investment Programme
ESSP	Education Sector Support Programme
FINNIDA	Finish International Development Agency
GDP	Gross Domestic Product
IDA	International Development Association of the World Bank
HIPC	Highly Indebted Poor Country
LWSC	Lusaka Water and Sewerage Company
MMD	Movement for Multi-Party Democracy
MOE	Ministry of Education
MOFED	Ministry of Finance and Economic Development
MOFNP	Ministry of Finance and National Planning
MPP	Micro Project Programme
MPU	Micro Project Unit
NGO	Non-Governmental Organization
NISTICOL	National In-service Teachers College
OPEC	Organization of Petroleum Exporting Countries
OPSUP	OPEC Primary Schools Upgrading Project
PAGE	Programme for the Advancement of Girls Education
PEO	Provincial Education Office
PIP	Public Investment Programme
PRSP	Poverty Reduction Strategy Paper
SIP	Sector Investment Programme
SRP	Social Recovery Project
TOS	Teaching Service Commission
TSSIP	Training Sub-Sector Investment Programme
UNICEF	United Nations Children's Fund
UNIP	United National Independence Party
USAID	US Agency for International Development
ZAMSIF	Zambia School Investment Fund
ZERP	Zambia Education Rehabilitation Project
ZESCO	Zambia Electric Supply Company

SUMMARY

Summary

The Republic of Zambia (formerly the British protectorate of Rhodesia) was born in 1964 as Africa's 36th independent nation. Immediately following independence, the new nation had abundant national finances due to its economic base of copper exports. However, a drop in the international price for copper and the occurrence of droughts, etc., caused a rapid reversal of its national finances. Beginning in 1989, the country accepted an economic restructuring plan based on agreements with the IMF and the World Bank. However, the situation remains much the same, and the country faces numerous problems that include an increasing national debt, inflation, increasing unemployment, worsening public order, high infant mortality and the spread of AIDS. The Zambian government is working on a programme of national reconstruction to resolve these problems, with improving basic education as one of its key measures.

The Zambian education policy entitled "Educating Our Future (1996)" and the "Basic Education Sub-sector Investment Programme (BESSIP)" established in 1998 as the practical embodiment of this policy have the following main policy objectives: to enable all children to enter school at the appropriate age and receive at least seven years of good quality education by 2005 and to enable every pupil who completes Grade 7 to advance to Grades 8 and 9 by 2015. Another objective is the establishment of an educational environment for the above.

Nevertheless, the high rate of population growth (the yearly mean 2.9%: 1990-2000, Central Statistical Office) and the drop in investment in education due to the adverse financial situation have led to a yearly decrease in primary school enrollment. By 2000, the net enrollment ratio had dropped to 65.6% and, while the gross enrollment ratio 77.9%. Particularly in the capital, Lusaka, the inflow of population from regional areas to the metropolitan area has not slowed down, the rate of population increase is 5-6% and gross enrollment ratio is 66.4%, far below the national average of 77.9%. In addition, there are many schools operating on two- or three session routines due to the lack of classrooms.

The Zambian government views this situation as an educational crisis for the country, and it has prioritized resolving the shortage of educational facilities in Lusaka and is working to construct school facilities with financial assistance from the World Bank and other donors. From 1999 to 2000, Japan also implemented a grant aid project entitled "Project for Construction of Basic Schools in Lusaka District in the Republic of Zambia." This project provided assistance for the construction of 181 classrooms (including special classrooms), administration blocks, caretaker's houses, lavatories and water supply/drainage facilities in 8 new schools in Lusaka, as well as the providing of equipment, in an effort to contribute to human development efforts in Zambia.

Nevertheless, the unceasing population growth in urban areas has made it impossible for classroom expansion to keep up with increased demand, adversely affecting the teaching environment. Faced with this situation, the Zambian government has made a request for Japan's grant aid under a plan to construct

20 basic schools in three cities: Lusaka in Lusaka Province and two cities in Copperbelt Province (Ndola and Kitwe).

In response, the Japanese government decided to conduct a basic design study, and the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study team to Zambia for the period from May 26 to July 3, 2002. This study team held discussions with representatives of the Ministry of Education and other relevant Zambian government officials, and conducted a site survey based on the ultimately confirmed request. In this survey, to establish a policy of reducing construction costs through the active use of local contractors, a trial construction was executed by a Japanese contractor and the local contractors so that the construction capabilities, etc, between the Japanese contractor and the local contractors can be compared. Moreover, to confirm the status of the implementation of trial construction, a second field study was conducted from September 22 through October 7, 2002.

After the survey team returned to Japan, the results of the site survey were compiled in the form of a Draft Report outlining the feasibility of the plan, the organization for project implementation, the organization for maintenance and management on the Zambia side, the establishment of the content and scale of facilities and the selection of equipment suitable for the grant aid. From December 15 through 28, 2002, on-site meetings were held to explain the aforementioned study report and the additional study needed for the detail design was done. The study team compiled the detail design and the specifications for equipment based on this study and the results of the additional surveys. From February 2 through 15, 2003, on-site explanations of the Draft Final Report and the Detail Design Documentation were conducted and finally this Basic Design Study Report was prepared.

The scale of the planned number of classrooms and other facilities and equipment at the target sites was analyzed based on the number of pupils in the results of the study, the scale of existing schools in the region and so on, and the quantities needed at each site were assessed based on the following policies. The initial request was to construct schools at 20 sites. However, because project scale would become too large, it was decided to limit the construction to 12 sites in Lusaka District, where population inflow is increasing, and giving it high priority, which was explained to the Ministry of Education, and a basic understanding was reached.

- (1) The number of children not yet enrolled in Grade 1 was estimated based on interview surveys conducted at the existing 50 basic schools within an about 2 km radius of the target sites, as well as interview surveys regarding the number of children not in school, the population, etc., with the residents who lived around the site. The number of pupils overpopulated at existing schools (Grades 2-7) was estimated based on the number of pupils and classrooms in Lusaka District in 2002 obtained from the District Education Office. For Grades 8 and 9, number of pupils was decided to the advancement rate in Lusaka District. However, for Grade 9, the average session routine was about 1.0 in existing schools, the transfer from the existing schools was not taken into account. There would be no G9 classes in the first year, but the pupils who entered Grade 8 a year before would be enrolled in new schools from the second year onward. It was confirmed that

there was sufficient demand for basic school construction at each of the sites, and all of the sites were included in the plan.

In setting the size of classes and classrooms for the planned schools, considering the population increase ratio, the Ministry of Education criteria (maximum number of classes for school administration = 47, average pupil population per school in the region = approximately 1800) were used as the upper limit for school size to set the moderate number of regular classrooms needed, based on the existing school year configuration and number of teaching session routine at existing schools.

	Number of Pupils	Number of Classes	Number of Classrooms
Grades 1 – 7	1400 (200)	35 (5)	17
Grades 8,9	240 (120)	6 (3)	6
Total	1640	41	23

Note: () shows the Number of Pupils and Number of Classes per each Grade

- (2) Special classrooms were established as follows: based on the results of a survey on current curriculum, achievements at neighboring schools, number of professional teachers and other factors, it was planned to provide regular classroom with auxiliary facilities, such as a storeroom, that can be converted to environmental science room and industrial art rooms in the future.
- (3) As for the administration block and the office room, after confirming from the fact that they were executed at almost all the neighboring schools, the adequate scale of facility were planned by taking into consideration of the constituent of teachers, the number of classes, and the number of teachers.
- (4) One lavatory block each for male and female were planned, with both water borne toilets and pit latrines considering economy. In order to conserve water, the number of stalls was minimized based on Zambian government criteria and the criteria for school environment hygiene in Japan.
- (5) A guardhouse was established by taking into account the fact that almost all schools employ security guards to prevent vandalism.
- (6) Two of the sites could access the municipal water supply, but the other target sites were outside the supply area of the LWSC (Lusaka Water and Sewerage Company). Accordingly, it was decided to dig 40-130 meter bore hole and supply water to the water borne toilets, faucets, and home economics rooms.
- (7) All school buildings were decided to be single-storied because the site area is sufficiently large.
- (8) The results of the trial construction proved that local contractors have satisfactory capability of executing construction by the conventional construction method, if we are not concerned about their management capabilities, such as scheduling and safety control. So, as regards facility specifications, the local conventional construction method which is most economical, efficient, and easily maintained will be adopted.

- (9) The minimum number of classroom furniture (desks and chairs for regular classrooms and home economics rooms) and the furniture for administration blocks will be provided.
- (10) The minimum number of equipment for use in regular classrooms (try square, compass, and others) and home economics rooms (sewing machine, refrigerator, and others) will be provided.

A summary of the plan compiled as noted above is shown below.

(1) Facilities

1) Scale of facilities

Site	Regular Classrooms	Home Economics Rooms	Administration Blocks	Offices	Library	Lavatories	Guard-houses	Total area	Water supply	Borehole
Mutendere	23	1	1	1	1	2	1	2004.93	0	1
Chunga	23	1	1	1	1	2	1	2004.93	0	1
Kabanana	23	1	1	1	1	2	1	2004.93	0	1
Northmead	23	1	1	1	1	2	1	2004.93	1	0
Ng'ombe	23	1	1	1	1	2	1	2004.93	0	1
Libala Stage III	23	1	1	1	1	2	1	2004.93	1	0
Chilenje South	23	1	1	1	1	2	1	2004.93	0	1
Chelstone	23	1	1	1	1	2	1	2004.93	0	1
Chazanga	23	1	1	1	1	2	1	2004.93	0	1
Chawama/John Howard	23	1	1	1	1	2	1	2004.93	0	1
Marapodi/Mandevu	23	1	1	1	1	2	1	2004.93	0	1
Jack	23	1	1	1	1	2	1	2004.93	0	1
Total	276	12	12	12	12	24	12	24,059.16	2	10

2) Specifications

- Foundation: Load-bearing foundation (allowable bearing capacity of soil: 100 kN/m²)
- Floor slab: Slab on grade concrete
- Structural type: Concrete block masonry
- Roof: Reinforcing bar truss (spider truss), corrugated cement sheet (non-asbestos)
- Finish: (Wall) mortar finished with a steel trowel and paint
(Reinforcing bar truss) paint

(2) Furniture

Item	Description (per room or building)
Regular classrooms	2-seater pupil's desk and chairs (20), teacher's desk and chair (1)
Home economics rooms	Pupils tables (10), pupils chairs (20), teachers desk and chair (1)
Administration block	Head teacher and deputy head teacher's desk and chair (1 each), secretary's desk and chair (1), teacher's tables (8), teacher's chairs (30), lockers (2), cabinets (2)
Offices	Teacher's tables (2), teacher's chairs (12)
Library	Teacher's table and chair (1), bookshelves (10)

(3) Equipment

Item	Description (per room)
Regular classrooms	Triangle for writing board use (1), try square (1), straightedge (1), compass (1), protractor (1)
Home economics room	Refrigerator (1), irons (3), pedal-operated sewing machines (3), stoves with ovens (3)

This plan will require three months until public tender and 26 months for construction work, a total of around 29 months for the entire process.

The implementation of this project is expected to yield the following efficacy:

(1) Expansion of opportunities for school education

The construction of 12 new basic schools in the target Lusaka district will enable admission of approximately 4,000 new pupils every year (2,400 for Grade 1 and 1440 for Grade 8) from 2006.

(2) Elimination of classroom insufficiencies and overcrowding

Of the pupil overpopulation of 27,946 that has resulted from insufficient facilities, 14,400 (in grades 2-7) can be transferred to the new schools. This will reduce the number of session routines in basic schools from the current average of 2.26 to 2.02 in 2006, and will improve the learning environment.

(3) Promotion of advancement to compulsory Grades 8 and 9

The lack of school facilities allowed only 14,117 that is about half of Grade 7 graduates (as of 2002) to advance to Grade 8. After completion of this project, it is expected that additional 1,440 Grade 7 pupils who graduate per year will be promoted to advance to Grade 8.

(4) Assistance for enabling self-sufficiency after graduation

With regard to the goal of teaching pupils the basic technologies that will enable them to acquire the basic competence required to be productive members of society by the end of the basic education programme, the construction of home economics rooms will increase the number of schools equipped with such rooms from the current level of 78% to 82%. This will provide children with increased opportunities for learning and help them to become productive members of the society after graduation.

(5) Providing of benefits to the local community

Traditionally in Zambia, local community members have been actively engaged in school administration. Providing classrooms with electric light fixtures will enable literacy classes, etc., for adults to be held during after-school hours, as well as community activities, etc., thus providing a place for local community activities and providing increased opportunities for a variety of activities.

As noted above, this project is expected to provide many benefits. At the same time, improving the educational facilities at basic schools in Lusaka District will help improve the education environment for

citizens in the community widely. Accordingly, this project has been judged suitable for implementation as a Japan grant aid project.

The administration and maintenance by the Zambia side after the implementation of the project, is judged to be sustainable from the personnel, technical, and budgetary standpoints. However, to ensure that the project is implemented as effectively as possible, the following items should be implemented.

- (1) There should be no delay in the site preparation, improvement of access roads, and the providing of access to electricity and water supplies, all of which are the responsibility of the Zambia side. In addition, the Zambian government should ensure that fences and gates are constructed.
- (2) By the time the new schools open, a head teacher and a suitable number of teachers should be employed without delay, and should promote the transfer of excess pupils at existing schools to the new schools (in grades 2-7).
- (3) By the time the new schools open, appropriate arrangements should be made, such as distribution of textbooks and preparation of teaching equipment.
- (4) After the schools have opened, PTAs should be organized and suitable administration and maintenance conducted, and measures should be taken to prevent vandalism by employing security guards and so on.
- (5) With regard to the long-term goal of enabling all Grade 7 graduates to advance to Grades 8 and 9 by 2015, this project is only the first step. More basic education facilities should be built and expanded, and new construction plans should be implemented in order to achieve this goal.
- (6) In addition to improvements to facilities, upgrading the educational content and appropriate assignment and training of teachers are also necessary. Teacher retraining, curriculum development and other educational side improvements should also be actively and autonomously conducted.
- (7) Efforts should be made to determine the school-age population by establishing population statistics, to establish facility construction plans based on the values set for school districts, and to deploy school facilities in an appropriate manner.

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Letter of Transmittal

Project Site Map/Perspective

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