

APPENDIX 3

List of Persons Contacted

List of Personal Met with the Study Team (Basic Design Study)

OFFICE OF PRIME MINISTER

Prime Minister	Gen M. N. MASHEKE
Permanent Secretary	Dr. C. M. FUNDANGA

MINISTRY OF AGRICULTURE

Permanent Secretary	Mr. N. MUMBA
Assistant Director Of Agriculture	Mrs. R. K. CHUNGU
Chief Irrigation Engineer	Mr. A. C. CHIPELEME
Chief Land Use Planning Officer	Mr. I. M. AKAYOMBOKW

DEPARTMENT OF RESETTLEMENT

Special Advisor	Mr. F. BULAWAJO
Permanent Secretary	Mr. P. J. DAKA
Director	Mr. R. S. MWANZA
Deputy Director	Mr. D. SIKAZWE
Coordinator Youth Resettlement	Mr. J. F. MULAMPU
Manager Construction Resettlement	Mr. R. C. SCHULTZ
Carto Grapher	Mr. B. JERE

KANAKANTAPA SETTLEMENT OFFICE

Center Administrator	Mr. J. E. MSONI
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MINISTRY OF WATER, LADS AND NATURAL RESOURCES

Director of Watwe Affairs	Mr. L. L. MBUMWAB
Deputy Director of Meteorological Dept.	Mr. S. MWANGALA
Deputy Director of Hydrological Branch	Mes E. M. MWELWA

MINISTRY OF WORK SUPPLY

Assistant Engineer of Road Dept.	Mr. S. F. DAKA
Chief Engineer of Building Dept.	Mr. V. M. MOOYA

LUSAKA PROVINCIAL OFFICE

Land Use Planning Officer	Mr. R. K. SHULA
Political Secretary	Mr. CHIKONDE M. C.
Extention Worker	Mr. MAKALU S. W.

NATIONA IRRIGATION RESEARCH STATION, MAZABUKA

Irrigation Engineer	Mr. J. B. SIAKANTU
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Embassy of Japan

First Secretary

Mr. T Uenisi

Secondary Secretary

Mr. K Turida

Secondary Secretary

Mr. S Ueda

Third Secretary

Mr. N Yosikawa

Lusaka JICA Office

Director

Mr. K Tomita

Mr. S Miyosi

Mr. S Nabeya

Japanese Expert

Mr. T Tokiya

Japanese Expert

Mr. N Morita

List of Personal Met With the Study Team (Draft Final Report Explanation)

OFFICE OF PRIME MINISTER

Prime Minister	Gen M. N. MASHEKE
Permanent Secretary	Dr. C. M. FUNDANGA

MINISTRY OF AGRICULTURE

Director of Agricultural Planning	Mr. F. M. MBEWE
Assistant Director	Mr. A. C. CHIPELEME

N. C. D. P

Director of Economic and Technical cooperation	Mr. M. C. SOKO
Economist of Economic Department	Mr. NGOMALALA

DEPARTMENT OF RESETTLEMENT

Permanent Secretary	Mr. P. J. DAKA
Deputy Permanent Secretary	Mr. K. KACHINGA
Director	Mr. R. S. MWANZA
Coordinator Youth Resettlement	Mr. J. F. MUAMFU
Manager Construction Resettlement	Mr. R. C. SCHULTZ

KANAKANNTAPA SETTLEMENT OFFICE

Center Administrator	Mr. J. E. MSONI
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MINISTRY OF WATER , LAND AND NATURAL RESOURCES

Director of Water Affairs	Mr. L. L. MBUMWAE
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JAPAN EMBASSY

Japanese Ambassador in ZAMBIA	Mr. Y. SUGIURA
Councillor	Mr. K. OTA
Secondary Secretary	Mr. K. EDA
Secondary Secretary	Mr. K. TURIDA
Third Secretary	Mr. T. UEDA

LUSAKA JICA OFFICE

	Mr. K. TOMITA
	Mr. S. MIYOSI
	Mr. S. NABEYA
Japanese Expert	Mr. T. TOKIYA

APPENDIX 4

Minutes of Discussion





MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE NEW AGRICULTURAL VILLAGE DEVELOPMENT PROJECT
IN
KANAKANTAPA AREA, LUSAKA PROVINCE

In response to the request of the Government of the Republic of Zambia, and based on the results of the Preliminary Study on the New Agricultural Village Development Project in Kanakantapa Area, Lusaka Province (hereinafter referred to as "the Project"), the Japan International Cooperation Agency (JICA) decided to implement the Basic Design Study and sent the study team, headed by Mr. Yasuo SAKAGUCHI, Deputy Director, Chikugogawakaryu Irrigation Office, Kyushu Agricultural Administration Bureau, Ministry of Agriculture, Forestry and Fisheries, to the Government of the Republic of Zambia, from February 13th to March 18th, 1991.

The team had a series of discussions with the authorities concerned of the Government of the Republic of Zambia and conducted a field survey in the project sites. As a result of the discussions and field survey, both parties confirmed the main items described on the attached sheets. The team will proceed with the works and prepare the Basic Design Study Report.

Lusaka, March 14th, 1991


Mr. Yasuo SAKAGUCHI, Leader
Basic Design Study Team, JICA


Mr. P.J. DAKA, Permanent Secretary
Department of Resettlement, C.O.



ATTACHMENT

1. Objective

The objective of the Project is to establish a new agricultural village in the Kanakantapa Area in Lusaka Province for resettling the unemployed youth. The Project will entail land clearing, construction of roads, small scale irrigation system and provision of other necessary facilities.

2. Project sites

The Project site is located in the Kanakantapa Area in Lusaka Rural District in Lusaka province as shown in Annex 1.

3. Responsible organization, executing organization

- (1) Responsible organization: Office of the Prime Minister
- (2) Executing organization: Department of Resettlement

4. Necessary items for the realization of the project requested by the Government of the Republic of Zambia

The basic Design Study Team will convey the desire of the Government of the Republic of Zambia to the Government of Japan that the latter will take the necessary measures to provide the items mentioned below in order to assist in the realization of the project;

- (1) Improvement of the main road
- (2) Construction of small irrigation system
- (3) Provision of construction and farming equipment

However, the final items of the Project may differ from the above items, if it is found necessary after further studies in Japan.

5. Grant Aid system extended by the Government of Japan

- (1) The Government of the Republic of Zambia has understood the system of Japanese Grant Aid explained by the Team.
- (2) The Government of the Republic of Zambia will take necessary measures, described in Annex II for smooth implementation of the Project, on condition that the Grant Aid Assistance by the Government of Japan is extended to the project.

6. Schedule of the Study

- (1) JICA will prepare a draft report in English and dispatch a mission in order to explain its contents around May, 1991.



- (2) After the contents of the report have been accepted in principle by the Zambian side, JICA will complete a final report and send it to the Government of the Republic of Zambia by July, 1991.

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Annex II

Undertakings by the Government of the Republic of Zambia

1. To secure the sites and water rights for the proposed facilities of the project.
2. To clear, level and reclaim the site prior to commencement of the construction. Designated places will be indicated by the Japanese side at a later stage.
3. To provide facilities for distribution of electricity to the sites which will be pinpointed by the Japanese side at a later stage.
4. To bear commissions to a Japanese foreign exchange bank for banking services based on the Banking Agreement.
5. To ensure the necessary budget and personnel for proper and effective implementation of the Project, including the budget and staff for operation and maintenance of the facilities and equipment provided by the Grant Aid.
6. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment brought for the project at the port of disembarkment.
7. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Zambia with respect to supply of products and services for the Project.
8. To accord Japanese nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into Zambia and stay therein for the performance of their work.
9. To maintain and use properly and effectively the facilities constructed and equipment purchased under the Grant.
10. To bear all the expenses other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and the installation of the equipment.

MINUTES OF DISCUSSIONS
ON THE
BASIC DESIGN STUDY OF THE
NEW AGRICULTURAL VILLAGE DEVELOPMENT PROJECT
IN KANAKANTAPA AREA, LUSAKA PROVINCE
(CONSULTATION ON THE FINAL DRAFT REPORT)

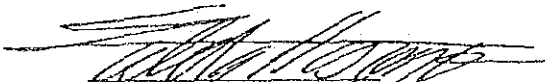
In June 1991, the Japan International Cooperation Agency (hereinafter referred to as JICA) dispatched the Basic Design Study Team on the New Agricultural Village Development Project In Kanakantapa Area, Lusaka Province (hereinafter referred to as the Project) and has prepared the draft report on the basic design study through examining the results of the study in Japan.

In order to explain the components of the draft report to the Government of the Republic of Zambia as well as to consult with the Zambian side on the contents of the report, JICA sent a study team to Zambia headed by Mr. Yutaka HOSONO, Managing Director of Grant Aid Study and Design Department, JICA.

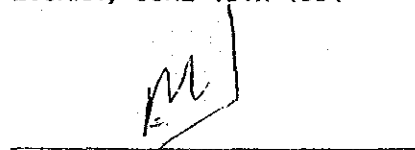
Discussions between the two parties were held from 6th June to 12th June, 1991.

As a result of the discussions, both parties confirmed the main items on the attached sheets.

LUSAKA, JUNE 13TH 1991



MR. YUTAKA HOSONO
LEADER
DRAFT REPORT EXPLANATION TEAM
JICA



MR. P. J. DAKA
PERMANENT SECRETARY
DEPARTMENT OF RESETTLEMENT
CABINET OFFICE

ATTACHEMENT

1. COMPONENTS OF DRAFT FINAL REPORT

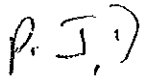
The Government of the Republic of Zambia has agreed and accepted the components of the Draft Final Report submitted and explained by the Team.

2. JAPAN'S GRANT AID SYSTEM

1. The Government of the Republic of Zambia has understood the system of Japanese Grant Aid.
2. The Government of the Republic of Zambia will take the necessary measures described in Annex I for the smooth implementation of the Project on condition that the Grant Aid programme by the Government of Japan is extended to the Project.

3. OPERATION AND MAINTENANCE OF FACILITIES AND EQUIPMENT

The Government of the Republic of Zambia reaffirmed that with regards to operations and maintenance of the facilities and equipment to be provided under the Project as stipulated in Annex I - 4, the Department of Resettlement will allocate budget and staff necessary for proper maintenance of the access road and bridge for the first two years after which this responsibility will be handed over to the relevant government unit (at present Ministry of Works and Supply). The Department of Resettlement will also be responsible for operations and maintenance of the equipment and machinery.



4. WATER RIGHT ON THE CHONGWE RIVER

The Governmeent of the Republic of Zambia reaffirmed that the Department of Resettlement is committed to obtain offical recognition of temporary Water Rights by August, 1991 and a permanent one within one year of the signing of these minutes. The rights are necessary for the construction of the facilities and operation of the Project. The Department of Resettlement will inform the JICA Zambia Office of the acquisition of both water rights.

5. FURTHER SCHEDULE OF THE STUDY

The Team will make a final report and submit it to the Government of the Republic of Zambia by the end of July, 1991.

ANNEX I

UNDERTAKINGS BY THE GOVERNMENT OF THE REPUBLIC OF ZAMBIA

1. To secure the sites and water right for the proposed facilities of the project. The sites are indicated in Annex II.
2. To clear, level and reclaim the site prior to commencement of the construction. Designated places are indicated in Annex III.
3. To provide facilities for distribution of electricity to the sites which are indicated in Annex IV.
4. To ensure necessary budget and personnel described in Annex V by the time when the facilities and equipment will be handed over to the Government of Zambia in order to pave the way for successful and effective implementation of the Project.
5. To utilize the facilities and equipment exclusively in line with the objectives of the Project.
6. To bear commissions to a Japanese foreign exchange bank for banking services based on a banking agreement.
7. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment for the Project at the port of disembarkment.



P. J. J.

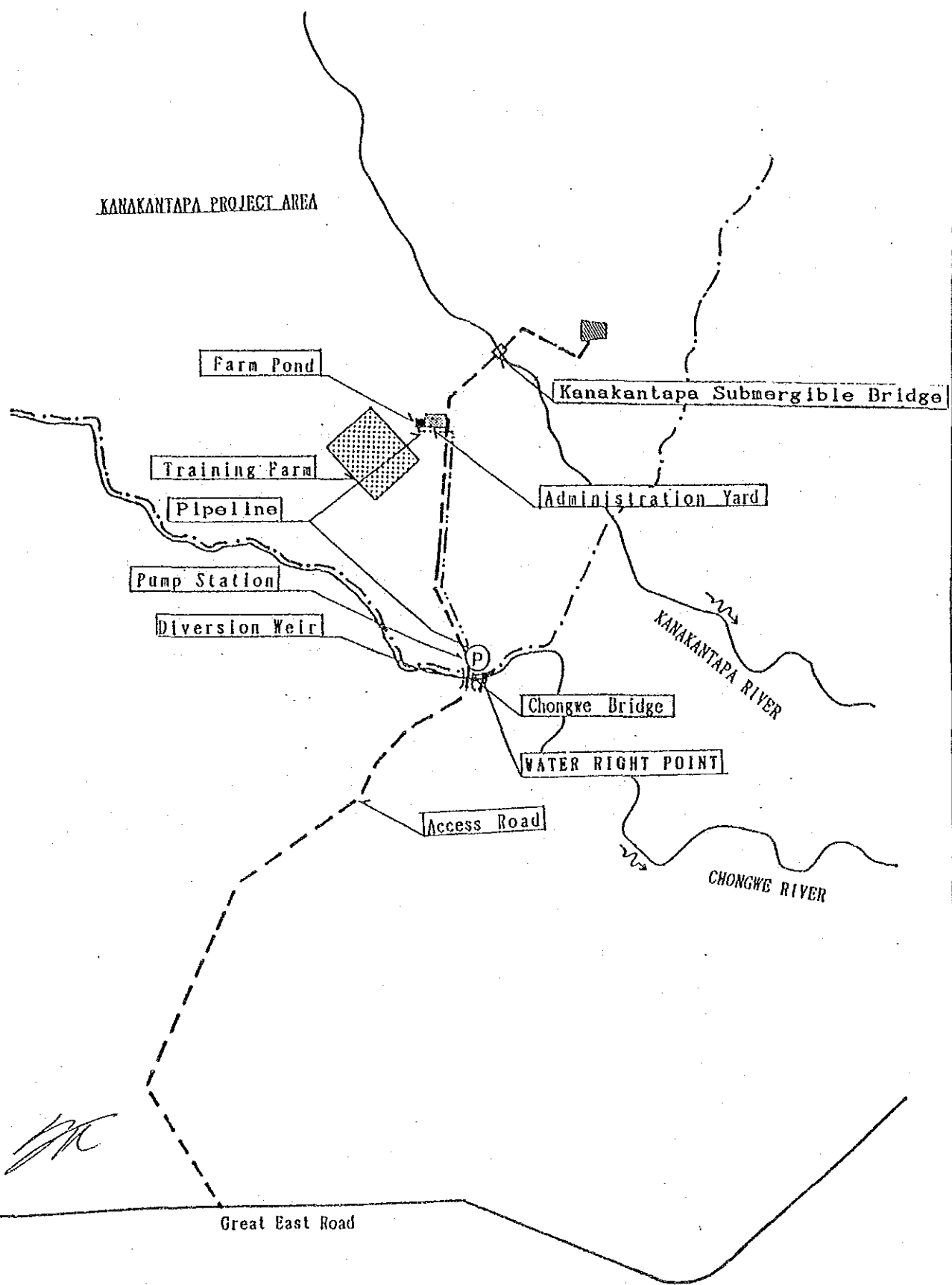
8. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Zambia with respect to supply of products and services for the Project.

9. To accord Japanese nationals whose services may be required in connection with the supply of products and the services under a verified contract such facilities as may be necessary for their entry into Zambia and stay therein for the performance of their work.

10. To bear all necessary expenses other than those to be borne by the Grant, necessary for construction of the facilities as well as for transportation and installation of the equipment.

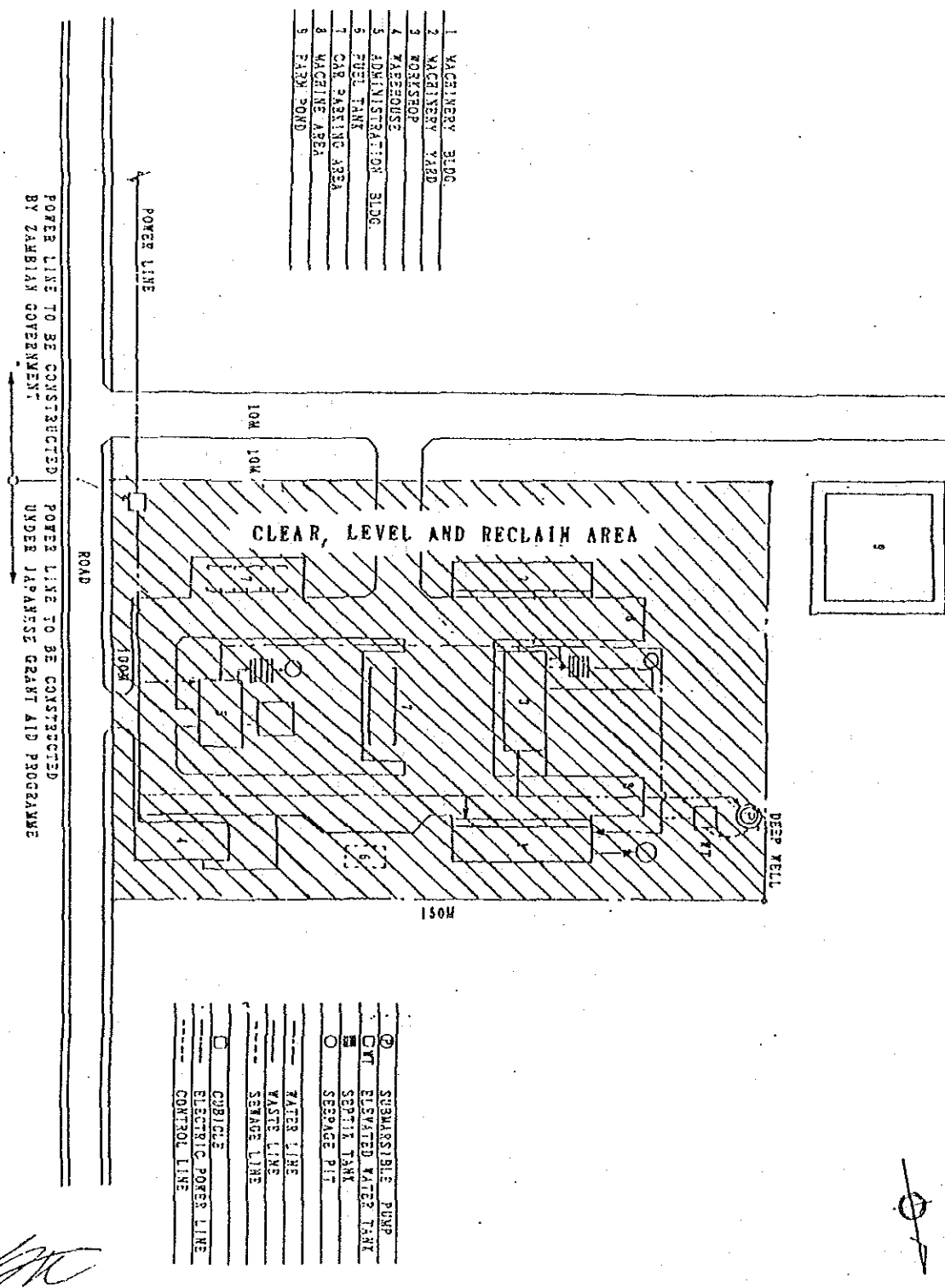
P.J.

ANNEX II



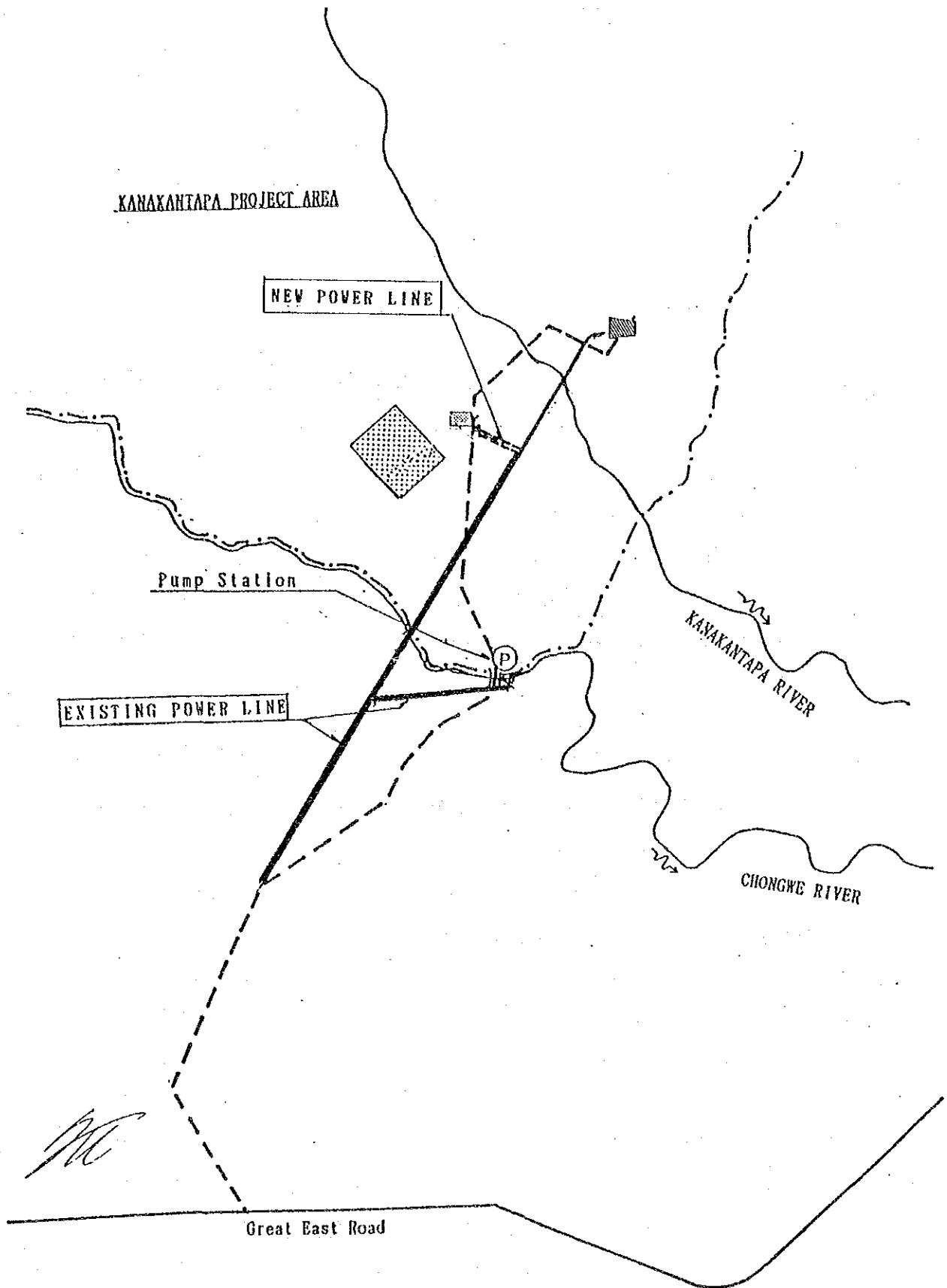
NEW AGRICULTURAL VILLAGE DEVELOPMENT PROJECT

ANNEX III



NEW AGRICULTURAL VILLAGE DEVELOPMENT PROJECT

ANNEX IV



NEW AGRICULTURAL VILLAGE
DEVELOPMENT PROJECT

ANNEX V

(A) Proposed Organisation and Personnel for the Project

DEPARTMENT OF RESETTLEMENT
KANAKANTAPA RESETTLEMENT OFFICE
((Manager...1))

AGRICULTURAL INSTRUCTORS	TRAINING FARM	MACHINERY MANAGEMENT	LANDRECLAMATION
(Instructors..2)	(Manager...1) (Accountant.1) (Agriculture Experts....4) (Drivers....4)	Mechanics.....2)	(Operators..7)

(B) Operation and Maintenance Costs of the project facilities will be covered by the Zambian Government.

(C) Operation and Maintenance costs of Land Reclamation equipment to be covered by the Zambian Government.

APPENDIX 5

Available Information

Available Information

REFERENCES

1	Aerial photograph S ≈ 1/30,000 44 sheets S ≈ 1/20,000 13 sheets	
2	Revised List of Publications 1986/1987 Supplement Government Gazette	Obtainable from the Government Printer Lusaka
3	LAND RESTTLEMENT PROGRAMME of the RETIRED AND UNEMPLOYED WHAT TO DO TO RESETTLE	DEPARTMENT OF RESETTLEMENT DECEMBER, 1989
4	ZAMBIA IN FIGURES 1990	Central Statistifical Office Box 31908 LISAKA
5	Ministry of Lands and Natural Resorces MINISTERIAL STATEMENMT IN PALIAMENT ON 4th AUGUSUT ,1987 ON LAND ALIENATION IN RESERVES AND TRUST LANDS	BEN C. KAKOMPA, MP Minister of Lands and Natural Resources
6	MINISTRY OF LANDS NATURAL RESORCES Procedure on Land Alienation	LAND CIRCULAR No.1 of 1985
7	1990 CENSUS OF POLITION , HOUSING AND AGIRCULUTURE PRELIMINARY REPORT	CENTRAL STATISTICAL OFFICE BOX 31908, LUSAKA , 21 DECEMBER , 1990.
8	MONTHLY DIGEST OF STATISTICS	CENTRAL STATISTICAL OFFICE, LUSAKA January - August, 1990

9	MONTHLY DIGEST OF STATISTICS	CENTRAL STATISTICAL OFFICE, LUSAKA July - December, 1989
10	COUNTRY PROFILE ZAMBIA 1989 / 1990	CENTRAL STATISTICAL OFFICE P. O. BOX 31908 LUSAKA.
11	LAND SETTLEMENT SCHEME INFORMATION BOOKLET	PRINTED BY THE GOVERNMENT PRINTER , LUSAKA
12	STANDARD SPECIFICATAION FOR ROADS AND BRIDGES	ROADS DEPARTMENT, LUSAKA, ZAMBIA December 1973
13	Design Standards	ROADS DEPARTMENT HEAD QUARTERS 26th January , 1988

MAPS

1	Maps	S= 1/50,000	1528A2, -A4, -B1, -B3, 1428C4, -D3
2	RELATIVE HUMIDITY MAP	S= 1/2, 500, 000	Compiled, drawn and published by the office of the Surveyor General, Ministry of Lands and Mines, Lusaka, 1968
3	WIND FREQUENCIES MAP (JAN and JULY)	S= 1/2, 500, 000	Compiled, drawn and published by the office of the Surveyor General, Ministry of Lands and Mines, Lusaka, 1967
4	WIND FREQUENCIES MAP (APRIL and OCT)	S= 1/2, 500, 000	Compiled, drawn and published by the office of the Surveyor General, Ministry of Lands and Mines, Lusaka, 1967
5	RAINFALL MAP	S= 1/2, 500, 000	Compiled, drawn and published by the office of the Surveyor General, Ministry of Lands and Mines, Lusaka, 1968
6	RAINFALL (MEAN ANNUAL RAINFALL) MAP	S= 1/2, 500, 000	Compiled, drawn and published by the office the Surveyor General, Ministry of Lands, Natural Resources Tourism, Lusaka, 1975
7	TEMPERATURE MAP (JURY MEAN TEMPERRATURE) THIS MAP IS BASED ON THE 30 YEAR PERIOD JULY 1950 TO JUNE 1980	S= 1/3, 000, 000	Compiled, drawn and published by the Government of the Republic of Zambia
8	RAINFALL MAP (MEAN ANNUAL RAINFALL) THIS MAP IS BASED ON THE 30 YEAR PERIOD JULY 1950 TO JUNE 1980	S= 1/3, 000, 000	Compiled, drawn and published by the Government of the Republic of Zambia

9	SOIL MAP (Classification of map Units according to F.A.O./UNESCO Soil map of the World Legend)	S= 1/3,000,000	Compiled, drawn and published by the Government of the Republic of Zambia. 1986
10	PROVINCES AND DISTRICTS MAP	S= 1/3,000,000	Compiled, drawn and published by the Government of the Republic of Zambia. 1986
11	REPUBLIC OF ZAMBIA ATLAS SHEET No. 1 AFRICA MAP	S= 1/9,000,000	Published by Surveyor-General, Ministry of Lands and Natural Resources, Republic of Zambia 1988.
12	FOREST ESTATE 1988 MAP	S= 1/1,500,000	Published by Surveyor-General, Ministry of Lands and Natural Resources, Lusaka. 1988
13	REPUBLIC OF ZAMBIA TOURIST MAP	S= 1/1,500,000	Published by Surveyor-General, Ministry of Lands and Natural Resources Lusaka, 1988
14	VEGETATION REFERENCE MAP	S= 1/1,250,000	Compiled, drawn and published by the Surveyor-General Survey Department, Lusaka 1988

METEOROLOGICAL DATA

1	Rainfall	Lusaka Int. Airport Station
2	Maximum Temperature	Lusaka Int. Airport Station
3	Minimum Temperature	Lusaka Int. Airport Station
4	Relative Humidity	Lusaka Int. Airport Station
5	Evaporation	Lusaka Int. Airport Station
6	Windspeed	Lusaka Int. Airport Station

WATER LEVEL DATA

1	Low rainfall	Lusaka Int. Airport , Station Kasisi Mission Chonge , Chalimbana Agri.C
2	Maximum Rainfall after 24 hours	Kasisi Mission
3	Droughly Waterlevel	Chonge
4	Discharge Pattern	Chonge , Kanakantapa
5	High-water level	Chonge , Kanakantapa

APPENDIX 6

Country Data

Information 1

Employment (1000person)

	1980	1984	1985	1986	1987	1988
Agriculture	32.8	35.4	35.1	34.8	36.4	36.8
Minig	62.9	58.5	57.5	56.9	55.8	55.0
Manufacturing industry	47.6	48.2	48.5	48.9	49.9	50.4
Electricity-Warter Supply	8.2	7.8	8.2	8.5	8.5	8.6
Construction	44.4	33.6	29.2	30.7	25.3	23.1
Commerce	31.7	30.2	28.2	28.9	27.9	27.2
Transportation-Communication	24.4	24.0	24.2	24.4	25.4	25.8
Enterprise service	22.5	22.4	22.6	22.6	23.9	24.3
Social,Private service	106.7	105.0	108.0	104.9	108.7	109.5
Total	381.2	365.1	361.5	360.6	361.8	360.7
Total of Labor	2,699.0	3,122.0	3,247.0	3,376.0	3,486.0	3,631.0
Unemployment rate	85.9	88.3	88.9	89.3	89.6	90.1

Source:forth National Development Plan 1989~93 Economic Report 1988

Information 2

Consumer price index(urban Area)

1975=100year average

	1983	1984	1985	1986	1987	1988
High income brackets	278.6	336.4	446.6	707.2	1092.6	1585.0
Variation rate (%)	17.8	20.7%	32.8%	58.4%	54.5%	45.1%
Lower income brackets	311.2	373.5	513.3	778.4	1113.1	1731.7
Variation rate (%)	19.6	20.0%	37.4%	51.6%	43.0%	55.6%

Source:Economic Report 1988 ; Monthly Digest of Statistics.

Information 3

Agricultural Population (1,000person)

Year	Economic Agricultural Sector		Population Actual		Sector (%)
	Total Population	Agricultural Sector	Number	Number	
1970	4189	3209	1465	1122	76.6
1975	4841	3624	1665	1246	74.9
1980	5648	4128	1912	1398	73.1
1985	6666	4731	2242	1591	71
1986	6898	4865	2317	1634	70.5
1987	7139	5003	2395	1678	70.1

Source:Production Yearbook, Vol 41,1987.

Information 4 Producer (ZK)
Price

Unit (kg)	1983/84	1984/85	1985/86	1986/87	19887/88	1988/89	
Crop							
Maize	90	24.50	28.32	55.00	78.00	80.00	108.00
Soybean	90	52.50	60.90	112.10	148.00	217.50	350.00
Sunflower	50	21.50	27.88	41.95	70.00	90.00	200.00
Rice	80	40.00	45.20	55.57	83.00	111.00	168.60
Cotton	1	0.58	0.67	0.99	1.60	3.00	3.60
Groundnut	80	71.50	91.67	131.35	162.00	290.00	336.80
Wheat	90	42.50	45.20	86.40	111.00	190.00	370.00
Tabacco v.	1	2.80	3.25	5.12	6.25	14.00	14.40

Information 5 Agricultural Prod(1,000t)

	1982/83	1983/84	1984/85	1985/86	1986/87
Maize	505.8	531.8	636.2	657.0	1377
Groundnut	0.8	1.0	2.4	1.8	12.6
Tabacco v.	1.9	2.3	2.6	2.9	3.5
Cotton	12.9	31.2	40.9	20.1	63.8
Sunflower	21.3	30.4	25.5	7.3	14.7
Rice	2.8	5.9	5.4	3.7	6
Soybean	5.1	7.0	9.5	2.3	20.2
Sweat potato	1010	1086	1179	1174	1250
Wheat	12.5	10.0	4.4	26.4	28.1

Source: Monthly Digest of Statistics ; Economic Report 1988.

Information 6 Livestock
(1,000head, millions fo feather)

	1979-81	1985	1986	1987
Cow	2238	2690	2770	2850
Pig	217	207	214	221
Sheep	29	75	46	80
Goat	290	395	240	420
Chikin *	18	13	14	14

Source: FAO ; Production Yearbook Vol 41.1987.

Note : * million head

Information 7 Production of Livestock Industry

	1979~81	1985	1986	1987
Total(1,000t)	79	80	81	84
chikin(1,000t)	22	16	16	17
Beaf(1,000t)	29	34	35	36
Ram (t)	1	2	1	2
Pork (t)	7	7	7	7
Milk				
Number of milk cow(1,000 head)	197	242	249	257
Milking (kg)	300	300	300	300
Production of Milk (1,000t)	59	73	75	77
Cheese (t)	710	872	897	923
Butter (t)	199	244	251	259
Egg (t)	27893	30000	30800	31600
Wool (t)
Hide (cow , Bffalo) (t)	3900	4519	4654	4788
Hide (Sheep) (t)	17	45	27	48
Hide (Goat) (t)	191	261	159	277

Source: Production Yearbook, Vol 41, 1987. FAO

Information 8 Market of cattle and production cattle

	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
Cow (1,000 head)	100.0	82.8	99.0	106.5	100.0	85.2
Pork (1,000 head)	37.7	31.1	31.4	30.3	25.1	15.2
Fowl(million feather)	9.8	13.0	20.0	17.0	21.0	...
Egg (million)	113.0	114.0	158.0	169.0	215.0	262.0
Milk (million little)	11.7	15.0	15.9	22.7	18.0	20.0

Source: Ministry of Agriculture, Food and Water Development.

Information 9 Produdetion of Wood (m3)

Year	Log	Fuel Charcol	Woody Board	Veneer board
1976	7966	7539	11	3
1977	8188	7760	12	4
1978	8452	8015	12	4
1979	8722	8275	12	4
1980	8998	8541	12	4
1981	9197	8730	12	4
1982	9502	9023	12	8
1983	9626	9136	12	8
1984	9920	9418	12	9
1985	9933	9418	12	7
1986	9946	9418	12	10
1987	9960	9418	12	10

Source: Trade Yearbook: FAO, 1987.

Information 10

Sum of Import and Export of Agricultural
Forestry and Marine products
US\$ (hundred thousands)

Year	1982	1983	1984	1985	1986	1987
Import	55	108	78	174	289	265
Export	796	680	774	635	474	472

Source: FAO; Trade Yearbook Vol 41, 1987.

Information 11

ZCCM Products and Sales Result

	Unit	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89
Copper							
Product	t	551,021.0	525,811.0	463,354.0	470,982.0	473,084.0	415,645.0
Sale	t	589,356.0	570,115.0	614,461.0	527,645.0	644,641.0	633,568.0
Avg. Price	ZK/t	2,170.0	2,796.0	5,841.0	11,799.0	16,525.0	25,721.0
Cobalt							
Product	t	2,748.0	3,564.0	4,565.0	4,160.0	4,694.0	4,871.0
Sale	t	3,127.0	3,504.0	3,468.0	4,788.0	4,826.0	5,068.0
Avg. Price	ZK/t	18,864.0	45,389.0	90,719.0	80,858.0	108,671.0	130,903.0
Lead							
Product	t	11,369.0	10,294.0	7,684.0	6,793.0	7,554.0	6,345.0
Sale	t	13,345.0	10,386.0	6,950.0	6,513.0	7,626.0	8,371.0
Avg. Price	ZK/t	606.0	857.0	1,829.0	4,434.0	5,496.0	6,056.0
Zinc							
Product	t	33,521.0	29,699.0	21,600.0	22,112.0	20,899.0	18,343.0
Sale	t	38,391.0	30,336.0	19,352.0	22,772.0	21,616.0	20,196.0
Avg. Price	ZK/t	1,101.0	1,810.0	3,172.0	6,029.0	7,014.0	11,289.0
Sales result							
Total Sales							
e. t. c	million zk	1,426.0	1,862.0	4,097.0	6,976.0	11,882.0	18,135.0
Net benefit, Loose	million zk	1.0	0.7	-56.0	-562.0	372.0	18,320.0
Capital expense	million zk	214.8	291.0	1,229.0	870.0	1,097.0	
Blances							
Outstanding account							
Long term loan	million zk	1,017.2	1,484.2	5,078.0	7,855.0	7,314.0	
Repletion loan	million zk	263.0	203.0	203.0	203.0	203.0	
Total property	million zk	2,538.4	4,607.0	17,175.0	25,614.0	19,976.0	23,176.0

Note: ZCCM Annual report

ZCCM: Zambia Consolidated Copper Mines

Information 12

Index of manufacture production 1973=100

	Load	1983	1984	1985	1986	1987	1988
Food, Drink, Tabacco	73	92.7	90.6	89	90.2	95.1	115.7
Cloth	28	167.7	160.7	196.2	162.8	174.6	200.9
Wood product	9	45.3	45.1	52.4	51.5	45.7	37.2
Paper product	12	73.9	78.3	104.4	131.5	204	322.9
Chemical, Gum, Plastic	44	89.8	93	86.2	83.8	78.4	68.1
Nonmetal product	16	107.1	79.9	138	101.2	112.1	83.2
Nonmetal	5	91.5	97.1	93.2	83.7	66.2	41
Metal goods	50	67.7	82.8	95.8	117.1	137.9	91.8
Total products	237	94.5	94.9	103	106.9	112.6	115.6

Source: Monthly digest of Statistics; Economic Report, 1988.

Information 13 Revenue and Reappearance of the Government

	Actual result			Budget Actual Budget result		
	1985	1986	1987	1988	1988	1989
Income	1577	3027	4151	4720	4691	6588
Income profit tax	439	806	974	1838	1777	2015
Goods service tax	621	1024	1668		1889	...
International business tax	348	1020	1364		813	...
Prepresentation	20	173	290	832	832	1332
Total income and Presentation	1577	3200	4441	5552	5523	7920
Ordinary expenses	2012	4751	6178	6350	7204	7481
Salary	532	653	822	1068	1079	...
Other goods service	302	554	1025		1367	...
Assistance	200	581	677	1150	1211	1503
Capital expenses	616		954	1953	1230	2357
Total expenses	2628		7132	8303	8434	9838
Total balances	-1051		-2692	-2751	-2911	-1918
Proportion to GNP	14.9		13.7	9.5	12.9	5
Money market						
International (net)	600		1829	321	352	477
Domestic (net)	451		863	2430	2560	1441

Source: IMF, International Financial Statistics; Budget Speeches

Information 14

Trend of Trade

	1983	1984	1985	1986	1987	1988
Export fob	1052	1184	2451	3743	8058	9791
Import cif	1072	1329	1932	4828	7424	6861
Balances	-20	-145	519	-1085	634	2930

Sources: IMF, International Financial Statistics.

Information 15

Breakdown of Trade (million zk)

Export	1985	1986	1987	Import	1984	1986
Copper	1961	4429	6845	Machien	230	516
Cobalt	276	385	466	Energy	329	466
Zinc	53	99	131	Production	216	419
Lead	7	16	20	Chemical prod.	151	317
Tabacco	4	7	17	Viechles	88	178
				Food, Drink	53	81
				Materials	24	33

Source: Monthly Digest of Statistics; Bank of Zambia, Annual Report.

Information 16 Trading Country

Export	1981	1984	1985	Import	1981	1984	1985
Japan	19.5	23.6	26.0	U.S.A	8.3	6.9	21.4
China	1.0	9.5	11.3	South Africa	15.1	22.8	11.8
U.K.	7.5	5.8	7.3	West German	7.8	5.8	11.6
U.S.A	6.5	10.0	6.8	U.K.	15.6	13.5	6.8
German	4.4	3.6	4.8	Japan	6.0	3.4	5.4

Source: Monthly Digest of Statistics

Information 17 International balances (million dollar)

	1982	1983	1984	1985	1986	1987
Export fob	942	923	893	797	692	847
Import fob	-1004	-711	-612	-571	-518	-585
Trad balances	-61	212	280	226	175	261
Service export	137	102	80	71	48	49
Service import	-612	-575	-478	-667	-502	-460
Transfer to private	-56	-49	-45	-33	-42	-20
Transfer to public	26	39	10	6	22	29
Current account	-566	-271	-153	-398	-300	-141
Direct investment	39	26	17	52		
Other long term investment	111	90	97	321	-143	-241
Short term investment	103	-78	37	4	-105	-28
Capital balances	253	38	151	377	-248	-269
Error	-77	211	-87	-147	444	151
Relative provision	38	37	47	-67	-96	-26
Exceptional maney market	453	-47	-45	321	13	191
Forign debt						
Forign currency reserves	-100	32	87	-85	187	95

Source: IMF, International Financial Statistics.

Information 18

Total official development assistance

	1982	1983	1984	1985	1986	1987
Between two nations	267.8	184.4	183.1	218.0	363.4	345.9
Japan	25.0	19.3	5.0	42.1	55.9	41.7
U.K.	22.5	21.1	20.1	23.9	47.3	40.1
U.S.A	22.0	23.0	40.0	36.0	41.0	34.0
Sweden	27.5	29.4	20.4	22.9	44.4	25.4
Among nations	52.3	33.4	57.8	113.7	115.4	84.7
I D A	8.6	8.2	15.5	66.0	74.0	40.4
EC	30.1	8.4	23.9	29.1	16.3	20.0
Total	320.1	217.9	240.9	331.7	478.9	430.7
Presentation	143.3	149.3	159.2	197.3	292.2	314.0

Source: OECD, Development Assistance Committee, Geographical Distribution of Financial Flows to Developing Countries.

Information 19 Total Outer Debt and Public Outer Debt (year of the end)
million dollar

	1982	1983	1984	1985	1986	1987
Total debt	3705	3784	3847	4641	5625	6400
Long term debt	2423	2604	2716	3203	3782	4354
without public security	2379	2580	2693	3203	3782	4354
without private security	44	25	23			
Use of IMF Trust	635	666	698	762	825	957
Purchase	38	180	151		122	
Re-purchase	95	121	73	99	144	
Short term debt	648	514	433	676	1018	1089
Total debt/GNP	101.9	120.3	151.5	195.2	398.6	334.4
Public debt						
Total	3308	3395	3439	3958	4516	5295
Payment	2379	2580	2693	3203	3782	4354
Public trust	1730	2028	2162	2591	3200	3744
Among nations	521	530	538	770	1020	1261
Between two nations	1209	1497	1624	1821	2180	2483
Private trust	650	552	531	613	582	610
Traders	315	247	205	234	230	253
Money market	335	305	325	378	352	357
Debt service	176	125	114	95	140	129
Proportion debt service	16.3	12.2	11.8	10.9	19.1	13.5
Payment debt/GNP(%)	65.4	82	106	134.7	268	227.5
Proportion of Payment Debt to Transfer Loan (%)	43.8	43.1	40.7	41.5	41.3	42.8
Proportion of Payment Debt to variable interest rate(%)	11.8	11.6	14.6	15.4	15.9	14.7

Source: World Bank, World Debt Tables.

Present Agriculture of The Study Area

(a) Agricultural Production

① Crops

Maize is the predominant crop cultivated in the study area, followed by soybean, sunflower, cotton, and groundnut. The vegetables cultivated in homesteads, include rape, tomato, sweetpotato, cabbage, and pumpkin. The cultivation areas for each village is as follows.

The cultivation in the study area in 1991 ha

Village Crops	A	B	C	D	E	F	G	H	I	J	K	Total
Maize	132	82	71	73	63	80	44	95	11	78	81	810
Soybean	8	8	3	4	-	2	2	7	2	-	-	36
Sunflower	4	-	3	-	1	2	11	4	-	-	-	25
Cotton	2	1	2	-	2	2	4	1	1	-	1	16
Total	146	91	79	77	66	86	61	107	14	78	82	887

Interview conducted in the study area in 1991

② Cropping

The beginning of cultivation generally accords with the beginning of rain, the ending of cultivation also accords with the ending of rain. The ongoing cropping of each crop is as follows.

Ongoing cropping of the study area Rain season

	9	10	11	12	1	2	3	4	5	6	7	8
Maize			○	○	—	—	—	—	—	—	△	△
Soybean				○	○	—	—	—	△	△		
Sunflower				○	○	—	—	—	△	△		
Cotton			○	○	—	—	—	—	△	△	△	
Groundnut			○	○	—	—	—	—	△	△		

○—○ Seeding period ○—△ Growing period
 △—△ Harvesting period

③ Continuous cropping

The cropping pattern in the study area is mostly the continuous cropping of maize.

Ongoing cropping systems are as follows.

<u>Ongoing cropping system</u>				
Type	Cropping system			Coverage percentage
	1988 - 89	1989 - 90	1990 - 91	
I	Maize	Maize	Maize	15 %
II		Maize	Maize	50 %
III			Maize	25 %
IV		Other crops	Maize	5 %
V		Maize	Other crops	5 %

Interview conducted in the study area in 1991

④ Cultivation techniques

Most of the settlers had not experienced farming before being settled. They are presently being taught the practice of maize cultivation by agricultural extension officers since 1989 the first year of settlement. Therefore the settlers use similar agriculture techniques (variety, spacing, fertilizer application etc). When they cultivate cotton, soybean, etc., which they contract to plant with a company, the techniques are taught by the company. The settlers straightforwardly accept new agricultural techniques because of their age and experience.

a. Farming tools

Ploughing is mostly done by hand, sometimes done by hired ox or tractor in the settlement area. Other farming work is always done by hand.

The following are the farming tools of 11 interviewed settlers.

<u>Farming tools of 11 settlers</u>			
Items	Number	Number per one family	
* Hoe	15	1.4	* These tools are offered to settlers by the Department of Resettlement
* Ax	14	1.3	
Shovel	1	0.1	
Slasher	1	0.1	
* Rake	11	1.0	
* Fork	11	1.0	
* Pick	11	1.0	

b. Fertilizer

All of the settlers are using chemical fertilizers that the Department of Resettlement offered for 2 ha fields in 1989. They will buy fertilizers themselves

from next year, so that it is possible to reduce the use of fertilizers because of their costliness.

The type of chemical fertilizers being applied are as follows.

They are not using organic manure.

Amount of chemical fertilizers at the settlement

Crops	Basal	Top dress
Maize	X Compound 200kg	A/N 200kg
Sunflower	D Compound 200kg	-
Cotton	X Compound 100kg	-
Soybean	D Compound 200kg	-

*For the contents of N. P. K. S and trace elements see Fig - .

Interview conducted in the study area in 1991

c. Agro-chemicals

The use of agro-chemicals has not become popular. Settlers use only a little agro-chemicals when cultivating vegetables and cotton.

⑤ Yields

The standard yields of the main crops being raised in this area are as follows, according to the data available at the kanakantapa office.

Crop yields in the study area in 1989-90

Crops	1989年			1990年		
	Cultiva- ted area	Yield	Average yield / ha	Cultiva- ted area	Yield	Average yield / ha
Maize	200 ha	460,350 kg	2,302 kg	500 ha	771,600 kg	1,543 kg
Sunflower	-	-	-	15	6,750 kg	450 kg
Cotton	-	-	-	20	7,200 kg	360 kg
Groundnut	-	-	-	10	6,500 kg	650 kg
Sweetpotato	-	-	-	5	60,000 kg	12,000 kg

(b) Livestock breeding

The income generated from livestock breeding is insignificant. The number of animals by type, are given in the following table.

<u>Present number of animals</u>	
<u>Type of animal</u>	<u>Number of heads</u>
Cattle	0
Goat	140
Poultry	2,500

Interview conducted in the study area in 1991

Goat and poultry are being raised in natural ways, meaning free running.

(c) Marketing of farm products

① the sale of main crops

The settler's households are being offered free food (25kg maize per month) until this year's harvest has been done from the Department of Resettlement. Therefore, the produced maize was mostly sold to the District co-op & Marketing Unions.

Part of the groundnut and sweetpotato crops are used for home-consumption and the rest are sold.

Other farming products are mostly cash crops such as soybean, cotton, and sunflower which are purchased by the marketing board as follows.

AGRICULTURAL MARKETING SERVICES

	<u>Marketing Organization</u>
Maize	District Co-op & Marketing Unions
Sunflower	-do-
Groundnut	-do-
Wheat	-do-
Rice	District Co-op & Marketing Unions
Soybean	The Lint Company of Zambia Limited(LINTCO)
Sorghum	District Co-op & Marketing Unions
Cotton	The Lint Company of Zambia Limited(LINTCO)
Millet	District Co-op & Marketing Unions
Cassava	-do-
Tobacco V	National Tobacco Company Limited(NATCO)

② Price of main crop

Recent changes of official producer prices are as follows.

Official price of crop

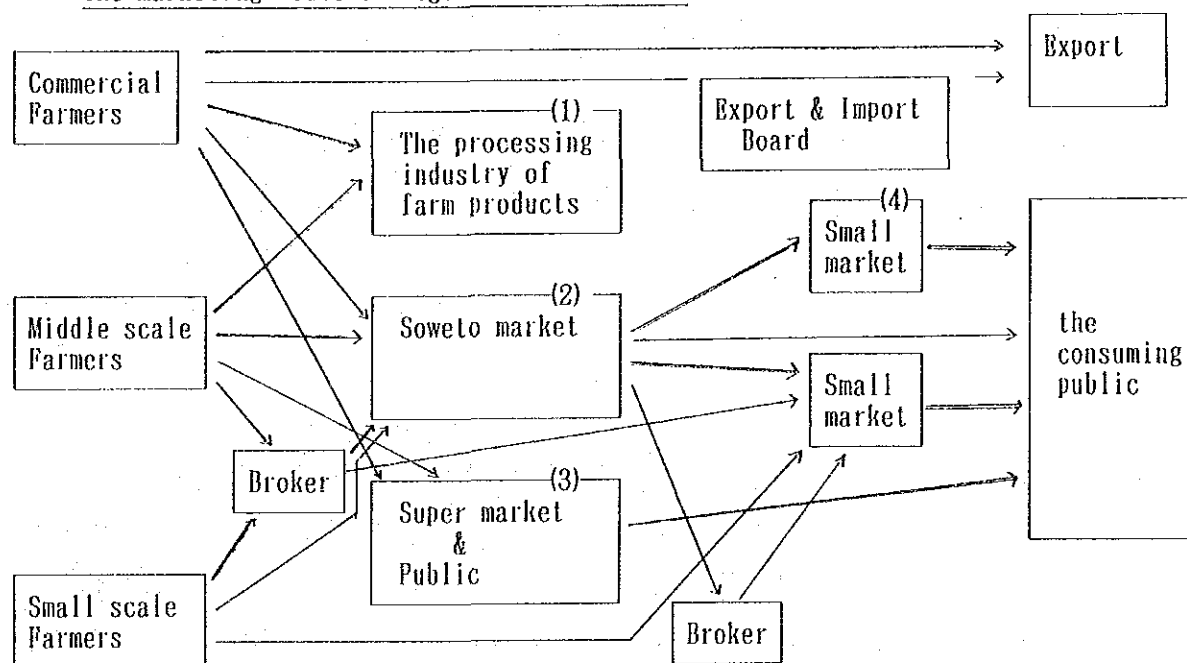
(in Zambia Kwacha)

	Unit	1985	1986	1987	1988	1989	1990	1991
Maize	90kg	28.32	55.00	78.00	80.00	—	284.20	500.00
Sunflower	50kg	27.88	41.95	70.00	90.00	—	300.00	453.24
Groundnut	80kg	91.67	131.35	110.00	290.00	—	630.00	922.37
Wheat	90kg	45.20	60.40	111.00	165.00	—	487.23	683.37
Rice	80kg	40.00	55.57	83.00	111.00	—	369.50	585.52
Soybean	90kg	60.90	112.00	148.00	217.50	—	577.20	801.49
Sorghum	90kg	26.90	42.75	74.00	76.00	—	270.00	475.00
Cotton	1kg	0.67	0.99	1.60	3.00	—	9.70	15.53
Millet	90kg	38.10	56.25	92.00	160.00	—	435.00	700.74
Cassava	1kg	0.30	0.60	0.70	1.00	—	3.20	4.45
Tobacco V	1kg	3.45	5.12	6.25	14.00	—	60.00	87.45
Tobacco B	1kg	2.30	3.50	5.10	9.00	—	48.00	86.00

③ The sale of vegetables

Vegetables are mainly produced for home consumption on homesteads in the settlement. A few vegetables are soled to the Chiongwe market which is the nearest town from Kankantapa. The Kanakantapa area will be close to the Lusaka market after the road will have been suitably constructed. Vegetables will possibly become important crops in this area. Therefore, the marketing route of vegetables and fruit was researched in this study. The official harvesting dates of vegetables and fruit were difficult to acquire from the government. Research was mainly conducted by us.

The marketing route of vegetables and fruits



a. The processing industry of farm products

The main processing industries of farm products in Zambia are Lyons Brooke Bond, Popper Harvest Ltd, Grandma's, Cunquik Botters which are all privately managed and Zambia Horticultural Products Ltd, which has government investment.

These industries buy products from farmers with their contracts and they produce tomato ketchup, sauces and jams(tomato, strawberry, raseberry, mango, guwava).

b. Soweto market

The Soweto market is the discharge center market much like the center market of Japan. Vegetables and fruit which are grown in Lusaka are gathered to this market and bought by marchants. Farmers and brokers bring products to this market by themselves. The price is fixed through the negotiations with farmers and buyers.

c. Supermarkets & the public

The public means schools, hospitals etc. The public and supermarkets buy from specific commercial farms and general farms.

④ The price of vegetables

a. Market prices in Soweto (1991 / 2 / 25)

CROPS	UNIT	PRICE
Tomato	Box (about 18-20 kg)	300 ~ 400 kw
Rape	Bag (about 50 kg)	250
Okra	Bag (about 40 kg)	1,500
Cucumber	Box (about 15 kg)	100
Onion	Bag (about 10 kg)	200
Cabbage	Bag (about 50 kg)	300
Green Beans	Bag (about 40 kg)	200
Sweet Sorghum	40peices×4m	300
Carrot	Bag (about 50 kg)	300
Eggplant	Bag (about 35 kg)	200
Potato	Bag (about 10 kg)	190

• Trading prices change every day. The price of vegetables generally goes up in May and in June.

• There are about 100 ~150 trucks or tractors brought to the market daily. About 30 trucks carry tomato on one day, and 30 trucks can carry 300 boxes or 5.4ton.

• The transport fee is about 50 kw per 1 box or bag for 30-50km . And 2,000 kw per 100 boxes

b. Sales prices in Supermarkets

The sales prices in supermarkets are more expensive than local markets. But the supermarkets have more vegetable and fruit variety than local markets.

(25th Feb. 1991)

CROPS	UNIT	PRICE kw/kg	CROPS	UNIT	PRICE kw/kg
Tomato	1 kg	50.0	Tomato		300 ~ 400
Rape			Rape		250
Okra		21.0	Okra		1,500
Cucumber		56.0	Cucumber		100
Onion		33.6	Onion		200
Cabbage		17.0	Cabbage		300
Green Beans		42.0	Green Beans		200
Sweet Sorghum			Sweet Sorghum		300
Carrot		35.0	Carrot		300
Eggplant			Eggplant		200
Potato		27.0	Potato		190

c. The purchasing price of the processing industry

The purchasing price of the Zambia Horticultural Products Ltd. are as follows.

Dealing crops	Price of 1990	Price of 1991
Tomato	15kw/kg	10kw/kg
Orange	12kw/kg	12kw/kg
Mango	fix with growers	
Pineapple	fix with growers	

* The grower delivers to the factory.

(d) Maize mill

Maize milling units owned by the kanakantapa office are found in the center of the settlement. The milling charge is 80 kw per one basket (about 20kg). This amount is used for oil and the operator payments .

(e) Agriculture materials, material prices and the hire of ox and tractors

① Seed and price

Some of the seeds are self-supplied by the settlers themselves. But most seeds of maize and other cash crops are procured from the marketing board. Vegetable seeds are procured from the merchants.

a. Pre-planting producer prices of the government

TYPE	VARIETY	UNIT	PRICE	
			1989-90	1990-91
Maize	MM 603/604/612	50 kg	593.00 kw	1,043.00 kw
	MM 752		1,137.00	2,063.00
	MM 601		1,563.00	3,038.00
	MM 501/502		1,378.00	2,663.00
	MM 504		762.00	1,148.00
	MM 600	10 kg	88.00	100.00
	MMV 400		162.00	178.00
Soya Beans		60 kg	703.00	758.00
Wheat		50 kg	607.00	993.00
Sunflower	Composite	25 kg	405.00	508.00
Sorghum	Zsvi/Framida	50 kg	451.00	563.00

b. Prices from the Zambia Seed Company Limited
crop

TYPE	VARIETY	UNIT	PRICE	
			Wholesale	Recommended
Maize	MM 603	50 kg	921.00 kw	1,110.00 kw
	MM 604		921.00	1,110.00
	MM 752		1,941.00	2,130.00
	MM 501/2/3		2,541.00	2,730.00
	MM 504		1,026.00	1,215.00
	MM 601		2,916.00	3,105.00
	R 201		921.00	1,110.00
	R 215		921.00	1,110.00
	ZS 225		1,428.00	1,617.00
	ZS 206		1,941.00	2,130.00
	Sunflower	CCA 81	25 kg	424.80
CH 301			992.30	1,124.00
PNR 7442			1,962.30	2,094.00
Soybeans	Hernon 147	25 kg	752.20	825.00
	Magoye	15 kg	400.80	447.00
Groundnut	Makulu red	40 kg	2,276.00	2,414.00
	Chalimbana		2,276.00	2,414.00

• vegetable

TYPE	VARIETY	UNIT	PRICE
Cabbage	Riana F1	1 kg	7,583.00 kw
	Rolan F1		7,583.00
	Brunswick		436.00
	Golden Acre		436.00
	Main Crop		436.00
	Copenhagen Market		436.00
Onion	Granex F1		2,295.00
	Texas Early Grano 502		1,316.00
	Hojem		1,652.00
Rape	Giant		393.00
	Karate		93.00
Tomato	Heinz 1370		1,233.00
	Money Maker		2,241.35
	Monoprecos		800.40
	Rossol VFN		1,120.10

② Price of fertilizers and chemicals

Fertilizers and chemicals are bought from the District Co-op & Marketing Unions of Chiongwé. There are occasional stock shortages.

a. The contents of N.P.K.S and trace elements

Commodity	Nutrients	N %	P ₂ O ₅ %	K ₂ O %	Boron %	Sulphur (Approximate) %
Mixture :						
A		2	18	15	0.1	10
C		6	18	12	0.1	10
V		4	18	15	0.1	10
R		20	20			10
X		20	10	5		10
D		10	20	10		10
Nitrogenous:						
Ammonia Nitrate(N/A)		34				
Sulphate of Ammonia		21				24
Urea		46				
Nitrate of Soda		16				
Phosphate Fert:						
Single Super Phosphate			19			
Triple Super Phosphate			44			
Potash Fertilizers:						
Potassium Chloride				60		
Potassium Sulphate				50		

b. Fertilizer price

• Official price

TYPE	UNIT	PRICE	
		1989-90	1990-91
Compound C	50 kg	374.00 kw	544.00 kw
V		374.00	530.00
R		336.00	563.00
D		396.00	567.00
X		383.00	530.00
Urea		384.00	446.00
Ammonium Nitrate		383.00	434.00
Single Super Phosphate		293.00	580.00
Zinc Sulphate		375.00	1,094.00
Solubor		770.00	2,142.00

c. Chemical price
 • Commercial price

TYPE	UNIT	PRICE
Atrozone	20 l	6,414.00 kw
Furadan	25 kg 1 kg	7,480.00 334.20
Malathion 40%EC	25 l 1/2 l	13,843.75 299.85
Copper Oxychloride	1 kg	150.00

③ Farming tools

Settlers were offered farming tools from the Department of Resettlement. So that, they have not bought any farming tools this year.

• Commercial price

TYPE	UNIT	PRICE
Tractor-4 wheel (MAZEMBE TRACTOR Co)	108 Hp 98 Hp	2,900,000 kw 2,500,000
Hand Tractor (BW TARRI ZAMBIA Lit)	4 Hp	55,400
Wheel Barrow		3,900 ~ 4,400 kw
Plough for Ox		2,644 ~ 3,570
Hoe		225
Fork Jembe		850 ~ 630
Ax		1,975
Shovel		630 ~ 795
Sprayer	20 l	4,800
Rake		250
Slasher		175
Hand-mill		8,304 ~ 26,071
Mill (auto-)		274,500
Ox (calf 1 year)		3,000
(work cattle)		16,000 ~ 18,000

④ Hiler cost

Material for ploughing	Private Fee	Department of resettlement price
Tractor	1,500 ~ 2,000 kw	* 300 ~ 560 kw
Ox	1,500 ~ 3,000 kw	—
Man (per day)	1,500 ~ 2,000 kw (60 ~ 100 kw)	— (60 kw)

* The Department of Resettlement offered some settlers hired tractors at this price, but soon there were shortages of money.

(f) Farm household economy

Eleven settlers were selected from eleven villages, were interviewed for research into the financial conditions of last year for this study. The results from the interview are as follows.

① Number of family

Householder	1	
Others	0.7	(Children 0.35 = babies)
total	1.7	

② Agriculture receipt

	Maize	Rape	Pumpkin leaf
Cultivated area	0.8 ha	0.04 ha	0.01 ha
Yield per ha	1,543 kg	3,000 kg	9,000 kg
Yield	1,234 kg	120 kg	90 kg
Homeconsumption per person	140 kg		
* per family	189 kg		
Selling Products	1,045 kg	120 kg	90 kg
Price per unit	284.2kw/90kg	100kw/50kg	110kw/50kg
Amount of sale	3,300 kw	240 kw	198 kw
Total		3,738 kw	

* not to count children as adults because of babies

③ Farming expenses

	Maize	Rape	Pumpkin leaf
Cultivated area	0.8 ha	0.04 ha	0.01 ha
Seed rate per ha	20 kg	2.6 kg	—
Used seed	16 kg	0.1 kg	—
Price per kg	11.84kw	53 kw	
Fertilizer			
Basal (kg/ha)	200	300	300
Actual amount	160	12	3
Price per kg	7.66kw	7.66kw	7.66kw
Top dress(kg/ha)	200	—	—
Actual amount	160		
Price per kg	7.68kw		
Material cost			
Seed	189 kw	5 kw	
Basal fertilizer	1,226 kw	92 kw	23 kw
Top dress	1,229 kw		
Subtotal	2,644 kw	97 kw	23 kw
Total		2,764 kw	

④ Non-agricultural income

	Charcoal	Local alcohol	Cake
Material cost	--	Maize 71 kw Sugar 96 kw	Floor Sugar 1,516 kw Oil
Subtotal		167 kw	1,516 kw
Output	24 bags	68 l	727 pieces
Selling price	70 kw/bag	7 kw/l	2.5 kw/piece
Amount of sale	1,680 kw	476 kw	1,818 kw
Returns	1,680 kw	309 kw	302 kw
Total		2,291 kw	

⑤ The cost of living

	Consumption per year	Price per unit / 1991	Total kw
Sugar 1.5kg/month	18 kg	37 kw/kg	666
Salt 0.8kg/	9.6 kg	25 kw/kg	240
Soap 3 pieces/	36 pieces	25 kw/piece	900
Edible oil 2 l/	24 l	150 kw/l	3,600
Lamp oil 3 l /	36 l	30 kw/l	1,080
Clothing			1,000
Transport fee	6 times to Lusaka	100 kw	600
Sick	0		0
Education	0		0
Others			1,000
Total			9,086

Inflation showed an annual rate of 175 percent from 1990 to 1991.

Therefore, the cost of living in 1990 is $9,086 \div 1.75 = 5,192$ kw

The income and output settler's farming economy in 1990 is -----

Agriculture receipts are 3,738 kw, and farming expenses are 2,764 kw. The profits from agriculture are merely 974 kw. This small profit is due mainly to a poor harvest of maize in 1990. Non-agriculture income is 2,291 kw. Total income per settler is 3,265 kw.

On the other hand, the cost of living per family is 5,192 kw, so that balance is -1,927 kw.

Income and output settler's economy		
Agriculture receipt		3,738
Farming expenses	-	2,765
<hr/>		
Sub-total profit		974
Non-agriculture income		2,291
The cost of living	-	5,192
<hr/>		
Total	Balance	△ 1,927

The Department of Resettlement offers free food and subsistence to settlers until this year's harvest.

⑥ Incentives (per family)

	Incentive amount per year	Price of unit (1991 - 2)	
Subsistence			
Milmil 25 kg/month	300 kg	500 /kg	1,666.7 kw
Sugar 1 kg/	12 kg	37 /kg	444
Salt 0.6kg/	7.2 kg	25 /kg	180
Meat 4.8kg/	57.6 kg	50 /kg	2,880
Edible oil 2.4l /	28.8 l	150 /l	4,320
Bean 19.2kg/	230.4 kg	801.49 /90kg	2,051.8
<hr/>			
Total inflation rate			11,542.5
+ 1.75			6,595.7
Clothing			
	boots, overcoats, trousers for the first year, jackets, trousers for the second year		
Agriculture input			
		price of unit (1990)	
Seed(maize) for 2ha	7.6 kg	11.84/kg	90.0
Fertilizer (Basal)	90 kg	7.66/kg	689.4
(Top dress)	18.2 kg	7.68/kg	139.8
Agriculture tools	To offer hoe, ax, rake, pick		
<hr/>			
Sub-total			919.2 kw
<hr/>			
Total			7,514.9 kw

Therefore, settlers were offered these incentives and they do not have any other living difficulty other than their income.

These farmer's economy has shown that non-agricultural income is higher than agricultural income, and the percentage of fertilizer costs is high for the farming expenses. This result was due to small cultivation areas, poor harvests and the low prices of the market.

Meteorological Data

Maximum Temperature (°C) Lusaka Int. Airport													
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
69/70	25.2	26.7	31.1	31.5	29.2	27.5	27.7	27.8	28.8	27.3	26.8	24.1	27.8
70/71	24.4	28.0	19.4	31.7	28.8	27.9	25.9	26.6	27.9	28.3	25.5	22.9	26.4
71/72	23.5	26.7	30.3	31.5	30.7	29.7	26.8	27.6	27.7	26.9	26.4	23.7	27.6
72/73	24.5	26.3	31.1	32.1	27.7	26.3	28.5	27.4	28.1	26.9	27.6	22.8	27.4
73/74	23.3	27.5	28.8	32.7	29.8	26.1	25.5	26.2	24.8	25.5	24.2	23.6	26.5
74/75	24.2	24.6	29.6	30.0	31.9	27.0	26.9	27.3	26.1	27.0	26.9	22.8	27.0
75/76	23.5	24.7	29.7	30.5	30.6	27.8	26.3	26.6	26.2	24.9	23.5	22.9	26.4
76/77	24.1	26.7	30.9	33.3	33.1	26.8	28.0	27.5	26.6	26.5	27.1	24.6	27.9
77/78	22.2	28.1	30.9	31.8	29.6	26.6	26.8	27.1	26.3	25.3	24.5	22.1	26.8
78/79	23.6	27.2	30.6	31.5	28.9	27.2	25.8	28.3	27.0	27.4	26.0	23.1	27.2
79/80	22.4	23.9	31.0	30.9	30.7	27.2	28.8	27.8	27.1	26.8	25.5	22.7	27.1
80/81	22.9	17.1	29.5	30.9	31.5	29.9	28.1	26.7	26.8	26.0	22.9	23.1	26.3
81/82	23.5	26.1	28.9	31.0	30.1	30.2	26.8	27.0	28.9	27.8	25.0	24.6	27.5
82/83	25.1	26.3	31.1	32.7	33.1	27.7	28.9	29.1	30.3	29.1	28.4	25.8	29.0
83/84	24.3	26.7	30.9	33.2	29.6	26.7	29.1	27.9	28.0	26.7	27.3	24.0	27.9
84/85	24.1	25.6	30.4	31.0	29.9	26.8	27.7	26.8	27.3	26.8	25.3	23.7	27.1
85/86	23.7	27.2	29.7	28.3	29.5	28.1	26.9	27.3	27.0	25.9	24.8	22.9	26.8
86/87	24.9	26.7	31.7	32.2	33.4	28.5	28.0	29.3	29.3	29.7	27.5	24.1	28.8
87/88	24.9	27.4	30.5	31.8	31.5	27.8	28.4	25.2	27.7	28.6	25.7	25.1	27.9
88/89	23.1	26.9	29.0	29.5	28.3	28.3	25.9	25.3	27.1	24.9	24.4	22.7	26.3
89/90	25.3	25.8	28.1	32.6	31.5	28.5	26.8	27.4	28.4	28.1	26.3	25.8	27.9
Mean	23.9	26.0	29.7	31.5	30.4	27.7	27.3	27.2	27.5	27.0	25.8	23.7	27.3
σ	0.9	2.3	2.5	1.2	1.5	1.1	1.1	1.0	1.2	1.3	1.4	1.0	0.7

Minimum Temperature (°C) Lusaka Int. Airport													
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
69/70	8.5	9.7	13.8	16.1	18.0	17.2	17.4	17.1	18.6	13.3	10.2	8.2	14.0
70/71	7.4	9.8	12.2	15.7	17.1	17.1	17.3	16.5	13.8	15.3	9.8	7.2	13.3
71/72	6.9	8.5	13.7	16.5	16.5	18.3	17.4	16.2	16.7	14.2	12.5	7.4	13.7
72/73	6.9	8.8	13.4	16.9	16.6	17.1	17.4	15.9	16.6	13.6	10.4	7.5	13.4
73/74	7.0	9.8	12.7	15.1	16.0	17.5	17.1	17.3	15.0	12.8	10.8	6.4	13.1
74/75	7.5	8.0	12.4	14.9	17.0	18.1	17.4	17.2	16.1	14.2	11.3	8.1	13.5
75/76	6.2	6.3	11.9	15.9	17.5	17.6	17.1	17.2	16.9	14.5	9.9	8.0	13.3
76/77	6.8	9.9	13.3	16.8	17.9	18.3	17.4	17.2	16.5	12.7	11.2	7.8	13.8
77/78	5.8	9.4	13.4	16.7	16.8	17.5	18.2	18.1	17.5	15.1	9.9	7.2	13.8
78/79	6.9	9.3	13.2	16.8	17.4	17.6	15.4	17.0	16.7	13.1	9.6	7.8	13.4
79/80	5.7	9.6	13.7	15.5	17.8	17.9	17.1	17.8	16.0	14.8	9.3	6.1	13.4
80/81	6.0	9.1	12.5	15.3	17.8	18.2	17.8	17.9	16.9	13.2	9.3	5.9	13.3
81/82	7.3	8.7	12.1	15.2	17.9	18.4	18.1	17.5	15.8	14.1	10.1	8.3	13.6
82/83	8.1	8.6	13.0	16.3	18.5	18.3	18.0	17.7	16.9	14.9	12.6	9.4	14.4
83/84	8.5	8.5	13.0	17.0	18.2	17.9	16.8	17.3	16.3	13.4	11.3	8.1	13.9
84/85	7.3	8.9	13.6	15.5	16.5	18.1	17.9	17.0	16.8	12.5	9.9	6.6	13.4
85/86	6.4	9.2	12.1	16.2	16.5	16.9	7.6	17.4	16.0	14.9	10.0	7.2	12.5
86/87	7.3	10.2	14.5	15.8	18.3	19.1	17.5	17.5	17.4	14.1	11.7	7.5	14.2
87/88	9.0	10.9	13.1	16.6	16.3	17.4	18.5	17.2	17.5	14.9	10.2	9.5	14.3
88/89	8.0	10.1	12.5	16.1	18.5	18.7	18.2	17.7	16.9	14.0	11.7	7.4	14.2
89/90	8.0	9.1	12.7	16.7	16.9	17.9	18.3	17.7	15.6	14.9	13.7	10.8	14.4
Mean	7.2	9.2	13.0	16.1	17.3	17.9	17.0	17.3	16.5	14.0	10.7	7.7	13.7
σ	0.9	0.9	0.7	0.6	0.8	0.6	2.2	0.5	1.0	0.8	1.2	1.1	0.5

Meteorological Data

Mean Temperature (°C)		Lusaka Int. Airport											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
73/74	15.0	17.3	22.3	24.4	21.5	20.9	20.4	20.5	20.1	18.4	16.9	14.4	19.3
74/75	14.6	18.3	20.1	23.7	22.8	20.7	21.1	21.0	20.5	19.8	18.3	14.8	19.6
75/76	15.1	16.1	20.6	22.2	24.0	21.3	20.6	20.7	20.3	18.9	16.1	14.9	19.2
76/77	14.3	15.7	21.2	22.9	23.4	21.6	21.7	21.3	20.5	18.9	18.6	15.5	19.6
77/78	15.2	17.6	22.2	25.0	24.6	21.5	21.1	21.3	20.8	19.2	16.4	13.8	19.9
78/79	13.2	18.2	21.5	23.7	22.6	21.0	21.2	21.7	20.8	19.6	17.1	14.9	19.6
79/80	14.6	17.8	21.5	24.0	22.2	21.2	22.0	22.1	20.7	20.0	17.0	13.8	19.7
80/81	13.5	16.8	21.9	23.0	24.6	21.5	21.7	21.2	21.2	18.8	15.8	13.8	19.5
81/82	14.0	17.5	20.2	22.9	24.3	23.1	21.5	21.5	21.5	20.2	16.7	15.7	19.9
82/83	15.2	17.3	19.9	22.0	23.2	22.7	22.4	23.6	22.2	21.1	19.7	17.0	20.5
83/84	16.1	16.9	22.0	23.3	24.7	21.8	22.1	21.4	21.0	19.9	18.6	15.5	20.3
84/85	16.1	17.3	22.3	24.8	23.1	21.1	21.3	20.9	21.1	19.2	17.0	14.6	19.9
85/86	15.3	17.1	21.7	23.0	22.9	21.6	21.3	21.2	20.7	19.8	16.9	14.9	19.7
86/87	14.9	17.6	20.6	22.8	22.5	21.7	21.8	22.8	23.2	21.5	19.1	15.4	20.3
87/88	15.2	18.6	22.6	23.6	25.5	22.5	22.5	21.8	21.9	21.1	17.5	16.5	20.8
88/89	16.1	17.9	21.3	23.4	23.5	22.1	21.3	21.1	21.0	19.4	16.9	15.0	19.9
89/90	15.0	17.7	21.2	23.1		22.6	21.5	21.1	21.3	20.3	18.2	16.7	18.2
Mean	14.9	17.4	21.4	23.4	23.5	21.7	21.5	21.5	21.1	19.8	17.5	15.1	19.8
σ	0.8	0.7	0.8	0.8	1.0	0.7	0.5	0.7	0.7	0.8	1.1	0.9	0.6

Relative Humidity (%)		Lusaka Int. Airport											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
73/74		47.0	39.0	46.0	72.0	83.0	85.0	87.0	83.0	75.0	64.0	64.0	67.7
74/75	65.0	57.0	52.0	46.0	65.0	83.0	81.0	76.0	77.0	65.0	67.0	67.0	66.8
75/76	53.0	54.0	47.0	43.0	51.0	79.0	81.0	86.0	79.0	75.0	67.0	67.0	65.2
76/77	57.0	52.0	45.0	57.0	65.0	73.0	79.0	85.0	85.0		61.0	61.0	65.5
77/78	61.0	57.0	46.0	43.0	57.0		87.0	85.0	85.0	78.0	74.0	74.0	67.9
78/79	68.0	54.0	48.0	68.0	65.0	85.0	80.0	83.0	83.0	67.0	60.0	60.0	68.4
79/80	60.0	54.0	45.0	48.0	71.0	81.0	77.0	78.0	78.0	62.0	62.0	62.0	64.8
80/81	67.0	58.0	51.0	54.0	65.0	80.0	82.0	83.0	83.0	74.0	69.0	69.0	69.6
81/82	65.0	55.0	43.0	53.0	57.0	68.0	83.0	75.0	75.0	67.0	64.0	64.0	64.1
82/83	58.0	54.0	54.0	60.0	64.0	74.0	78.0	75.0	75.0	64.0	60.0	60.0	64.7
83/84	57.0	49.0	44.0	49.0	54.0	75.0	72.0	78.0	78.0	63.0	64.0	64.0	62.3
84/85	57.0	49.0	41.0	42.0	61.0	80.0	81.0	79.0	79.0	67.0	63.0	63.0	63.5
85/86	60.0	53.0	46.0	46.0	59.0	78.0	81.0	77.0	77.0	73.0	68.0	68.0	65.5
86/87	62.0	53.0	51.0	62.0	66.0	75.0	79.0	71.0	71.0	61.0	58.0	58.0	63.9
87/88	53.0	50.0	51.0	48.0	50.0	80.0	78.0	80.0	80.0	67.0	66.0	66.0	64.1
88/89	64.0	55.0	46.0	51.0	54.0	74.0	84.0	83.0	83.0	71.0	70.0	70.0	67.1
Mean	60.5	53.2	46.8	51.0	61.0	77.9	80.5	80.1	79.4	68.6	64.8	64.8	65.7
σ	4.5	3.0	4.0	7.3	6.5	4.4	3.4	4.5	3.9	5.2	4.1	4.1	4.7

Meteorological Data

Evaporation (mm/day)		Lusaka Int. Airport											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
74/75				10.6	8.2	5.4	4.5	3.8	5.8	8.3	7.3	5.6	6.6
75/76	4.8	6.8	8.1	8.3	8.9	4.3		4.1	2.7	4.5	4.1	4.4	5.5
76/77	4.5		7.8	6.9	7.6	5.3	5.2	4.5	6.5	6.9		7.5	6.3
77/78	6.5	7.5	8.1	9.8	8.7	3.4		3.9	4.6	3.9	5.3	3.9	6.0
78/79	3.9	5.7	5.8	8.2	7.0	4.0	5.3	5.6	4.8	6.0	6.5	5.7	5.7
79/80	5.7	6.4	8.3	7.6	7.7	4.3	7.1	5.7	5.1	4.6	5.9	5.5	6.2
80/81	5.5	7.9	9.0	9.0	8.1	4.2	5.3	4.3	6.0	6.0	5.6	4.7	6.3
81/82	4.7	6.1	9.0	7.2	8.4	7.5	3.4	4.2	7.7	6.8	7.1	5.6	6.5
82/83	5.6	8.7	10.8	8.9	8.6	8.7	6.3	7.2	8.9	7.5	10.8	10.0	8.5
83/84	10.0	9.1	10.0	9.5	9.0	5.1	7.8	6.5	7.5	8.9	9.7	9.1	8.5
84/85	9.1	7.3	8.5	9.7	7.5	5.1	6.6	5.0	4.8	8.4	7.3	7.3	7.2
85/86	7.0	8.3	9.0	8.6	5.6	4.6			6.3	6.0	7.4	8.3	7.1
86/87	6.5												6.5
89/90	6.9	7.7	9.1	8.4					7.7	7.3	6.3	5.3	7.3
Mean	6.2	7.4	8.6	8.7	7.9	5.2	5.7	5.0	6.0	6.5	6.9	6.4	6.7
σ	1.7	1.0	1.2	1.0	0.9	1.5	1.3	1.1	1.6	1.5	1.8	1.8	0.9

Windspeed (m/s)		Lusaka Int. Airport											
Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
69/70							1.5	2.6	2.6	3.6	3.6	3.6	2.9
70/71	3.1	3.6	4.1	4.6	3.1	3.1	2.1	2.6	3.6	3.6	3.6	4.1	3.4
71/72	3.6	3.6	4.1	4.1	3.1	2.1	2.1	3.1	2.6	3.1	3.6	3.6	3.2
72/73	4.1	4.1	4.6	4.1	4.1	2.6		2.6	2.6	4.1	3.1	4.1	3.6
73/74	4.1	4.6	4.1	4.6	3.1	2.6	2.1	2.1	3.1		2.6	3.1	3.3
74/75	3.6	4.1	4.6	4.6	3.6	2.6	2.6	2.1	3.1	3.1	3.1	3.6	3.4
75/76	3.1	4.6	4.6	4.6	3.1	2.6	2.1	2.6	2.6	3.1	3.1	3.1	3.3
76/77	3.1	5.1	4.6	3.6	2.6	2.6	2.6	2.6	3.1	2.6	2.6	3.1	3.2
77/78	4.1	4.1	3.6	4.6	3.1	2.6	2.1	2.1	3.1	3.1	3.1	4.6	3.3
78/79	3.6	3.6	4.1	3.6	3.1	2.6	2.6	2.1	3.1	3.1			3.1
79/80	4.6	4.1	4.6	3.6	3.1	2.6	2.1	2.1	2.6	2.6	2.6	3.1	3.1
mean	3.7	4.2	4.3	4.2	3.2	2.6	2.2	2.4	2.9	3.2	3.1	3.6	3.3
σ	0.5	0.5	0.3	0.4	0.4	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.4

Hydrological Data

Discharge m ³ /s		Ngwerere E.W. 5-016										
Year	Item	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
73/74	Mean	0.606	0.715	0.653	0.503	0.660	0.711	0.448	0.253	0.168		
	Max	0.606	0.869	0.907	0.916	1.079	1.231	0.726	0.371	0.168		
	Min	0.606	0.562	0.341	0.254	0.168	0.441	0.254	0.168	0.168		
74/75	Mean		0.505	0.551	0.649	0.757	0.666	0.417		0.322		
	Max		1.260	1.514	1.082	1.455	1.028	0.562		0.341		
	Min		0.168	0.168	0.341	0.493	0.254	0.254		0.303		
75/76	Mean		0.441	0.524	0.443	0.524	0.680	0.614	0.473	0.351	0.314	0.252
	Max		0.441	1.392	0.837	0.792	1.514	0.773	0.562	0.477	0.420	0.420
	Min		0.441	0.254	0.168	0.254	0.254	0.477	0.303	0.168	0.168	0.168
76/77	Mean	0.441	0.481	0.538	0.435	0.628	0.678	0.401	0.297			
	Max	0.441	0.767	1.184	0.902	1.104	1.174	0.596	0.341			
	Min	0.441	0.254	0.168	0.168	0.254	0.523	0.254	0.254			
77/78	Mean	0.942	0.547	0.846	1.031	1.001	1.133	1.053	0.731	0.571	0.590	0.557
	Max	0.942	0.912	1.642	1.506	1.565	1.568	1.380	0.947	0.663	0.680	0.654
	Min	0.942	0.254	0.254	0.786	0.786	0.837	0.696	0.536	0.420	0.477	0.508
78/79	Mean	1.000	1.515		1.459	1.468	1.479		1.413	1.436	1.435	1.408
	Max	1.516	1.583		1.568	1.588	1.591		1.435	1.460	1.451	1.432
	Min	0.168	1.486		1.419	1.430	1.409		1.404	1.415	1.417	1.380
79/80	Mean	1.379	1.421	1.373	1.301	1.257	1.171	1.060	0.979	1.522	1.771	1.740
	Max	1.435	1.641	1.421	1.560	1.652	1.346	1.192	1.052	1.819	1.787	1.760
	Min	1.348	1.369	1.327	1.154	1.149	0.987	0.987	0.938	0.983	1.760	1.703
80/81	Mean	1.657	1.628	1.557	1.365	1.333	1.080	0.840	0.829	0.745	0.687	0.597
	Max	1.681	1.746	1.729	1.734	1.710	1.899	1.221	1.151	0.798	0.726	0.645
	Min	1.622	1.601	1.274	1.174	1.174	0.864	0.767	0.767	0.680	0.562	0.460
81/82	Mean	0.486	0.566	0.673	1.158	1.016	0.744	0.647	0.571	0.514	0.443	0.465
	Max	0.549	0.951	1.659	1.607	1.373	0.853	0.912	0.645	0.574	0.508	0.562
	Min	0.420	0.254	0.460	0.626	0.821	0.654	0.585	0.508	0.460	0.341	0.341
82/83	Mean		0.563	0.624	0.675	0.800	0.646	0.557	0.498	0.446	0.449	0.411
	Max		1.017	0.979	1.539	1.632	0.848	0.654	0.562	0.493	0.493	0.493
	Min		0.254	0.508	0.460	0.585	0.596	0.477	0.441	0.303	0.371	0.168
83/84	Mean	0.263	0.443	0.606		0.745	0.629	0.527	0.419	0.490	0.438	0.317
	Max	0.460	0.636	1.338		1.314	0.792	0.733	0.493	0.536	0.508	0.420
	Min	0.168	0.168	0.341		0.562	0.536	0.254	0.168	0.441	0.371	0.254
84/85	Mean		0.612	0.741	0.752	1.066	0.805	0.697	0.706	0.681	0.658	0.518
	Max		0.853	1.208	1.334	1.228	1.035	0.740	0.733	0.696	0.688	0.562
	Min		0.254	0.441	0.536	0.967	0.733	0.626	0.672	0.663	0.549	0.477
85/86	Mean	0.464	0.516	1.150	1.097	1.136	1.014	1.157	1.023	0.911		
	Max	0.672	0.617	1.739	1.636	1.660	1.236	1.891	1.248	0.938		
	Min	0.254	0.371	0.864	0.858	1.031	0.916	0.898	0.925	0.888		
87/88	Mean									0.704	0.665	0.623
	Max									0.760	0.680	0.654
	Min									0.663	0.636	0.523
89/90	Mean	0.662		0.724	1.161	1.116	0.947	0.933	0.905		0.792	0.780
	Max	0.719		0.971	1.599	1.503	1.258	1.384	0.987		0.798	0.792
	Min	0.596		0.663	0.925	0.975	0.893	0.883	0.848		0.786	0.767
Mean	Mean	0.718	0.766	0.812	0.859	0.965	0.885	0.719	0.700	0.682	0.749	0.697
	Max	1.681	1.746	1.739	1.734	1.710	1.899	1.891	1.435	1.819	1.787	1.760
	Min	0.168	0.168	0.168	0.168	0.168	0.254	0.254	0.168	0.168	0.168	0.168

Hydrological Data

Discharge (m³/Ngwerere Conf 5-024)

Year	Item	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
76/77	Mean				3.587	4.297	4.386	1.432	0.866	0.705	0.728	0.641	0.489	1.670
	Max.				7.252	10.724	10.066	1.976	1.052	0.813	0.833	0.773	0.574	10.724
	Min.				2.320	1.123	2.009	1.052	0.773	0.625	0.643	0.541	0.354	0.354
77/78	Mean	0.387	0.448	2.892	9.694	9.102	8.835	6.737	2.704	2.078	1.731	1.255	0.908	2.931
	Max.	0.625	0.896	9.354	10.977	10.724	10.977	10.977	3.360	2.466	1.911	1.516	1.075	10.977
	Min.	0.271	0.271	0.896	6.724	6.156	4.721	3.360	2.320	1.911	1.488	1.052	0.735	0.271
78/79	Mean	0.784	0.677	5.180	1.849	2.067	3.008	1.104	0.702	0.679	0.669	0.340	0.176	1.440
	Max.	1.247	0.917	10.557	3.494	3.864	9.986	2.009	0.813	0.754	0.754	0.541	0.305	10.557
	Min.	0.643	0.510	0.510	1.324	1.298	1.405	0.813	0.643	0.625	0.510	0.191	0.087	0.087
79/80	Mean	0.358	0.703	4.375	2.109	4.158	5.833	1.720	0.903	0.769	0.765	0.600	0.469	1.884
	Max.	0.558	3.449	16.086	6.468	23.951	20.454	3.186	1.123	0.896	0.833	0.679	0.574	23.951
	Min.	0.141	0.209	1.298	0.735	1.196	1.516	1.123	0.833	0.697	0.625	0.479	0.087	0.141
80/81	Mean	0.334	0.437	1.331	3.464	13.752	7.570	2.681	3.793		0.958	0.753	0.533	2.977
	Max.	0.494	1.075	3.059	9.354	26.087	26.498	23.304	17.043		1.099	0.896	0.661	26.498
	Min.	0.209	0.249	0.661	0.813	5.792	2.249	1.460	1.632		0.833	0.625	0.407	0.209
81/82	Mean	0.411	0.574	0.655	5.675	9.675	1.994	1.044	0.769	0.584	0.594	0.576	0.431	1.876
	Max.	0.464	1.632	1.405	16.935	35.648	4.408	1.221	1.029	0.679	0.679	0.697	0.591	35.648
	Min.	0.367	0.341	0.393	0.191	2.214	1.221	0.875	0.625	0.525	0.525	0.421	0.282	0.191
82/83	Mean	0.520	0.524	1.020	2.039	2.140	0.883	0.508	0.280	0.228	0.211	0.189		0.768
	Max.	1.662	2.249	3.272	9.667	4.721	2.618	2.734	0.341	0.305	0.367	0.271		9.667
	Min.	0.229	0.219	0.317	0.354	0.773	0.464	0.229	0.209	0.170	0.156	0.133		0.133
83/84	Mean	0.157	0.269	0.719	0.985	1.444	0.466	0.312	0.101	0.094	0.054	0.083	0.095	0.419
	Max.	0.271	0.541	2.076	2.656	5.557	0.773	0.591	0.219	0.148	0.105	0.625	0.126	5.557
	Min.	0.070	0.112	0.229	0.393	0.354	0.293	0.182	0.060	0.060	0.032	0.006	0.060	0.006
84/85	Mean		0.267	0.793	2.034	7.059	1.191	0.391	0.215	0.207	0.185	0.141	0.076	1.112
	Max.		0.983	3.059	9.510	19.395	3.017	0.754	0.239	0.271	0.260	0.182	0.165	19.395
	Min.		0.093	0.093	0.260	0.917	0.464	0.229	0.182	0.148	0.133	0.112	0.032	0.032
85/86	Mean	0.117	0.162	0.933	7.998	6.122	3.324	6.628	1.571	0.827	0.558	0.282	0.189	2.396
	Max.	0.271	0.305	3.723	19.395	12.744	17.369	35.002	3.316	1.075	0.661	0.525	0.239	35.002
	Min.	0.043	0.081	0.093	1.460	2.393	0.896	0.679	1.052	0.661	0.393	0.209	0.156	0.043
86/87	Mean	0.417	0.404	3.711	5.458	2.440	0.791	0.295	0.208	0.139	0.135	0.107	0.074	1.181
	Max.	1.574	0.716	20.935	20.335	5.674	2.579	0.591	0.282	0.191	0.173	0.148	0.173	20.935
	Min.	0.165	0.229	0.525	0.421	0.961	0.305	0.219	0.156	0.112	0.105	0.081	0.055	0.055
87/88	Mean	0.104	0.066	1.079	0.767	1.715	1.321	0.324	0.151	0.142	0.127	0.109		0.567
	Max.	0.182	0.156	5.158	4.058	5.972	3.316	0.479	0.182	0.182	0.156	0.119		5.972
	Min.	0.075	0.035	0.112	0.200	0.191	0.541	0.165	0.126	0.119	0.099	0.105		0.035
88/89	Mean			0.412	4.431	20.565	11.725	3.347	1.310	0.920	0.566	0.360	0.200	4.397
	Max.			1.272	12.561	17.257	12.111	14.460	1.847	1.052	0.661	0.541	0.282	17.257
	Min.			0.219	0.494	6.531	2.774	1.784	1.006	0.625	0.435	0.249	0.165	0.165
89/90	Mean	0.214	0.300	0.527	5.799	8.093	2.008	1.133	0.754	0.396	0.282	0.214	0.172	1.619
	Max.	0.305	1.460	2.734	17.369	22.165	5.441	2.734	3.143	0.541	0.380	0.293	0.229	22.165
	Min.	0.141	0.133	0.105	1.784	3.584	0.961	0.697	0.421	0.305	0.191	0.165	0.133	0.105
Mean	Mean	0.346	0.403	1.817	3.992	6.616	3.810	1.915	1.023	0.597	0.540	0.403	0.318	1.803
	Max.	1.662	3.449	20.935	20.335	17.257	12.111	35.002	17.043	2.466	1.911	1.516	1.075	17.257
	Min.	0.043	0.035	0.093	0.191	0.191	0.293	0.165	0.060	0.060	0.032	0.006	0.032	0.006

Hydrological Data

Discharge (m3/s) Chongwe R. B. 5-025

Year	Mean	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
73/74	Mean	0.234	1.149	1.650	5.401	16.921	23.442	4.569	2.268	1.659	1.686	1.426	1.044	5.057
	Max.	0.375	3.707	3.313	13.498	33.160	72.424	16.403	3.545	1.847	1.800	1.555	1.264	72.424
	Min.	0.091	0.109	1.160	2.048	7.034	4.137	2.236	1.872	1.597	1.555	1.282	0.747	0.091
74/75	Mean	0.561	1.688	10.304	19.779	24.038	12.727	3.353	2.063	1.889	1.746	1.584	1.182	6.652
	Max.	0.747	7.170	51.415	89.430	71.605	43.698	5.008	2.350	2.022	1.896	1.641	1.473	89.430
	Min.	0.411	0.292	2.264	5.778	3.707	4.557	2.408	1.847	1.824	1.619	1.493	0.901	0.292
75/76	Mean	0.778	0.513	1.724	2.139	4.831	21.052	10.361	3.087	2.244	1.990	1.708	1.352	4.328
	Max.	0.901	0.887	2.717	4.274	10.912	122.403	40.455	3.832	2.498	2.264	1.872	1.597	122.403
	Min.	0.635	0.492	0.972	1.513	2.379	1.641	3.506	2.498	2.100	1.776	1.555	1.126	0.492
76/77	Mean	1.134	1.283	2.720	2.956	8.968	14.820	2.437	1.613	1.389	1.343	1.282	0.942	3.382
	Max.	3.666	1.663	8.570	7.170	23.997	51.100	3.389	1.847	1.513	1.413	1.394	1.110	51.100
	Min.	0.834	0.887	1.110	1.753	2.653	3.626	1.847	1.473	1.282	1.264	1.126	0.723	0.723
77/78	Mean	0.640	0.656	10.132	79.906	92.863	72.750	39.762	6.685	4.543	3.905	2.358	1.940	28.465
	Max.	1.031	1.896	85.149	170.388	120.866	332.561	237.941	8.809	5.836	4.904	2.408	2.292	120.866
	Min.	0.368	0.355	0.759	20.226	21.642	13.055	9.135	5.437	3.918	3.749	2.321	1.534	0.355
78/79	Mean	1.608	1.562	30.426	4.852	5.817	8.531	2.434	1.858	2.245	2.478	2.033		5.837
	Max.	2.528	2.468	158.730	9.302	10.263	25.613	4.093	2.264	2.559	2.653	2.208		158.730
	Min.	1.355	1.110	1.110	2.917	3.056	3.275	1.872	1.641	1.996	2.074	1.824		1.110
79/80	Mean	1.115	1.878	14.022	7.959	12.663	29.236	4.954	2.457	2.121	2.087	1.706	1.480	6.697
	Max.	1.597	4.803	63.053	21.481	96.419	172.797	9.643	2.986	2.350	2.208	1.896	2.048	172.797
	Min.	0.747	0.584	3.666	2.350	3.918	4.004	3.056	2.236	1.413	1.872	1.493	1.300	0.584
80/81	Mean	1.633	1.526	3.395	10.539	67.894	26.601	7.659	11.263	3.915	3.456	2.894	2.015	11.528
	Max.	2.236	2.653	6.257	27.897	205.655	132.607	53.990	111.087	4.605	3.790	3.275	2.438	205.655
	Min.	1.016	1.016	1.945	2.468	16.403	6.445	4.803	4.803	3.749	3.128	2.468	1.473	1.016
81/82	Mean	1.340	1.640	2.038	27.206	52.991	7.184	4.251	3.301	2.736	2.830	2.619	2.178	8.925
	Max.	1.555	3.961	6.196	102.201	240.017	12.100	6.966	4.182	2.986	3.128	3.545	3.545	240.017
	Min.	1.143	0.929	1.143	2.653	0.082	4.413	3.275	2.883	2.621	2.438	2.127	1.211	0.082
82/83	Mean	2.276	2.031	4.269	6.936	7.727	3.518		2.634	2.323	1.263	0.973	0.472	3.102
	Max.	5.720	6.702	9.387	28.894	15.888	7.102		3.427	2.783	2.100	1.264	0.821	28.894
	Min.	1.016	0.771	1.945	2.408	3.128	2.528		2.208	1.708	0.860	0.783	0.265	0.265
83/84	Mean	0.477	0.849	2.254	3.005	3.778	1.947	1.473	0.490	0.456	0.276	0.184	0.133	1.269
	Max.	0.929	1.555	3.961	6.382	6.833	3.164	2.154	1.031	0.759	0.458	0.185	0.177	6.833
	Min.	0.229	0.322	1.078	1.663	1.800	1.318	1.016	0.181	0.275	0.189	0.177	0.061	0.061
84/85	Mean	0.026	0.666	3.340	5.661	26.895	5.261	2.499	1.512	1.433	1.347	0.814	0.353	3.995
	Max.	0.056	1.619	6.257	17.064	74.086	11.298	3.626	1.753	1.576	1.619	1.143	0.645	74.086
	Min.	0.006	0.002	0.860	1.896	4.654	3.313	1.776	1.394	1.318	1.047	0.206	0.166	0.002
85/86	Mean	0.101	1.106	2.594	38.560	31.570		33.543	6.196	4.197	3.308	2.340	1.400	11.190
	Max.	0.162	1.753	8.031	116.937	137.950		289.343	9.905	4.854	3.832	2.849	1.945	289.343
	Min.	0.047	0.053	0.419	5.954	9.643		4.093	4.753	3.707	2.849	1.921	1.062	0.047
86/87	Mean	1.795	1.859	16.045	36.533	9.882	4.809	3.092	2.248	1.784	1.729	1.249	0.534	6.868
	Max.	3.961	2.621	118.737	133.266	37.898	8.971	4.508	3.021	1.971	2.074	1.708	0.986	133.266
	Min.	0.957	1.016	2.181	2.379	5.720	3.056	2.321	1.753	1.493	1.433	0.943	0.270	0.270
87/88	Mean	0.595	0.237	3.585	3.341	7.521		3.318				0.439	0.145	2.481
	Max.	0.915	0.536	8.336	9.993	25.247		4.182				0.546	0.368	25.247
	Min.	0.265	0.162	0.211	1.619	2.236		2.816				0.368	0.070	0.070
88/89	Mean	0.244	0.162	1.208	12.452	131.980	64.556	11.389	5.678	4.400	3.342	2.671	2.169	18.873
	Max.	0.546	0.355	2.986	57.347	507.466	183.734	29.096	7.663	4.753	3.749	2.986	2.350	507.466
	Min.	0.027	0.040	0.042	1.318	25.065	10.083	7.239	4.654	3.832	2.986	2.350	1.971	0.027
89/90	Mean	2.126	2.015	2.748	24.333	35.718	7.734	6.085	3.618	2.465	2.066	1.774	1.708	7.447
	Max.	3.238	3.275	7.308	82.385	94.381	19.770	8.729	9.219	2.816	2.181	1.945	1.824	94.381
	Min.	1.824	1.300	1.576	6.767	12.624	4.654	4.508	2.621	2.208	1.896	1.597	1.576	1.300
Mean	Mean	0.981	1.231	6.615	17.150	31.886	20.278	8.824	3.561	2.487	2.178	1.650	1.191	8.169
	Max.	5.720	7.170	158.730	170.388	507.466	183.734	289.343	111.087	5.836	4.004	3.545	3.545	507.466
	Min.	0.006	0.002	0.042	1.318	0.082	1.318	1.016	0.181	0.275	0.189	0.177	0.061	0.002

Hydrological Data

Discharge (m ³ /s) Kanakantapa Proposed Intake Site														
Year	Item	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
73/74	Mean	0.000	0.433	0.778	3.487	9.551	11.950	2.883	1.362	0.828	0.855	0.590	0.171	2.703
	Max.	0.000	2.472	2.188	8.063	16.743	31.024	9.477	2.357	1.007	0.963	0.726	0.408	31.024
	Min.	0.000	0.000	0.277	1.186	4.593	2.770	1.348	1.029	0.769	0.726	0.430	0.000	0.000
74/75	Mean	0.000	0.944	5.822	10.344	12.187	7.336	2.198	1.199	1.045	0.911	0.754	0.291	3.542
	Max.	0.000	4.673	23.700	36.593	30.748	20.844	3.348	1.443	1.164	1.051	0.811	0.641	36.593
	Min.	0.000	0.000	1.372	3.835	2.472	3.052	1.481	1.007	0.985	0.790	0.662	0.000	0.000
75/76	Mean	0.000	0.000	0.837	1.244	3.156	10.378	6.094	2.015	1.354	1.135	0.876	0.504	2.298
	Max.	0.000	0.000	1.739	2.863	6.741	46.750	19.609	2.560	1.564	1.372	1.029	0.769	46.750
	Min.	0.000	0.000	0.000	0.684	1.467	0.811	2.328	1.564	1.232	0.941	0.726	0.231	0.000
76/77	Mean	0.202	0.422	1.595	1.844	5.496	8.059	1.502	0.782	0.550	0.500	0.427	0.050	1.768
	Max.	2.443	0.833	5.473	4.673	12.920	23.586	2.244	1.007	0.684	0.578	0.557	0.208	23.586
	Min.	0.000	0.000	0.208	0.920	1.688	2.414	1.007	0.641	0.430	0.408	0.231	0.000	0.000
77/78	Mean	0.003	0.041	5.257	32.576	35.231	29.240	17.943	4.375	3.039	2.610	1.450	1.084	11.928
	Max.	0.079	1.051	35.216	60.479	121.995	101.642	78.392	5.606	3.871	2.679	1.491	1.396	121.995
	Min.	0.000	0.000	0.000	11.249	11.885	7.842	5.786	3.622	2.619	2.501	1.419	0.705	0.000
78/79	Mean	0.763	0.712	13.652	3.188	3.820	5.165	1.497	1.012	1.353	1.547	1.173		3.081
	Max.	1.589	1.540	57.235	5.878	6.397	13.616	2.740	1.372	1.613	1.688	1.325		57.235
	Min.	0.515	0.208	0.208	1.893	1.998	2.161	1.029	0.811	1.141	1.209	0.985		0.208
79/80	Mean	0.244	0.977	7.749	4.866	7.092	13.151	3.258	1.528	1.248	1.220	0.873	0.644	3.521
	Max.	0.769	3.215	27.828	11.813	38.809	61.142	6.063	1.945	1.443	1.325	1.051	1.186	61.142
	Min.	0.000	0.000	2.443	1.443	2.619	2.679	1.998	1.348	0.578	1.029	0.662	0.451	0.000
80/81	Mean	0.776	0.656	2.195	6.192	28.671	12.798	4.664	6.098	2.616	2.291	1.873	1.147	5.683
	Max.	1.348	1.688	4.129	14.583	70.000	49.760	24.631	43.345	3.084	2.530	2.161	1.515	70.000
	Min.	0.047	0.047	1.096	1.540	9.477	4.242	3.215	3.215	2.501	2.052	1.540	0.641	0.047
81/82	Mean	0.489	0.663	1.102	13.200	22.146	4.628	2.831	2.175	1.753	1.825	1.652	1.256	4.373
	Max.	0.726	2.649	4.091	40.615	78.923	7.357	4.553	2.801	1.945	2.052	2.357	2.357	78.923
	Min.	0.254	0.000	0.254	1.688	0.000	2.957	2.161	1.867	1.663	1.515	1.255	0.343	0.000
82/83	Mean	1.223	1.022	2.780	4.142	4.885	2.300		1.669	1.413	0.392	0.073	0.000	1.790
	Max.	3.799	4.396	5.924	14.999	9.231	4.633		2.272	1.790	1.232	0.408	0.000	14.999
	Min.	0.047	0.000	1.096	1.491	2.052	1.589		1.325	0.876	0.000	0.000	0.000	0.000
83/84	Mean	0.000	0.195	1.309	1.921	2.455	1.079	0.604	0.004	0.000	0.000	0.000	0.000	0.625
	Max.	0.000	0.726	2.649	4.204	4.474	2.079	1.278	0.079	0.000	0.000	0.000	0.000	4.474
	Min.	0.000	0.000	0.160	0.833	0.963	0.472	0.047	0.000	0.000	0.000	0.000	0.000	0.000
84/85	Mean	0.000	0.235	2.141	3.514	13.260	3.469	1.551	0.681	0.598	0.491	0.033	0.000	2.090
	Max.	0.000	0.790	4.129	9.791	31.580	6.943	2.414	0.920	0.747	0.790	0.254	0.000	31.580
	Min.	0.000	0.000	0.000	1.051	3.117	2.188	0.941	0.557	0.472	0.107	0.000	0.000	0.000
85/86	Mean	0.000	0.350	1.454	17.633	15.406		14.018	4.066	2.809	2.181	1.429	0.541	5.367
	Max.	0.000	0.920	5.169	45.115	51.314		91.240	6.205	3.248	2.560	1.841	1.096	91.240
	Min.	0.000	0.000	0.000	3.944	6.063		2.740	3.182	2.472	1.841	1.074	0.134	0.000
86/87	Mean	0.881	0.981	7.761	15.959	6.052	3.181	2.015	1.349	0.946	0.890	0.369	0.000	3.389
	Max.	2.649	1.663	45.655	49.952	18.620	5.696	3.020	1.972	1.119	1.209	0.876	0.000	49.952
	Min.	0.000	0.047	1.302	1.467	3.799	1.998	1.419	0.920	0.662	0.599	0.000	0.000	0.000
87/88	Mean	0.000	0.000	2.295	2.071	4.585		2.188				0.000	0.000	1.445
	Max.	0.000	0.000	5.342	6.253	13.459		2.801				0.000	0.000	13.459
	Min.	0.000	0.000	0.000	0.790	1.348		1.815				0.000	0.000	0.000
88/89	Mean	0.000	0.000	0.433	6.791	45.991	25.501	6.875	3.759	2.946	2.209	1.699	1.290	7.745
	Max.	0.000	0.000	1.945	25.828	141.024	135.888	15.083	4.959	3.182	2.501	1.945	1.443	141.024
	Min.	0.000	0.000	0.000	0.472	13.381	6.300	4.713	3.117	2.560	1.945	1.443	1.119	0.000
89/90	Mean	1.250	1.141	1.696	12.492	17.298	4.881	4.006	2.356	1.536	1.202	0.938	0.875	3.982
	Max.	2.133	2.161	4.754	34.318	38.167	11.042	5.561	5.832	1.815	1.302	1.096	0.985	38.167
	Min.	0.985	0.451	0.747	4.435	7.624	3.117	3.020	1.663	1.325	1.051	0.769	0.747	0.451
Mean	Mean	0.368	0.508	2.769	8.315	14.291	9.854	4.918	3.425	1.602	1.319	0.894	0.491	4.063
	Max.	3.799	4.673	57.235	60.479	141.024	135.888	91.240	43.345	3.871	2.679	2.357	2.357	141.024
	Min.	0.000	0.000	0.000	0.472	0.000	0.472	0.047	0.000	0.000	0.000	0.000	0.000	0.000

Hydrological Data

Water Disc Year	m ³ /s		Kanakanta Dam Site							Q=A*H ^{1.5} *B	A= 0.01013
	Oct	Nov	Dec	Jan	Feb	Mar	73/74 Apr	May	Jun		
1					5.288	10.652	5.453	1.064	0.980	0.777	
2					4.705	9.106	10.248	1.089	0.969	0.787	
3					4.780	8.172	10.315	1.040	0.923	0.817	
4					6.239	7.679	8.116	1.016	0.912	0.817	
5					5.088	6.424	6.285	1.004	0.890	0.837	
6					8.925	5.663	4.932	0.980	0.880	0.827	
7					14.234	7.056	4.486	0.934	0.827	0.817	
8					10.516	12.083	4.137	0.934	0.817	0.817	
9					6.956	27.943	3.324	1.616	0.817	0.807	
10					14.066	15.366	2.685	1.616	0.807	0.807	
11					11.934	31.595	2.357	2.471	0.797	0.807	
12					7.679	15.366	2.205	2.661	0.787	0.807	
13					12.693	8.513	2.142	2.269	0.787	0.807	
14					12.616	7.056	1.942	1.828	0.777	0.797	
15				4.205	7.519	5.411	1.756	1.616	0.767	0.797	
16				2.835	5.168	4.631	1.470	1.518	0.767	0.787	
17				1.756	3.210	4.137	1.348	1.348	0.758	0.777	
18				3.127	2.517	4.309	1.290	1.334	0.748	0.777	
19				2.357	3.714	4.379	1.220	1.305	0.739	0.767	
20				1.774	7.006	4.856	1.140	1.207	0.729	0.767	
21				0.858	11.208	12.008	1.127	1.140	0.720	0.758	
22				0.787	9.792	12.008	1.114	1.077	0.729	0.758	
23				0.777	10.858	10.382	1.052	1.028	0.729	0.748	
24				2.184	15.910	7.625	1.052	0.980	0.729	0.739	
25				2.184	9.664	4.003	1.028	0.969	0.729	0.739	
26				2.142	8.341	3.560	1.016	0.934	0.739	0.729	
27				1.847	10.449	2.734	1.004	1.004	0.739	0.729	
28				1.774	18.744	2.380	0.992	1.004	0.739	0.720	
29				1.738		2.184	0.969	1.004	0.748	0.720	
30				1.810		2.661	0.957	0.992	0.767	0.711	
31				3.840		4.450		0.980		0.711	
mean				2.117	8.922	8.529	2.905	1.289	0.795	0.776	
max.				4.205	18.744	31.595	10.315	2.661	0.980	0.837	
min.				0.777	2.517	2.184	0.957	0.934	0.720	0.711	

74 Date
3.869
Sep

Probability of Rainfall (m3/year)

Rainfall Chalimbana Agri.C

Return Period	Value	F[%]
1/500	400.2	0.20
1/200	433.7	0.50
1/100	463.0	1.00
1/50	496.8	2.00
1/40	508.8	2.50
1/30	525.4	3.33
1/25	536.6	4.00
1/20	551.1	5.00
1/10	603.3	10.00
1/5	672.0	20.00
1/4	699.7	25.00
1/3	741.9	33.33
1/2	821.9	50.00

Rainfall Chongwe

Return Period	Value	F[%]
1/500	361.1	0.20
1/200	393.7	0.50
1/100	423.0	1.00
1/50	457.4	2.00
1/40	469.8	2.50
1/30	487.1	3.33
1/25	498.8	4.00
1/20	514.2	5.00
1/10	570.5	10.00
1/5	647.0	20.00
1/4	678.7	25.00
1/3	727.6	33.33
1/2	822.8	50.00

Rainfall Kasisi Mission

Return Period	Value	F[%]
1/500	324.7	0.20
1/200	368.7	0.50
1/100	407.2	1.00
1/50	451.5	2.00
1/40	467.1	2.50
1/30	488.8	3.33
1/25	503.4	4.00
1/20	522.3	5.00
1/10	590.2	10.00
1/5	679.3	20.00
1/4	715.2	25.00
1/3	769.7	33.33
1/2	872.5	50.00

Rainfall Luska Int.Airport

Return Period	Value	F[%]
1/500	446.2	0.20
1/200	480.0	0.50
1/100	509.8	1.00
1/50	544.4	2.00
1/40	556.8	2.50
1/30	574.0	3.33
1/25	585.6	4.00
1/20	600.7	5.00
1/10	655.3	10.00
1/5	728.1	20.00
1/4	757.8	25.00
1/3	803.2	33.33
1/2	890.1	50.00

Probability of Discharge (m3/s)

Discharge Chongwe R.B. 5-025

Return Period	Value	F[%]
1/500	0.001	0.20
1/200	0.003	0.50
1/100	0.007	1.00
1/50	0.014	2.00
1/40	0.016	2.50
1/30	0.020	3.33
1/25	0.024	4.00
1/20	0.028	5.00
1/10	0.048	10.00
1/5	0.086	20.00
1/4	0.107	25.00
1/3	0.145	33.33
1/2	0.245	50.00

Droughty Discharge

Discharge Chongwe R.B. 5-025

Return Period	Value	F[%]
1/500	0.287	0.20
1/200	0.674	0.50
1/100	1.035	1.00
1/50	1.478	2.00
1/40	1.643	2.50
1/30	1.876	3.33
1/25	2.037	4.00
1/20	2.252	5.00
1/10	3.067	10.00
1/5	4.248	20.00
1/4	4.761	25.00
1/3	5.580	33.33
1/2	7.263	50.00

Mean Discharge

Discharge Chongwe R.B. 5-025

Return Period	Value	F[%]
1/500	1184.235	0.20
1/200	946.874	0.50
1/100	787.401	1.00
1/50	643.995	2.00
1/40	601.311	2.50
1/30	548.113	3.33
1/25	515.789	4.00
1/20	477.311	5.00
1/10	366.497	10.00
1/5	267.002	20.00
1/4	237.010	25.00
1/3	199.481	33.33
1/2	147.851	50.00

Flood Discharge

Probability of Hydrological

Continuos Droughty Days Kasisi Mision (days)

Return Period	Value	F[%]
1/500	290.553	0.20
1/200	276.791	0.50
1/100	265.908	1.00
1/50	254.497	2.00
1/40	250.708	2.50
1/30	245.671	3.33
1/25	242.415	4.00
1/20	238.318	5.00
1/10	224.807	10.00
1/5	209.461	20.00
1/4	203.909	25.00
1/3	196.074	33.33
1/2	182.964	50.00

24MAX.R Kasisi Mission (mm/day)

Return Period	Value	F[%]
1/500	121.316	0.20
1/200	114.096	0.50
1/100	108.355	1.00
1/50	102.303	2.00
1/40	100.285	2.50
1/30	97.598	3.33
1/25	95.857	4.00
1/20	93.662	5.00
1/10	86.389	10.00
1/5	78.061	20.00
1/4	75.029	25.00
1/3	70.732	33.33
1/2	63.492	50.00

Flood Discharge Kanakantapa River (m3/s)

Return Period	Value	F[%]
1/500	544.749	0.20
1/200	428.384	0.50
1/100	351.191	1.00
1/50	282.598	2.00
1/40	262.356	2.50
1/30	237.254	3.33
1/25	222.075	4.00
1/20	204.084	5.00
1/10	152.807	10.00
1/5	107.599	20.00
1/4	94.166	25.00
1/3	77.514	33.33
1/2	54.946	50.00

Droughty Discharge Kanakantapa River (m3/s)

Return Period	Value	F[%]
1/500	0.509	0.20
1/200	0.540	0.50
1/100	0.577	1.00
1/50	0.635	2.00
1/40	0.661	2.50
1/30	0.701	3.33
1/25	0.731	4.00
1/20	0.776	5.00
1/10	0.988	10.00
1/5	1.437	20.00
1/4	1.693	25.00
1/3	2.190	33.33
1/2	3.603	50.00

JICA