

- 4) Furniture and utensils except those fixed to the building
- 5) Legal procedures required in Malawi for this project
- 6) Banking charges (Advising commission of Authorization to pay and payment commission to the Japanese foreign exchange bank based upon the Banking Arrangement)
- 7) Tax exemption and custom clearance of equipment and material for the implementation of the project at the port of disembarkation
- 8) Proper and efficient maintenance and operation of facilities and equipment granted in the project

4-4-3 Construction Supervision Plan

Judging from the scale of construction, the consultant will dispatch one supervisor to be stationed at site throughout the whole process. The consultant also sends one structural engineer at the erection of roof truss, one equipment specialist at the delivery of equipment, and one senior supervisor at the completion inspection to the site for a short period of time respectively.

4-4-4 Equipment and Material Procurement Plan

(1) Procurement of Construction Material

The construction materials that can be procured in Malawi are limited to the primary products, such as aggregates, cement, sand, bricks, concrete blocks and timber. Steel material, reinforcing bars, various finishing materials, fixtures and equipment depend on import from the neighboring countries, Europe and Japan. Because the material supply from the neighboring countries has been unstable in recent years, the imported materials tend to become short, especially in steel and roofing materials. In addition, due to the extreme difficulty of obtaining the foreign currency for import because of Malawi's economic situation, the imported materials have become scarce occasionally.

Interruption and postponement of construction due to the material shortage are occurring frequently. Moreover, because of incapability of importing a large quantity of material at one time and the supply and demand relation is largely off balance, it is observed that the prices are escalating at each time of shipment arrival. The primary and basic products will be procured in Malawi as far as possible, but those which are unprocurable or unstable in quality or prices in Malawi will be procured in Japan. The following table shows the procurement demarcation on the principal materials for construction.

List of Major Building Materials and the Supplying Country (1)

Materials	Supplying Country		Remarks
	Malawi	Japan	
(Building Materials)			
Cement	o		Products of Malawi or imported from Zambia
Sand, Gravel	o		
Steel bar	o		Imported from Zimbabwe
Steel frames		o	Imported from neighboring countries, since constant supply and stable price cannot be expected.
Roofing material, Steel Hanger Door		o	Same reason as above.
Bricks, Concrete block	o		
Tiles, Terazzo	o		
Ceiling materials	o		

List of Major Building Materials and the Supplying Country (2)

Materials	Supplying Country		Remarks
	Malawi	Japan	
Wooden doors, Louver windows	o		
Plastering materials	o	o	Floor paint only from Japan, not locally available
PVC perforated pipe underdrainage		o	Only concrete pipe available in Malawi, price 40% higher than the Japanese product.
(Building Equipment)			
Distribution board		o	Reasonable to supply from Japan otherwise special order needed to Europe with problem of time, quality and performance.
Electric wire and power cable	o	o	Only main power cable and attachments from Japan
Conduit tubes	o		Imported from Zimbabwe
Lighting fixtures	o		Imported from England
Switch, Receptacle	o		Imported from England
PVC pipe	o		
Steel pipe	o	o	Only PVC lined steel pipe from Japan, not locally available.
Manhole cover	o		
Ventilation fan		o	English-made fan available in Malawi but price three times that of the Japanese product.
Sanitary Fixtures	o		

(2) Procurement of Equipment

Because of the equipment granted in this project being many in kind but small in quantity, and because of non-availability in Malawi and no special advantage in importing from third countries, all the equipment will be from Japan where the reliability is assured not only in prices but also in quality, performance and supply.

(3) Transportation Plan

Malawi, being an inland country without seaports, depends on its marine transportation on Beira or Nakara ports in the neighboring Mozambique, but the routes to these ports were severed in 1982 and 1984 respectively due to the disturbances in Mozambique. Therefore, the disembarking port of material transportation in this project will be Dar es Salaam of Tanzania, used currently as one of the importing bases of Malawi, from which the inland transportation will be carried out. There could be the following four methods of inland transportation from Dar es Salaam to the project site of Bangula:

1) Rail, road and lake combined route

Dar es Salaam rail Mbeya road Chilumba lake
Chipoka rail Bangula

2) Rail and road combined route (1)

Dar es Salaam rail Mbeya road Salima rail
Bangula

3) Rail and road combined route (2)

Dar es Salaam rail Mbeya road Bangula

4) Road only route

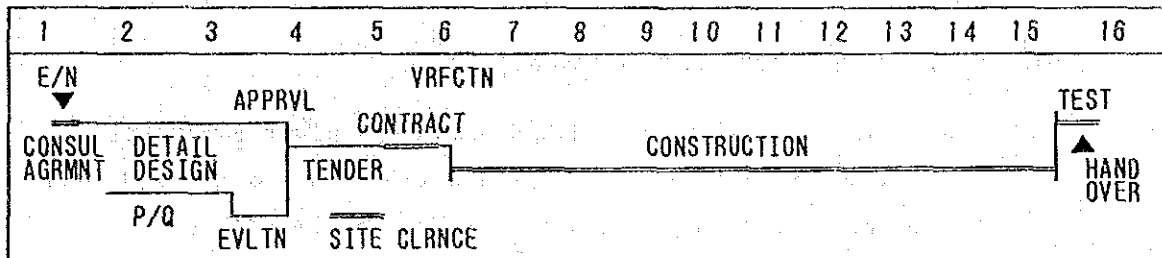
Dar es Salaam road Bangula

Route 1) is the lowest in transportation cost, but frequent re-loading may very likely cause damage and pilferage of the material and equipment. In addition, since it takes about one month to reach Bangula, the work schedule will suffer greatly. Route 2) still requires re-loading and use of a crane and lorries from Bangula Station to the site, though short in distance, again causing a log in the work schedule. Since the transportation mainly depending on lorries is most reliable for the work schedule and highest in safety, route 3) or 4) will be adopted.

4-5 Implementation Schedule

Below is the schedule chart. Estimation calls for 16 months from the conclusion of the Exchange of Notes until the completion of the project.

IMPLEMENTATION SCHEDULE



4-6 Maintenance Cost

The maintenance cost arising from the project warehouse is estimated as follows:

- 1) Manpower cost for workers

The capacity of the conveyor line is known as 560 bag/H, and the practical value is calculated taking operating efficiency and the weight of a bag as;

$$560 \times 50\% \times 90 \text{ kg} = 2.5 \text{ ton/H}$$

As the total handling amount of maize is

$16,700 \times 2 = 33,400$ tons, the operation will be

$33,400 \div 25.2 = 1,325.4$ hours i.e. 265 days.line

Ten workers are required to one job line for unloading and stacking or de-stacking and loading, thus the manpower cost is computed as $265 \times 10 \times 1.44\text{MK} = 3,816 \text{ MK/year}$.

2) Personnel cost for additional staff

One person each is required as rail weighbridge operator and measurement recorder. The annual personnel cost will be 2,160MK in total.

3) Maintenance and repair cost for equipment

4% of total price of conveyors, stackers and fog machines is assumed for the purpose.

It is computed as about 6,900MK.

4) Electricity charge for equipment

With a 1.5 KW conveyor and 2.2 KW stacker, power consumption is computed as $(1.5\text{KW} \times 2 + 2.2\text{KW}) \times 265 \times 5\text{H} = 6,890 \text{ KWH}$, and the charge will be $6,890 \times 0.13 \text{ MK/KWH} = 895.7 \text{ MK/Year}$.

5) Fuel cost for equipment

With 10 PS fog machine output, and 100 hours of operation per year, fuel cost will be computed as:

$10 \text{ PS} \times 0.45 \text{ liter/PSH} \times 100 \times 1.86 \text{ MK/liter} = 837 \text{ MK/Year}$

6) Utility Charge

Annual power consumption for lighting is estimated at 890 KWH (warehouse), 760 KWH (office bldg.) and 76 KWH (instrument house) and for water pump 1,300 KWH.

The charge will be

$$(890 + 760 + 76 + 1,300) \times 0.13 \text{ MK} = 393 \text{ MK/Year}$$

The total of the above six items makes about 15,000 MK, but the maintenance cost for Bangula Depot will not increase this amount in full.

At present the maize transfer to and from vehicles do not use conveyors, and measurement is done bag by bag in the course of stacking, necessitating at least another ten workers per line to carry bags. Besides, the practical capacity of the job line is assumed to be 70% of the new system, so the total number of manpower must be 2.5 times.

The details of jobs in Bangula Depot differ item by item to be handled, and as no analysis data is available, estimation is made for the cost of handling maize as follows:

Manpower cost for workers	$3,816 \times 2.5 = 9,540$	MK
Maint. & repair of stackers	$72,500 \times 0.4\% = 2,900$	
Electricity for stackers		540
Utility (power for water)		420
		<hr/>
		13,400 MK

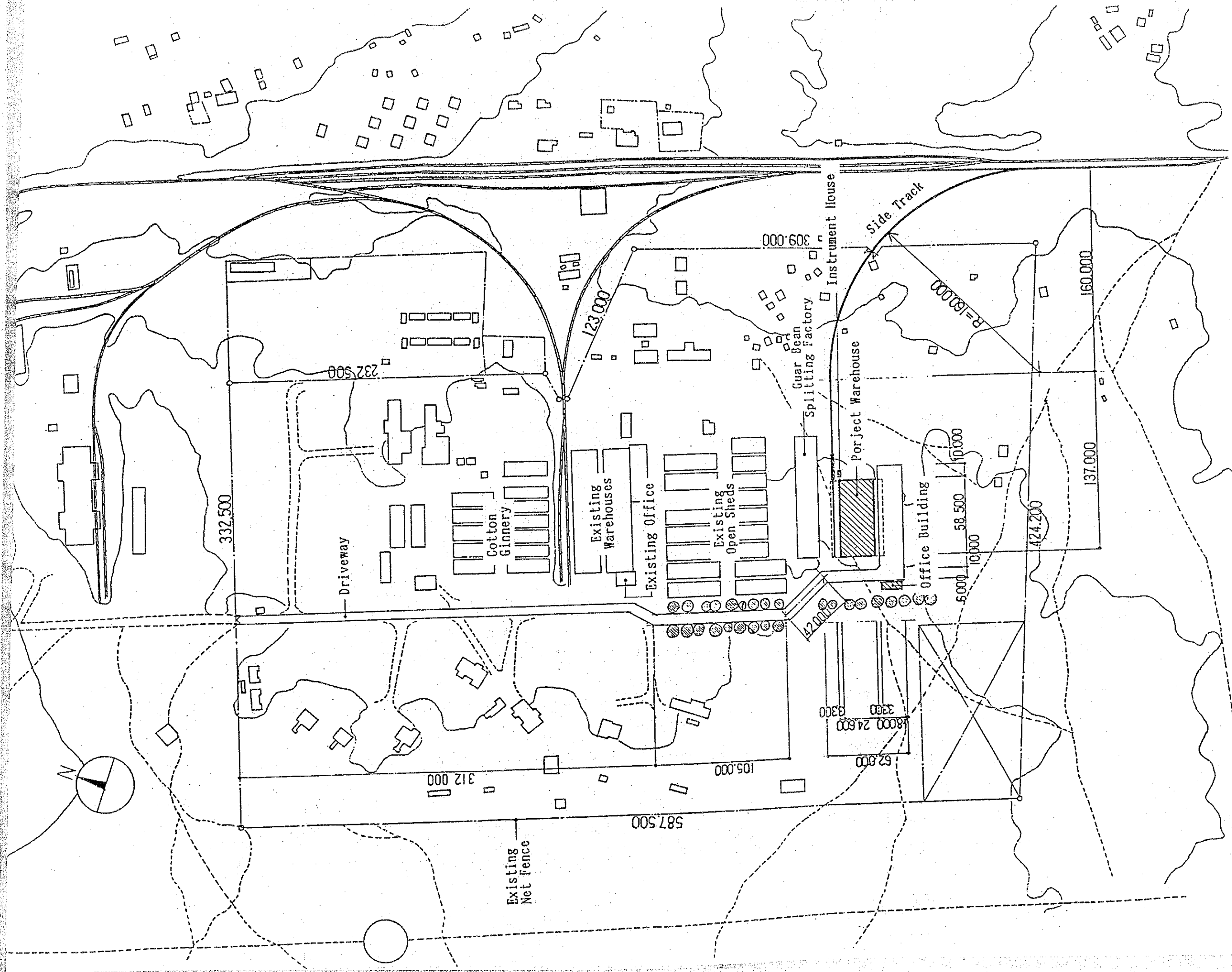
The balance from foregoing 15,000 MK makes 1,600 MK, which is presumed as the substantial increase of the annual expense.

It corresponds to only 0.4% of the total cost for Bangula Depot (385,000 MK in 1986/87), of which 56.6% is occupied by manpower cost.

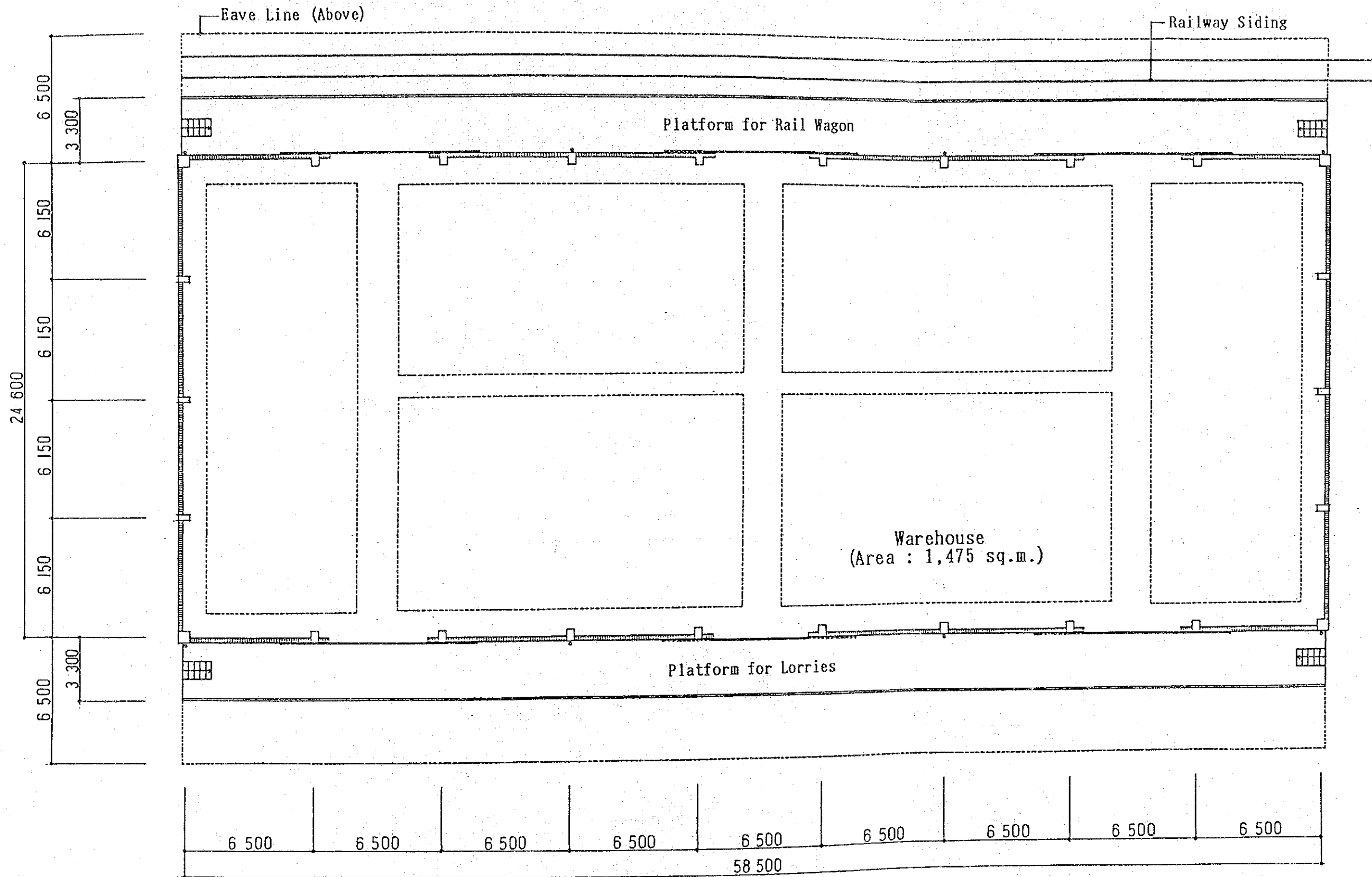
4-7 Approximate Budget Estimated

Main expenses estimated for the scope to be borne by the Malawi side are given below for the sake of reference.

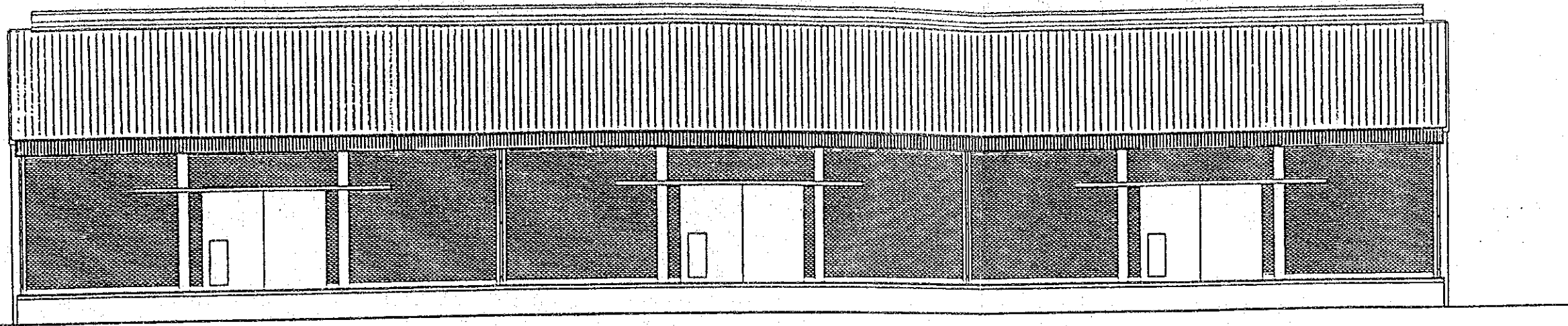
1) Site clearance and levelling	24,200 MK
2) Removal or transfer of site lighting	-
3) Telephone installations	100
4) Furniture and utensils	2,000
5) Banking charges	7,200
	<hr/>
	33,500 MK



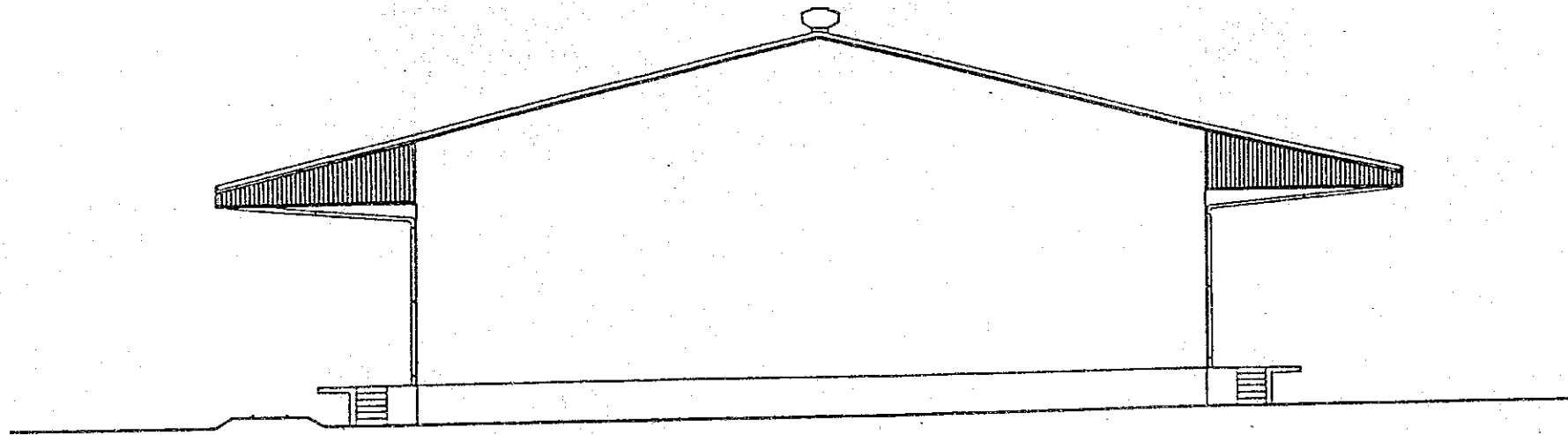
SITE LAYOUT PLAN S = 1/2,500



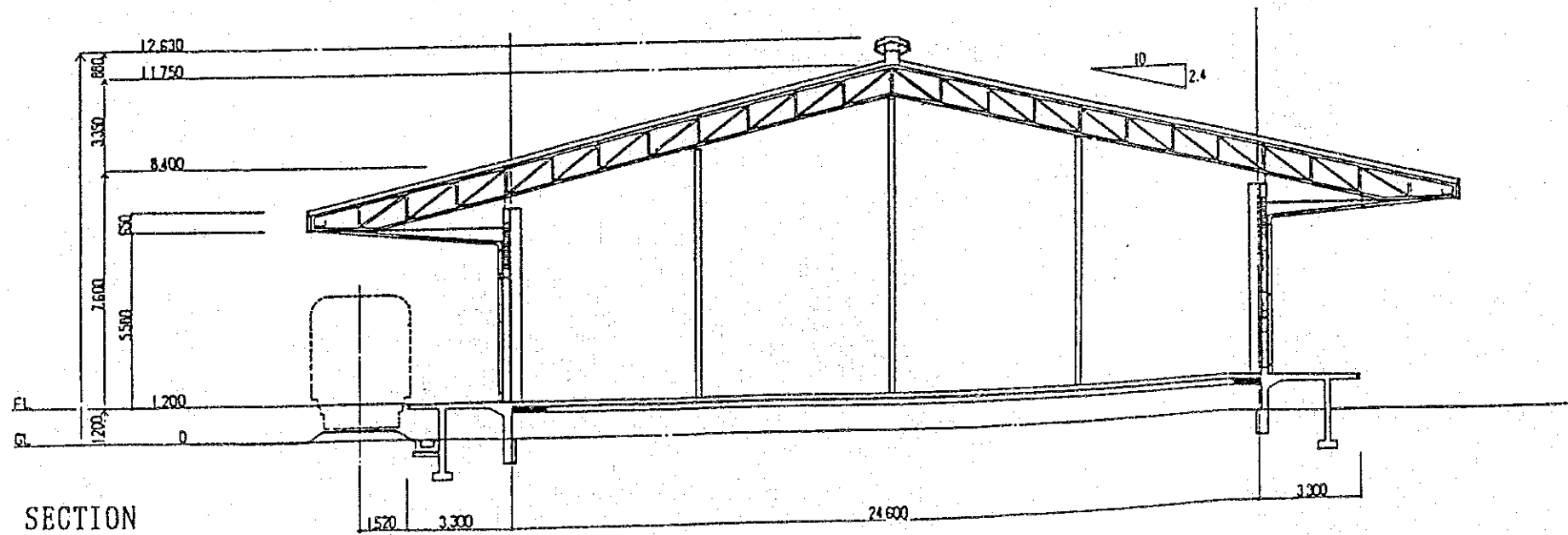
WAREHOUSE - PLAN S = 1/200



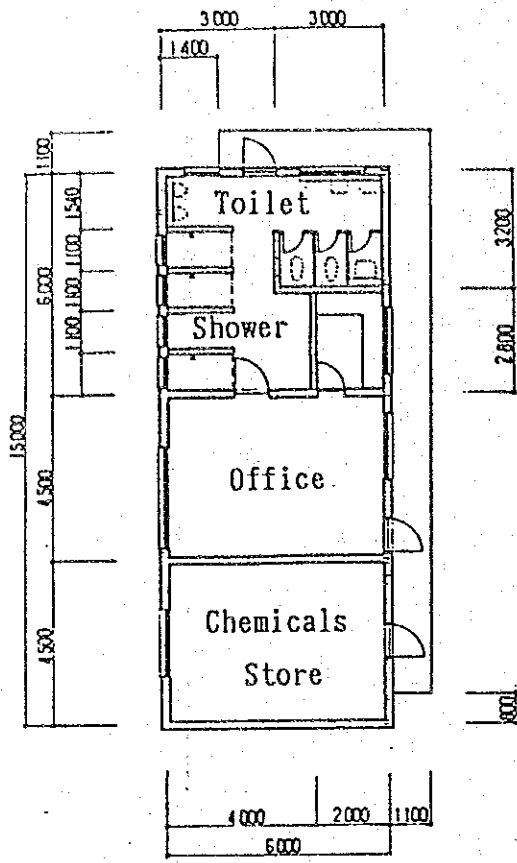
SOUTH ELEVATION



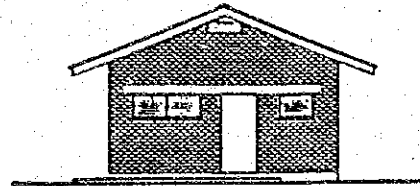
WEST ELEVATION



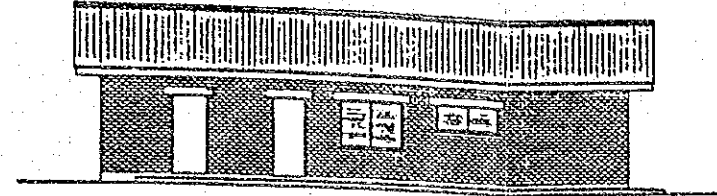
SECTION



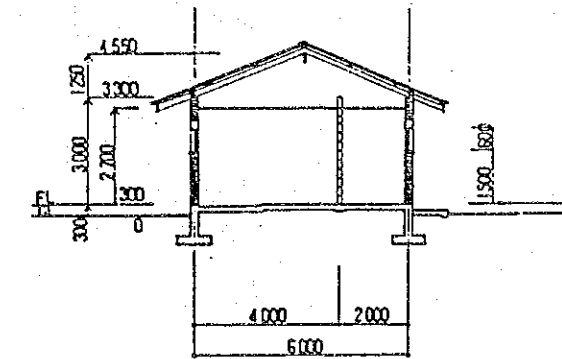
PLAN



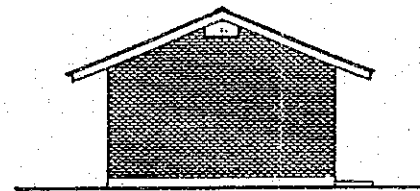
NORTH ELEVATION



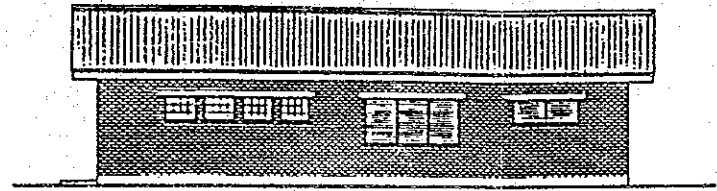
EAST ELEVATION



SECTION

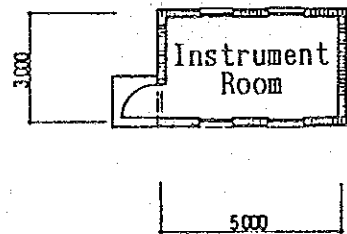


SOUTH ELEVATION



WEST ELEVATION

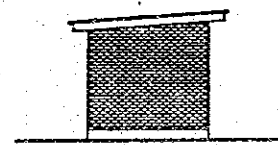
OFFICE BUILDING - PLAN ELEVATION SECTION S = 1/200



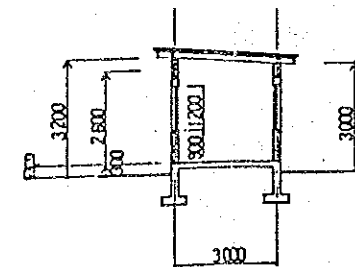
PLAN



NORTH ELEVATION



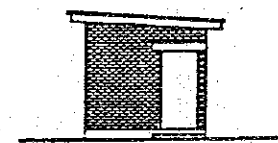
EAST ELEVATION



SECTION



SOUTH ELEVATION



WEST ELEVATION

INSTRUMENT HOUSE - PLAN ELEVATION SECTION S = 1/200

CHAPTER 5: Project Evaluation

This project is planned as one part of the agricultural product warehouse restructuring plan of the Republic of Malawi, with the purpose of establishing a system of stable supply of maize to Ngabu, a food shortage area, through the construction of the ADMARC Bangula Depot warehouse located in the southern part of the country.

Since maize is the staple food for Malawian people, the project's aim of developing a stable supply satisfies the conditions for grant aid. As the project costs to be borne by the Malawi side are nominal, the present organization and personnel will suffice for the execution of the project, and no remarkable changes in maintenance and administration expenses will result from the current burden, the project is practical.

The new warehouse is given consideration to rational and smooth goods handling work and is designed with adequate ventilation, lighting, heat insulation and moisture prevention and with the construction to prevent the entry of birds, rats and other vermin.

It is hoped that this facility, together with other equipment provided under the grant aid for goods handling and storage, will be effectively utilized under adequate management, so that it will contribute to a stable supply of good quality and sanitary maize and to help elevate the welfare of the people of Malawi.

CHAPTER 6: Conclusion and Recommendations

This is a project to establish a stable food supplying system at the Ngabu area in the southern part of Malawi, by building a warehouse which can hold 3,700 tons of maize in the compound of ADMARC Bangula Depot in this area. The building, its ancillary equipment, and the equipment for handling and storing goods will be in the scope, and it is quite appropriate to implement this project under the grant aid system. The new warehouse constructed in this project can hold the necessary amount of maize through-out the year. It is a general understanding to hold cotton outside, since cotton is picked during the dry season, and this way of handling will also be applied in this project. According to the analysis, it is possible to keep the products in the existing facility, if cotton ginning and handling is made without delay. It is also possible to solve the problem about guar beans utilizing the store space in the existing building which accommodates a splitting plant. For the remaining items, they can be covered by the existing facilities. Re-building of the present facilities is not yet necessary. In conclusion, building a new 3,700 tons warehouse in accordance with this project is the only required action to the proposal.

The lower reaches of Shire River including Bangula is the main production site of cotton and that area is located at the most suitable position to ship them out to Port Beira in Mozambique. That was the reason why a cotton ginnery was constructed here at that time. The route to Beira for export is now closed and the extra amount of cotton for export has been decreased because of the increase of domestic consumption. These are the reasons why the ginnery does not have to be in Bangula. The products of ginned cotton should be shipped out as soon as possible to Blantyre which is the next destination with better climate. The current huge outside stacks of cottonseed will be solved by improving the management condition. Moving the cotton ginnery to Blantyre in the future will form a factory complex with spinning and oil manufacturing factory together. This will present a desirable prospect from the national and economic point of view.

APPENDIX-I Members List and Itinerary of the Field Survey Team

1-1 Members of the Team

<u>Name</u>	<u>Team Status & Affiliation</u>
ISHIDA, Seigoh	Team Leader The Food Agency, Ministry of Agriculture, Forestry & Fisheries
OHYE, Tetsuo	Project Coordinator Japan International Cooperation Agency (JICA)
SHIRAI, Kazunari	Chief Engineer Nippon Sogo Architects & Engineers (NSK)
SHIRAI, Akira	Architectural Designer Nippon Sogo Architects & Engineers (NSK)
YAMAZAKI, Isamu	Post-harvest Planner Overseas Merchandise Inspection Co. (OMIC)

1-2 Itinerary of the Team

Field survey was done in the thirty five days from February 28th to April 2nd, 1988.

<u>Date</u>	<u>Day</u>	<u>Activity</u>
Feb. 28	Sun.	Lv. Tokyo, Ar. London
29	Mon.	Lv. London
Mar. 1	Tue.	Ar. Nairobi, meeting at JICA Kenya Office and at Embassy of Japan
2	Wed.	Lv. Nairobi, Ar. Lilongwe
3	Thu.	(National Holiday) Meeting within the team

<u>Date</u>	<u>Day</u>	<u>Activity</u>
4	Fri.	Courtesy call to Ministry of Agriculture (MOA) and Ministry of Finance, technical visit to Lilongwe silo, move to Blantyre
5	Sat.	Meeting within the team
6	Sun.	Survey of the proposed site at Bangula
7	Mon.	Meeting with ADMARC (inception report, survey schedule, etc.), technical visit to Limbe depot
8	Tue.	Meeting with ADMARC (hearing of the Malawi side's plan), survey at Bangula depot (warehousing)
9	Wed.	Meeting with ADMARC (contents of the Project), data collection at National Statistical Office and Department of Printing
10	Thu.	Move to Lilongwe, discussion with MOA
11	Fri.	Signing of Minutes of Discussions at MOA
12	Sat.	(Ishida and Ohye) Lv. Lilongwe to Tokyo
13	Sun.	Move to Mzuzu, visiting Benga Market and Nkhata Bay Market on the way
14	Mon.	Technical visit to Mzuzu Katoto warehouse construction site and move to Lilongwa, visiting Mzimba Market on the way
15	Tue.	Meeting with MOA (K. Shirai and Yamazaki) move to Blantyre
16	Wed. - 18 Fri.	(K. Shirai and Yamazaki) Data collection at ADMARC (A. Shirai) Data collection at MOA and Ministry of Works & Supplies, move to Blantyre
19	Sat.	Survey at Bangula depot (measurement)
20	Sun.	Review of collected data and making tentative plan of facilities

<u>Date</u>	<u>Day</u>	<u>Activity</u>
21	Mon.	Data collection at Bangula depot and visit Malawi Railways
22	Tue.	Meeting with ADMARC (facility plan), data collection at Malawi Railways
23	Wed.	Data collection at ADMARC, survey on construction material cost
24	Thu.	Meeting with ADMARC (building capacity and equipment plan)
25	Fri.	Meeting with ADMARC (building capacity), survey on transportation conditions
26	Sat.	Review of collected data, survey on construction material cost
27	Sun.	Supplementary survey of the proposed site at Bangula
28	Mon.	Visit ADMARC and JICA Office to report the result of survey
29	Tue.	Move to Lilongwe and visit MOA to bid farewell
30	Wed.	Visit Alimounde Depot, Lv. Lilongwe, Ar. Nairobi
31	Thu.	Visit JICA Kenya Office and Embassy of Japan to report the result of survey
Apr. 1	Fri.	Lv. Nairobi
2	Sat.	Ar. Tokyo via London

11th March, 1988

MINUTES OF DISCUSSIONS
ON
THE PROJECT FOR THE MULTI-PURPOSE
AGRICULTURAL WAREHOUSE CONSTRUCTION
IN THE REPUBLIC OF MALAWI

In reponse to the request made by the Republic of Malawi for assistance in constructing the multi-purpose agricultural warehouse at Bangula (hereinafter referred to as "the Project"), The Government of Japan has sent through Japan International Cooperation Agency (JICA), a Study Team headed by Mr. Seigoh Ishida, Assistant Director of Inspection Division, the Food Agency, Ministry of Agriculture, Forestry and Fisheries, from February 28th to March 10th, 1988.

The team held a series of discussions and exchanged views with the relevant authorities of the Government of the Republic of Malawi. As the result of the survey and discussions, both parties agreed to recommend to their respective governments to examine the major points of understanding reached between them, herewith attached, toward the realization of the Project.

石田 清剛

SEIGOH ISHIDA

Leader of the Japanese
Basic Design Study Team

R.R. SEMU

R.R. SEMU

for: PRINCIPAL SECRETARY
MINISTRY OF AGRICULTURE

H.S. MONONGA

for: SECRETARY TO THE TREASURY

ATTACHMENT-1 : MAJOR POINTS OF UNDERSTANDING

1. The objective of the Project is to provide a multi-purpose agricultural warehouse with appropriate storage capacity at Bangula, for the Agricultural Development and Marketing Corporation (ADMARC).
2. The Government of Malawi has requested to construct multi-purpose warehouses with total capacity of 30,000 tonnes at Bangula initiating with the storage capacity of 10,000 tonnes as the first stage, although it previously proposed in their request letter, 48,000 tonnes as the total and 8,000 tonnes as the first stage.
3. The Japanese Study Team confirmed, through the site survey and several discussions, the necessity of construction of a multi-purpose agricultural warehouse at Bangula.
4. The optimum layout, scale and the storage capacity will be formulated in Japan after analysing collected data and information, and it will be proposed in the Basic Design Study Report.
5. Equipment necessary for the operation of the warehouse will be considered and taken up under the Grant Aid.
6. Under the control of the Ministry of Agriculture, ADMARC is the overall execution and implementing agency for the Project and assumes responsibility for the management, operation and maintenance of the warehouse.
7. The Japanese Study Team will convey the request of the Government of the Republic of Malawi to the Government of Japan, that the latter will extend Grant Aid for the construction of the multi-purpose agricultural warehouses at Bangula within the scope of the Japanese economic cooperation in Grant Form.
8. The Government of Malawi has confirmed to take the necessary measures as listed in ATTACHMENT-2 on condition that the Grant Aid for the execution of the Project is extended by the Government of Japan.
9. The Japanese Study Team explained the system of Japan's Grant Aid and it was fully understood by the Government of Malawi.

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6

ATTACHMENT-2 : REQUIRED ARRANGMENT TO BE UNDERTAKEN BY THE
GOVERNMENT OF THE REPUBLIC OF MALAWI

1. To secure the land necessary for construction of the facilities and to clear, fill and level the site as needed before commencement of construction.
2. To construct gates and fences in and around the site and to construct the access road to the site when needed.
3. To provide facilities for distribution of electricity, water supply and drainage to their connection points within the site.
4. To provide other incidental facilities such as telephone system, furniture, etc., if deemed necessary.
5. To bear the advising commission of Authorization to Pay (A/P) and the payment commission to the Japanese foreign exchange bank for the banking service based upon the Banking Arrangement (B/A).
6. To ensure prompt unloading, tax exemption and custom clearance of the products at the port of disembarkation in Malawi and to extend the convenience for internal transportation of construction materials and equipment purchased under the Grant.
7. To accord without delay to Japanese nationals whose services may be required in connection with the Project under the verified contracts such as facilities as may be necessary for their entry into Malawi and their stay therein for the performance of their work.
8. To exempt Japanese nationals engaged in the Project from custom duties, internal taxes and other fiscal levies which may be imposed in Malawi with respect to the supply of the products and services under the verified contracts.
9. To maintain and use properly and effectively the facilities constructed and equipment purchased under the verified contracts.
10. To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as the transportation and installation of the equipment.
11. To provide space necessary for such construction as temporary offices, working areas, stock yards, etc.
12. To ensure that temporary electricity supply and water supply are made available for the construction and incidental activities relative to the Project.

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APPENDIX-III Member List and Itinerary of the Draft Report
Explanation Team

3-1 Members of the Team

<u>Name</u>	<u>Team Status & Affiliation</u>
ISHIDA, Seigoh	Team Leader
SHIRAI, Kazunari	Chief Engineer
YAMAZAKI, Isamu	Post-harvest Planner

3-2 Itinerary of the Team

Explanation of the Draft Report was carried out in the fourteen days from July 10th to July 23rd, 1988.

<u>Date</u>	<u>Day</u>	<u>Activity</u>
Jul. 10	Sun.	Lv. Tokyo, Ar. Paris
11	Mon.	Lv. Paris
12	Tue.	Ar. Lilongwe
13	Wed.	Visit Ministry of Finance and Ministry of Agriculture (MOA) to explain the draft report, move to Blantyre
14	Thu.	Visit ADMARC Regional Office (South) to explain the draft report, survey on Chikwawa cotton ginnery and Bangula depot
15	Fri.	Visit JICA Office, explanation of the draft report at ADMARC Headquarters
16	Sat.	Collection and review of data
17	Sun.	Holiday
18	Mon.	Visit Limbe depot, visit JICA Office to report the result of meeting, move to Lilongwe
19	Tue.	Report to MOA
20	Wed.	Signing of Minutes of Discussions at MOA, Lv. Lilongwe, Ar. Nairobi

<u>Date</u>	<u>Day</u>	<u>Activity</u>
21	Thu.	Visit JICA Kenya Office and Embassy of Japan to report the result of explanation
22	Fri.	Lv. Nairobi
23	Sat.	Ar. Tokyo via London

MINUTES OF DISCUSSIONS

THE DRAFT REPORT OF THE BASIC DESIGN STUDY
ON THE PROJECT FOR
THE MULTI-PURPOSE AGRICULTURAL WAREHOUSE CONSTRUCTION
IN THE REPUBLIC OF MALAWI

At the request of the Government of the Republic of Malawi for grant aid on the Project for the Multi-purpose Agricultural Warehouse Construction at Bangula (hereinafter referred to as "the Project"), the Government of Japan decided to conduct a Basic Design Study (hereinafter referred to as "the Study") on the Project and the Japan International Co-operation Agency (JICA) sent the study team headed by Mr. Seigoh Ishida, Assistant Director of Inspection Division the food agency, Ministry of Agriculture, Forestry and Fisheries from February 28th to April 2nd, 1988.

As a result of the study and discussions, JICA prepared a Draft Final Report on the Study and dispatched a Mission to explain and discuss the Report starting from July 10th to July 23rd, 1988.

Both parties held a series of discussions on the Report and agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined toward the realization of the Project.

July 20th, 1988


SEIGOH ISHIDA

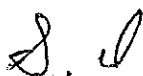
Leader of the Japanese
Basic Design Study Team


B.M. NDISALE

Principal Secretary
Ministry of Agriculture

MAJOR POINTS OF UNDERSTANDING

1. The Malawi side has agreed in principle to the basic design proposed in the Draft Final Report.
2. The Malawi side believes the original proposal of a multi-purpose storage facility should still be subject to further study by the Japanese Government. This is in view of the expected expansion of agricultural output.
3. The Malawi side understood the system of Japan's Grant Aid Programme and confirmed the arrangement to be taken by the Malawi side for realization of the Project.
4. The Final Report (15 copies in English) on the Project will be submitted to the Malawi side by October, 1988.



APPENDIX-V List of Concerned Persons

MINISTRY OF AGRICULTURE

B. M. Ndisale	Principal Secretary
R. R. Semu	Deputy Secretary
M. J. K. Mughogho	Principal Economist (Planning Division)
M. Y. Sawerengera	Senior Economist
Sichinga	Principal Statistician
T. Mubvundula	Statistician (Planning Division)
Z. T. Soko	Chief Planning Officer
R. Chingura	Secretary (Planning Division)
E. Ntokotha	Deputy Chief Agricultural Officer
Malowa	Principal Administrative Officer

MINISTRY OF FINANCE

Muanonga	Senior Assistant Secretary
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AGRICULTURAL DEVELOPMENT & MARKETING CORPORATION (ADMARC)

E. B. Salifu	Assistant General Manager (Primary Marketing)
K. P. V. Gondwe	Assistant General Manager (Sales)
W. C. J. Horrea	Depot & Market Controller
D. M. Harawa	Chief Accountant
O. G. O. Ndovi	Senior Project Liaison Officer
Moyo	Transport & Storage Controller
Mdachi	Senior Training Officer
A. P. Kapusa	Senior Assistant Accountant
E. P. Msewo	Senior Building Supervisor
G. R. Mlia	Regional Manager (South)
C. A. Banda	Accountant, Regional Office (South)
B. V. J. Jedegwa	Accountant, Regional Office (South)
M. B. Corner	Statistics Supervisor, Regional Office (South)
Z. J. Z. Nyirenda	Divisional Supervisor (Ngabu)
Chikafa	Depot Supervisor (Limbe)
C. D. Jere	Depot Supervisor (Bangula)
Y. E. Barton	Depot Supervisor (Mzuzu)
Mzembe	Market Supervisor (Benga)
D. W. L. Gunde	Pest Controller (Limbe)
Chirwa	Assistant Pest Controller (Bangula)

MINISTRY OF WORKS & SUPPLIES

G. Clark	Personal Secretary
Mervvin M. Matenda	Chief Architect
Brickle	Chief Quantity Surveyer
B. W. Zingano	Regional Controller of Works (South)

DEPARTMENT OF PRINTING, STATIONERY AND OFFICE EQUIPMENT (Zomba)

M. E. Mukiwa	Government Printer
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MALAWI RAILWAY LTD.

Frank. W. Ntonya	Assistant General Manager
E. R. Limbe	Chief Civil Engineer

OTHERS

Alfred G. Scherer	Chief Technical Advisor for ADMARC UNDP/FAO Technical Assistant Project
B. D. Mwaungulu	Chief Accountant, National Oil Industries Ltd.
Tom T. Msowoya	Chartered Quantity Surveyor, Fitzsimons Northcrofts Associates
Andy Thompson	General Manager, Press Transport (1975) Ltd.
Thomas J. Keusters	General Manager, AMI Press (Malawi) Ltd.
Bruce Currie	Commercial Manager, AMI Press (Malawi) Ltd.
Hiroyuki Matsumura	Staff Officer, World Food Programme Malawi Office

JAPANESE EMBASSY (Kenya)

Yoshimitsu Nishitani	First Secretary
Ichiro Nagame	First Secretary

JICA KENYA OFFICE

Kenji Kumagishi	Resident Representative
Seiji Kaiho	Assistant Resident Representative
Masayoshi Juro	Assistant Resident Representative

JICA MALAWI OFFICE

Mutsumi Narawa	Resident Representative, JICA Marawi Office
Shuji Ono	JOCV Co-ordinator

APPENDIX-VI. Reference Material Collected by the Study Team

1. Map of Malawi 1:1,000,000 1987
2. School Atlas for Malawi 1987
3. Tourist Road Map Malawi 1986
4. Malawi in Figures 1986
5. Malawi Yearbook 1982
6. Malawi Population Census 1987 (Analytical Report volume I / volume II)
7. Report of Seminar on the Analysis of the 1977 Malawi Population Census and its Utilization in Development Planning
8. Malawi Statistical Yearbook 1985
9. Malawi Population Census 1977 (Nsanje District)
10. Monthly Statistical Bulletin November 1987
11. National Sample Survey of Agriculture 1980/81
12. Report of Seminar on National Sample Survey of Agriculture 1980/81
13. Transport Statistics 1985
14. Economic Report 1987
15. Annual Economic Survey 1980-1981
16. Financial Statement 1987/88
17. Financial Statement 1986/87
18. Budget Estimate and Performance Report on Treasury Funds 1987/88
19. National Accounts Handbook Sources and Methods 1985
20. Public Sector Financial Statistics 1984-85
21. Employment and Earnings Annual Report 1983-85
22. Fifteenth Annual Report of the Commissioner of Taxes 1982
23. Standard Specification for Road and Bridge Works 1978
24. Climatological Tables for Malawi 1982
25. Laws of Malawi : Architects & Quantity Surveyors
26. Laws of Malawi : Carriage by Air
27. Laws of Malawi : Cotton
28. Laws of Malawi : Customs & Excise
29. Laws of Malawi : Electricity
30. Laws of Malawi : Employment
31. Laws of Malawi : Engineers
32. Laws of Malawi : Farmers' Stop-order
33. Laws of Malawi : Fertilizers, Farm Feeds & Remedies
34. Laws of Malawi : Inland Waters Shipping
35. Laws of Malawi : Insurance
36. Laws of Malawi : Malawi Certificate Examination & Testing Board
37. Laws of Malawi : Regulation of Minimum Wages & Conditions of Employment
38. Laws of Malawi : Road Traffic
39. Laws of Malawi : Special Crops
40. Laws of Malawi : Taxation

APPENDIX-VII. Reference Data

I. SMALL HOLDER CROP PRODUCTION

SMALL HOLDER CROP PRODUCTION (Metric Tonnes)

Year	Maize	Rice	Ground Nuts	Tabacco	Cotton	Guar Beans	Sorghum	Millet	S. Potatoes	Cassava	Pulses
1983/84	11,700 1,397,963	4,250 34,486	90 54,766	0 18,272	13,650 29,842	2,700 2,750	11,600 14,271	4,000 8,316	1,200 59,926	1,890 258,693	1,482 29,479
1984/85	20,170 1,355,205	3,833 34,302	188 62,240	0 20,515	20,640 46,106	3,600 3,600	17,128 22,041	5,460 10,580	2,800 81,047	1,060 209,321	2,293 28,132
1985/86	21,240 1,294,564	3,127 37,407	339 88,297	0 16,117	15,915 36,235	2,300 2,300	16,100 20,761	4,900 9,526	4,200 80,003	3,080 218,282	2,282 39,099
1986/87	15,666 1,201,757	2,948 28,632	232 88,073	0 13,650	11,940 20,957	1,680 1,680	11,214 14,542	2,830 8,666	4,000 121,195	11,000 169,403	3,666 56,803
1987/88	23,124 1,367,707	3,243 31,314	163 66,210	0 7,877	18,564 29,286	3,150 3,243	13,582 18,472	3,258 6,833	8,346 32,288	4,170 118,226	3,260 51,679
Average	18,380 1,323,436	3,480 33,268	226 71,917	0 15,286	16,142 32,485	2,686 2,715	13,929 18,017	4,490 8,784	4,109 74,892	4,240 194,785	2,597 41,038

Ngabu ADD (Chikwawa & Nsanje Districts)	1983/84	3rd Crop Estimates
Total (whole country)	1984/85	3rd "
	1985/86	3rd "
	1986/87	3rd "
	1987/88	1st "

Source: Data Base, Ministry of Agriculture

2. ADMARC Markets under Ngabu Divisional Office (1987/88)

Parent Market	Nos. of Unit Market		
	total	permanent	temporary
1. NSANJE	14	6	8
2. MAKHANGA	9	8	1
3. MAKANDE	18	9	9
4. NBEWE	7	5	2
5. CHIKWAWA	7	5	2
6. KALANBO	8	5	3
total	63	38	25

Source: ADMARC Regional Office (South)

3 . STAFFS AND LABOURERS OF BANGULA DEPOT

Staffs and Labourers of Bangula Depot

Permanent	Nos.	Temporary	Nos.
Depot Supervisor	1	Clerks for seed cotton	18
Assistant Depot Supervisor	1	Clerks for cotton seed	—
Depot Control Supervisor (Assistant)	1	Staffs for dressing cotton seed	2
Transport Supervisor	1	Clerks for dressing cotton seed	2
Pest Control Operators	8	Sub-total	about 20
Weighbridge Operators	2		
Depot Clerk	1	General Workers	about 500
General Clerk	1		
Wages Clerk	1		
Records Clerk	1		
Typist Clerk	1		
Telephone Operator	1		
Depot Cashier	1		
Scale Clerks	2		
Tally Clerks	5		
Depot Foreman	1		
Assistant Depot Foreman	1		
Tractor Drivers	4		
Stack Machine Attendant	1		
Water Pump Attendants	2		
Watchmen	12		
Capitao (group leader)	1		
Messengers	3		
Garden Boys	3		
Cooks	3		
Sanitary Men	3		
General Workers	3		
Sub-total	65		

Source: ADMARC Bangla Depot, Mar. 1988

4. QUANTITY AND VALUE OF ADMARC PURCHASES BY COMMODITY

QUANTITY OF ADMARC PURCHASES BY COMMODITY

Period	ADMARC DOMESTIC PURCHASES (Tonnes)										(2) Other
	Total	Tobacco	Groundnut		Seed Cotton	Rice Paddy	Maize		Pulses		
			Shelled				Shelled				
1980	192,959	11,341	31,418	23,114	17,498	91,888	10,596	7,104			
1981	215,850	12,755	19,494	21,739	14,582	136,647	7,202	3,331			
1982	302,452	8,794	10,432	14,800	12,543	246,062	5,731	4,030			
1983	291,905	9,279	10,218	13,368	8,503	244,937	3,185	2,416			
1984	376,253	19,162	9,867	32,122	9,771	296,292	5,573	3,466			
1985	372,991	20,823	18,235	32,711	10,735	271,567	17,042	1,869			
1986	242,988	17,170	33,068	21,011	12,125	112,639	25,393	1,588			
1987	163,461	18,122	44,829	21,363	7,656	59,466	11,132	899			

VALUE OF ADMARC PURCHASES BY COMMODITY

Period	ADMARC DOMESTIC PURCHASES (K'000)										(2) Other
	Total	Tobacco	Groundnut		Seed Cotton	Rice Paddy	Maize		Pulses		
			Shelled				Shelled				
1980	29,254	4,792	9,689	5,036	1,769	6,083	1,280	605			
1981	27,752	5,418	5,976	4,647	1,470	9,053	877	311			
1982	41,698	4,433(1)	3,408	3,982	1,367	27,284	732	492			
1983	43,777	6,873	3,077	4,858	1,080	27,119	478	292			
1984	72,754	15,619	5,695	12,870	1,528	35,573	1,019	450			
1985	87,859	20,619	12,375	14,205	1,631	33,247	5,222	337			
1986	90,048	16,970	38,595	10,017	2,336	13,703	7,899	529			
1987	76,988	18,589	32,700	11,205	1,709	8,712	3,751	328			

(1) Includes bonuses paid to local farmers.

(2) Mainly Sunflower seed, Coffee, Cassava and other miscellaneous produce.

SOURCE: Agricultural Development and Marketing Corporation

5. ADMARC DEPOT LIST AND STORAGE CAPACITY

ADMARC Depot List and Storage Capacity in Ton

<u>No.</u>	<u>Depot</u>	<u>Storage Capacity</u>
<u>South Region</u>		
1	Limbe (1)	6,400
2	Midima Road	1,000
3	Bangula	10,000
4	Luchenza	18,230
5	Balaka (1) (2) (3)	24,800
6	Lambulira (MK5 & MK8)	3,500
7	Liwonde	3,230
8	Lirangwe (transit)	400
9	Chikwawa	897
10	Livilidzi	6,400
11	Nchalo	1,152
12	Charterland (1) (2)	20,400
13	Transit (3) Shed	14,040
14	Fert. Shed (4)	3,500
15	Sedi (5)	12,690
16	Kalinde	1,228.8
17	Namenga	4,000
18	Nasawa	4,000
19	Luana	1,076
20	Zomba (MK8)	2,500
Sub-total		139,443.8
<u>Central Region</u>		
1	Lilongwe (1) (2) (3)	14,580
2	Salima	43,680
3	Nkhotakota	1,879
4	Alimaunda (1) (2) (3) (4)	63,307
5	Silo Complex Lilongwe	180,000
6	Malangalansa	19,874
Sub-total		323,320
<u>Nothern Region</u>		
1	Mzuzu (1) (2) (3)	2,158
2	Chilumba	348
3	Kazomba	-
4	Nkhotabay	1,224
5	Ipyana	Nil
6	Ngara	1,248
7	Kapolo	307
8	Karonga	648
9	Mbawa	648
10	Mzimba 1 & 2, MK8	2,884
11	Rumphi	1,300
12	Bungano	270
Sub-total		11,035
Grand Total		473,798.8

6. MONTHLY COLLECTING RATE OF AGRICULTURAL PRODUCE IN NGABU ADD

Crop	%											
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Seed Cotton	0.1	14.6	37.4	32.5	13.5	1.9	0	0	0	0	0	0
Rice Paddy	—	0.1	3.0	53.9	20.5	4.9	6.8	0	6.3	4.1	0.4	—
Maize Shelled	5.8	17.2	4.1	35.5	31.1	6.1	0.2	0	0	0	0	0
Sorghum	2.1	4.2	18.4	55.6	14.3	5.4	0	0	0	0	0	0
Guar Bean	0	3.4	9.2	45.5	38.7	3.1	0.1	0	0	0	0	0
Pulses	—	1.0	8.6	12.0	12.7	11.2	37.9	16.3	0.3	0	0	0
Castor-Oil	0	0	0.4	9.3	27.9	15.8	18.9	27.7	—	0	0	0
Sesame	0	0	18.6	32.2	31.6	17.5	0.1	0	0	0	0	0
Groundnut Shelled	0	0.3	15.2	39.5	27.3	14.7	0.4	2.6	0	0	0	0

Note: 1988/89 projected

Source: ADMARC Regional Office (South)

7. QUANTATIVE SUMMARY OF ADMARC PURCHASES BY CROP IN NGABU ADD

Quantitative Summary of ADMARC Purchases by Crops in Ngabu ADD (Chikwava and Nsanje Districts)

Crop	Unit: kg						Average
	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	
Seed Cotton	0	6,285,833	12,751,374	12,172,612	8,839,267	11,731,791	8,630,146
Paddy Rice	681,474	354,599	1,311,577	1,234,865	1,064,955	478,706	854,363
Maize	3,255,139	9,096	2,106,269	831,995	57,735	268,821	1,088,176
Sorghum	279,477	0	195,521	49,564	636	0	87,533
Millet	0	0	175	0	0	0	29
Ground Nuts	2,557	2,016	6,214	9,973	54,086	4,544	13,232
Beans	19,045	0	10,157	6,456	12,417	645	8,120
Peas	261,838	202	312,232	834,115	2,331,141	54,200	632,288
Grams	2,503	243	14,987	49,104	97,149	10,073	29,010
Castor	18,400	0	33,506	9,062	5,093	483	11,091
Sesame	337	80	913	761	9,367	20,130	5,265
Guar Beans	3,761,718	1,927,217	2,817,906	1,223,541	2,056,443	1,267,554	2,175,730
Chillies	0	3	8	0	50	0	10
Cashew Nuts	1,195	0	0	0	0	0	199
Sun Flower	0	0	0	0	381	1,037	236
Total	8,283,683	8,579,269	19,560,839	16,422,048	14,528,720	13,837,984	13,535,428

Source: ADMARC Regional Office (South)

8. LINT PRODUCTION BY BANGULA COTTON GINNERY

Year	Lint	Cotton Seed	Unit: kg
			Seed Cotton
1981/82	6,978,960	14,169,403	21,148,363
1982/83	4,710,600	9,563,945	14,274,545
1983/84	4,008,240	8,137,942	12,146,182
1984/85	10,169,280	20,646,719	30,815,999
1985/86	9,207,720	18,694,461	27,902,181
1986/87	5,160,420	10,477,216	15,637,636
1987/88	5,829,840	11,836,341	17,666,181
Average	6,580,723	13,360,861	19,941,582

(36,560 bales)

N.B. Cotton seed and seed cotton were estimated from the lint production under the ratio as follows:

Seed cotton	100%
- Lint	33%
Cotton seed	67%

Source: ADMARC Bangula Depot

9. MAIZE SALES UNDER NGABU DIVISIONAL OFFICE ADMARC

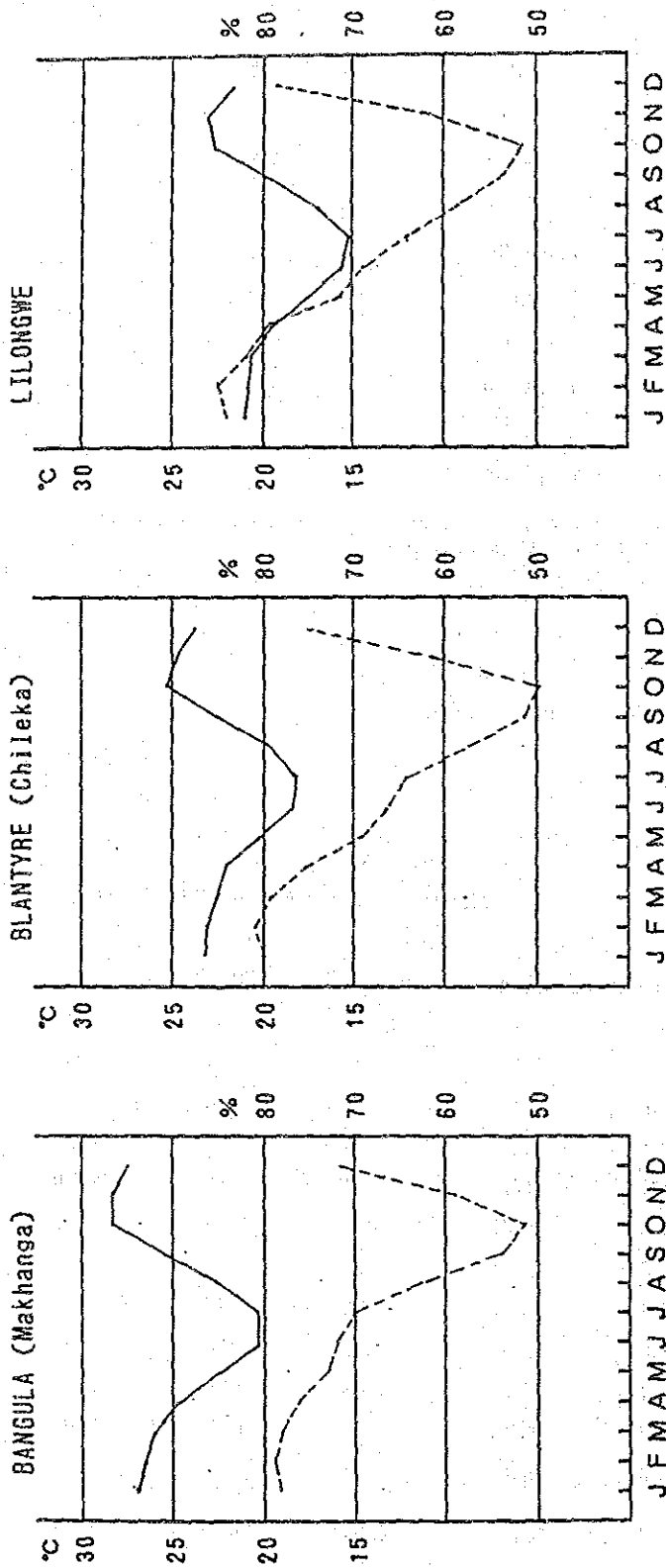
Maize Sales Under Ngabu Divisional Office ADMARC, 1982/83-1987/88

Month	Maize Sales Under Ngabu Divisional Office ADMARC, 1982/83-1987/88						ton
	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	Average
April	258	468	280	50	185	504	290
May	90	1,069	77	379	478	651	458
June	49	2,148	237	442	871	422	695
July	214	2,064	273	507	1,177	239	746
August	157	3,019	660	1,790	2,509	622	1,458
September	183	2,502	604	1,240	2,100	158	1,131
October	375	3,104	631	1,723	3,093	490	1,569
November	403	2,816	641	1,477	3,443	2,021	1,800
December	878	3,337	599	3,913	3,239	1,661	2,271
January	1,647	4,351	999	2,889	3,537	1,426	2,475
February	1,595	3,538	886	1,937	2,371	772	1,850
March	978	6,169	727	650	1,266	n.a.	1,958
Total	6,827	34,585	6,614	16,997	24,269	8,966	16,701

Source: ADMARC Regional Office (South)

10. CLIMATIC DATA AT RELATED PLACES

MEAN TEMPERATURE AND RELATIVE HUMIDITY (Daily Means)



Source: Meteorological Services, Malawi

1 1 . MODEL CALCULATION OF WAREHOUSING AT BANGULA DEPOT

(a) Seed Cotton				(ton)
month	opening	incoming	outgoing	balance
APR	0	20	0	20
MAY	20	2,911	0	2,931
JUN	2,931	7,458	4,200	6,189
JUL	6,189	6,481	4,200	8,470
AUG	8,470	2,692	4,200	6,962
SEP	6,962	379	4,200	3,141
OCT	3,141	0	3,141	0
NOV	0	0	0	0
DEC	0	0	0	0
JAN	0	0	0	0
FEB	0	0	0	0
MAR	0	0	0	0
total	-----	19,941	19,941	-----

(a-1) L i n t				(ton)
month	opening	incoming	outgoing	balance
APR	1,081	0	550	531
MAY	531	0	531	0
JUN	0	1,386	550	836
JUL	836	1,386	550	1,672
AUG	1,672	1,386	550	2,508
SEP	2,508	1,386	550	3,344
OCT	3,344	1,037	550	3,831
NOV	3,831	0	550	3,281
DEC	3,281	0	550	2,731
JAN	2,731	0	550	2,181
FEB	2,181	0	550	1,631
MAR	1,631	0	550	1,081
total	-----	6,581	6,581	-----

(a -2a) Cotton Seed for Next Planting				(ton)
month	opening	incoming	outgoing	balance
APR	0	0	0	0
MAY	0	0	0	0
JUN	0	0	0	0
JUL	0	780	0	780
AUG	780	1,560	1,560	780
SEP	780	1,560	1,560	780
OCT	780	780	1,560	0
NOV	0	0	0	0
DEC	0	0	0	0
JAN	0	0	0	0
FEB	0	0	0	0
MAR	0	0	0	0
total	-----	4,680	4,680	-----

(a - 2b) Cotton Seed for Oil (ton)

month	opening	incoming	outgoing	balance
APR	0	0	0	0
MAY	0	0	0	0
JUN	0	2,814	1,900	914
JUL	910	2,814	1,900	1,048
AUG	1,048	2,814	1,656	402
SEP	402	2,814	1,324	0
OCT	0	2,104	0	0
NOV	0	0	0	0
DEC	0	0	0	0
JAN	0	0	0	0
FEB	0	0	0	0
MAR	0	0	0	0
total	-----	13,360	8,680	-----

(c) Guar Beans (ton)

month	opening	incoming	outgoing	balance
APR	0	0	0	0
MAY	0	74	74	0
JUN	0	200	200	0
JUL	0	990	480	510
AUG	510	842	480	872
SEP	872	68	480	460
OCT	460	2	462	0
NOV	0	0	0	0
DEC	0	0	0	0
JAN	0	0	0	0
FEB	0	0	0	0
MAR	0	0	0	0
total	-----	2,176	2,176	-----

JICA