

**STUDY REPORT  
ON  
THE PROJECT FOR  
IMPROVEMENT OF EXPANDED PROGRAMME  
ON IMMUNIZATION  
IN  
THE REPUBLIC OF MALAWI**

**JUNE 2001**

**JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)**

<b>GR2</b>
<b>CR1</b>
<b>01-250</b>

## PREFACE

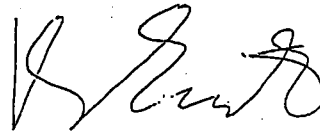
In response to a request from the Government of the Republic of Malawi, the Government of Japan decided to conduct a basic design study on the Project for Improvement of the Expanded Programme on Immunization and entrusted the Japan International Cooperation Agency (JICA) to conduct the study with the assistance of the Japan International Cooperation System (JICS).

JICA sent to Malawi a study team from February 22 to March 12, 2001.

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

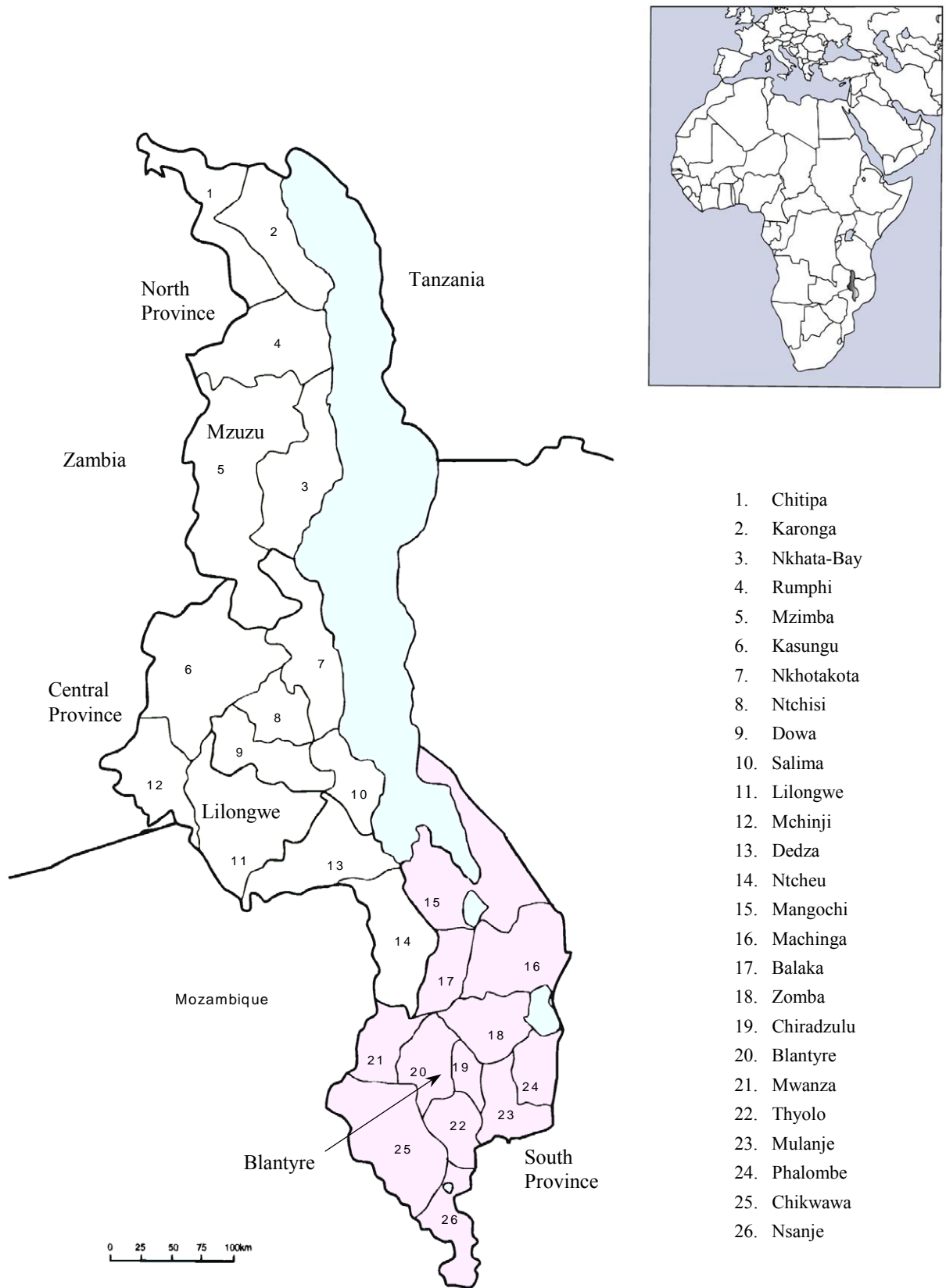
I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Malawi for their close cooperation extended to the team.

June 2001



Kunihiko Saito  
President

Japan International Cooperation agency



1. Chitipa
2. Karonga
3. Nkhata-Bay
4. Rumphi
5. Mzimba
6. Kasungu
7. Nkhatakota
8. Ntchisi
9. Dowa
10. Salima
11. Lilongwe
12. Mchinji
13. Dedza
14. Ntcheu
15. Mangochi
16. Machinga
17. Balaka
18. Zomba
19. Chiradzulu
20. Blantyre
21. Mwanza
22. Thyolo
23. Mulanje
24. Phalombe
25. Chikwawa
26. Nsanje

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## Abbreviations

AfDB	Africa Development Bank
AFP	Acute Flaccid Paralysis
A/P	Authorization to Pay
BCG	Bacille de Calmette et Guerin
BHN	Basic Human Needs
CHAM	The Christian Hospital Association of Malawi
DFID	Department for International Development
DPT	Absorbed Diphtheria-Purified Pertussis-Tetanus Combined Vaccine
EPI	Expanded Program on Immunization
GAVI	Global Alliance for Vaccines and Immunization
GNP	Gross National Product
GTZ	Deutsche gesellschaft fur Technische Zusammenarbeit
HSA	Health Surveillance Assistant
IDA	International Development Association
ICC	Inter Agency Coordinating Committee
KfW	Kreditanstalt Fur Wiederaufbaut,
MCH	Maternal and Child Health
NGO	Non-Government Organization
NID	National Immunization Day
PHC	Primary Health Care
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
4WD	4 Wheel Drive

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## Chapter 1 Background of the Project

The Ministry of Health and Population (MHP) of the Republic of Malawi (hereinafter to be referenced as "Malawi") formulated a Malawi Expanded Program on Immunization for the purpose of improving the children's health, which is the subject with the highest priority in the present health sector, and plans to replace the deteriorated cold chain and delivery equipment and procure the equipment of presently insufficient quantity in order to increase the immunization rate. However the budgetary measures of the Malawi government and the cooperation from other donors are insufficient, which have caused defects in the immunization activities. Under these circumstances, the government of Malawi requested the Japanese government for the procurement of necessary equipment. The requested contents are shown in Table 1-1.

The said sector studied the present state and the defects of health and medical field of Malawi in the development study of the FY 1997 entitled the "Study of the Primary Health Care Reinforcement Project". In the FY 2000, it studied the immunization activities of Malawi in the Project Formulation Study (health and medical field) in which it indicated deterioration and lack of equipment.

Table 1-1 Contents of the request from Malawi

No.	Item	Q'ty	No.	Item	Q'ty
<b>A. Cold Chain</b>			<b>B. Logistics</b>		
<b>1) National Storage Level</b>			L-1	Refrigerator Truck	3
CC-1	Icelined Refrigerator and/or Freezer	10	L-2	Pickup Truck	10
<b>2) District Level</b>			L-3	Motorecycle	20
CC-2	Icepack Freezer	54	L-4	Bicycle	650
CC-3	Icelined Refrigerator & Icepack Freezer	120	<b>Others</b>		
CC-4	Cold box	200	CC-12	Spare Parts	
CC-5	Refrigerator & Icepack Freezer (Solar)	120	CC-13	Technical Training	
CC-6	Voltage Regulator for Compression Refrigerators	100			
CC-7	Voltage Regulator for Absorption Refrigerators	350			
CC-8	Tool Kit	60			
<b>3) Health Center Level</b>					
CC-9	Refrigerator & Icepack Freezer (Electricity and Gas)	350			
CC-10	Refrigerator & Icepack Freezer (Electricity and Kerosene)	300			
CC-11	Vaccine Carrier	2,500			

## **Chapter 2 Contents of the Project**

### 2-1 Basic Concept of the Project

The MHP of Malawi has the goal to increase the total immunization rate to 90% and achieve the eradication of poliomyelitis and neonatal tetanus by 2005 in order to reduce the high morbidity and mortality of infants from the diseases that can be prevented, and treated as one of the most important subjects of its upper level projects. In relation to the above mentioned goal, the Project has the objectives to reinforce the immunization activities all over Malawi and improve the immunization rate by replacing the deteriorated cold chain equipment, procuring the vehicles for delivery of vaccines as well as installing the equipment insufficient in number in the health and medical facilities of Malawi. In order to achieve these objectives, the Project shall procure the cold chain equipment and delivery vehicles to the health and medical facilities of Malawi. With the effective use of the procured equipment, the Project shall contribute to the improvement of health and hygiene of the entire country of Malawi by promoting the prevention and treatment of diseases.

### 2-2 Basic Design of the Requested Japanese Assistance

#### 2-2-1 Design policy

The Project shall design the distribution plan of cold chain equipment, vaccine delivery vehicles, and immunization activity vehicles necessary for the improvement of the vaccine supply system of all over Malawi for the purpose of implementing the proper immunization activities based on the request from the Malawi government.

##### i Basic policy

The Project shall cover the entire country of Malawi including Northern, Central, and Southern provinces and the 26 districts governed by the three provinces.

The target facilities of the Project shall be three provincial vaccine warehouses, 26 district health offices, and 636 health centers. Each facility shall select its necessary equipment.

##### 1) Items to be procured

###### A) Cold chain equipment

###### a) For the provincial vaccine warehouses

The existing icelined refrigerators and/or freezers for vaccine storage which have operating defects due to defective and/or deterioration shall be replaced. The cold boxes to transport the



vaccines from provincial vaccine warehouses to district health offices shall be procured in the quantity required to make up for the insufficiency.

b) For the district health offices

The cold boxes used for the transportation of vaccines from the district health offices to health centers shall be procured in the quantity to make up for the insufficiency. In order to cope with the insufficient manufacturing ability of icepacks necessary for transporting vaccines at proper temperature, the icepack freezers for this purpose shall also be procured.

c) For health centers

The defective and deteriorated small refrigerators to store vaccines shall be replaced and the equipment insufficient in number shall be supplemented. By considering the infrastructure of each area, the equipment proper for the site situation shall be planned. Electric and gas refrigerators, icepack freezers shall be procured for the areas with gas supply facility and electric and kerosene refrigerators and icepack freezers shall be procured for the areas with no gas supply facility as a rule. The facilities in the remote agricultural areas have no electricity and have difficulty in obtaining stable supply of vaccines and fuels (gas and kerosene) due to the road situation during the rainy season. Therefore these facilities are forced to stop the immunization activities for a long period of time. For this reason, the MHP is examining the introduction of solar power system to the facilities under the above mentioned situation all over the country in the future. The Project shall select the target areas and procure the solar refrigerators and icepack freezers by considering the maintenance ability of the MHP.

The vaccine carriers used for the transportation of vaccines to the outreach clinics shall also be procured sufficient number to make up for the insufficiency.

In order to cope with the unstable power supply situation, which is considered the main cause of defect, the voltage regulators shall be procured for the refrigerators.

B) Vehicles

The existing vehicles which are significantly deteriorated shall be replaced and the vehicles which are insufficient in number shall be procured as a rule. The vehicles shall be distributed to the provincial vaccine warehouses and the district health offices in accordance with the objectives for using vehicles.

a) For the provincial vaccine warehouses

Cargo trucks shall be procured for the provincial vaccine warehouses for the purpose of delivering vaccines and equipment from the Central vaccine warehouse to the provincial

vaccine warehouses and from the provincial vaccine warehouses to the district ones. The details of the utilization plan are shown in Table 2-1.

Table 2-1 Utilization plan for cargo trucks

Equipment to be distributed to Northern province

	Activities	Place of operation	Frequency	No. of days to operate in a year	Travel distance	Annual travel distance
1	Delivery of vaccines and syringes	1 place	4 times a year	8 days (2 days for 1 operation)	Average of 300 km (one-way)	2,400 km
2	Shipping of vaccines and syringes	5 places (provinces)	12 times a year (once a month)	120 days (2 days for 1 operation)	Average of 130 km (one-way)	15,600 km
3	Delivery and shipping of cold chain equipment	Ditto	As necessary	Conducted at the same time as Item 2.		
4	Delivery and shipping of defective equipment	As necessary	24 times (2 times a month)	48 days (2 days for 1 operation)	Average of 130 km (one-way)	6,240 km
				176 days		24,240 km

Equipment to be distributed to Central province

	Activities	Place of operation	Frequency	No. of days to operate in a year	Travel distance	Annual travel distance
1	Delivery of vaccines and syringes	1 place	4 times a year	4 days	Average of 30 km (one-way)	240 km
2	Shipping of vaccines and syringes	9 places (provinces)	12 times a year (once a month)	156 days (1 to 2 days for 1 operation)	Average of 90 km (one-way)	19,440 km
3	Delivery and shipping of cold chain equipment	Ditto	As necessary	Conducted at the same time as Item 2.		
4	Delivery and shipping of defective equipment	As necessary	24 times (2 times a month)	48 days (2 days for 1 operation)	Average of 90 km (one-way)	4,320 km
				208 days		24,000 km

Equipment to be distributed to Southern province

	Activities	Place of operation	Frequency	No. of days to operate in a year	Travel distance	Annual travel distance
1	Delivery of vaccines and syringes	1 place	4 times a year	8 days (2 days for 1 operation)	Average of 300 km (one-way)	2,400 km
2	Shipping of vaccines and syringes	12 places (provinces)	12 times a year (once a month)	192 days (1 to 2 days for 1 operation)	Average of 80 km (one-way)	23,040 km
3	Delivery and shipping of cold chain equipment	Ditto	As necessary	Conducted at the same time as Item 2.		
4	Delivery and shipping of defective equipment	As necessary	24 times (2 times a month)	48 days (2 days for 1 operation)	Average of 80 km (one-way)	3,840 km
				248 days		29,280 km

b) For the district health offices

One pickup truck shall be procured for each district with no operating vehicle at present for the delivery of vaccines, equipment, and fuels from the district vaccine warehouse to the health centers.

The details of utilization plan are shown in Table 2-2.

Table 2-2 Utilization plan for pickup trucks

	Activities	Place of operation	Frequency	No. of days to operate in a year	Travel distance	Annual travel distance
1	Delivery of vaccines and syringes	Average of 25 places	12 times a year (1 time in a month)	60 days (5 places at 1 time)	Average of 100 km	6,000 km
2	Delivery of fuels (gas and/or kerosene)	Ditto	Ditto	Conducted at the same time as Item 1.		
3	Supervision and monitoring	Ditto	Ditto	60 days (5 places at 1 time)	Average of 100 km	6,000 km
4	Immunization educational activities	Ditto	Ditto	Ditto	Average of 100 km	6,000 km
5	Regular inspection of equipment	Ditto	Ditto	Ditto	Average of 100 km	6,000 km
6	Repair of equipment	As necessary	As necessary	Conducted at the same time as Item 5.		
				240 days		24,000 km

Note: The immunization educational activities include notification of the immunization day to residents, publicity for immunization activities, promotion of the participation of residents not visiting the immunization spot on the immunization day, and confirmation of the births of neonates.

The motorcycles used for the mobile immunization at remote areas and the monitoring activity shall be distributed to the district health offices with insufficient number of operating motorcycles so that they can be used effectively for the immunization activities by the health offices or the health centers as necessary.

The details of the utilization plan are shown in Table 2-3.

Table 2-3 Utilization plan for motorcycles

	Activities	Place of operation	Frequency	No. of days to operate in a year	Travel distance	Annual travel distance
1	Mobile immunization activity	Average of 5 places	5 days a week	250 days	Average of 20 km (one-way)	10,000 km
2	Delivery of vaccines and syringes	Ditto	Ditto	Conducted at the same time as Item 1.		
3	Monitoring and immunization educational activity	Ditto	1 time a week	50 days	Average of 20 km (one-way)	1,000 km
				300 days		11,000 km

Note: Mobile immunization means the immunization of the residents in the areas with difficulty of access to health centers or immunization for residents with difficulties in visiting the immunization spots.

### C) Repair tools

The repair tools (wrench set and screwdriver set) shall be procured for three provincial vaccine warehouses and 26 district health offices for the easy repair of refrigerators and vehicles.

## 2) Procurement quantity

The planned quantity and the reason for estimation are shown in Table 2-4.

Table 2-4 Reason for estimating the equipment

No.	Item	Q'ty	Procurement Plan	Reason
1	Icelined Refrigerator and/or Freezer	10	Northern province vaccine storage: 2 Central vaccine storage : 5 Southern province vaccine storage : 3	To replace the 10 icelined refrigerators and/or freezers that are not operating due to defective or deterioration among the 54 existing ones at the provincial vaccine storage warehouses
2	Icepack Freezer	54	26 vaccine storage warehouses of district health offices: 2 (3 freezers to Lilongwe and Blantyre districts with large population)	District health offices do not have icepack freezers and need at least 2 icepack freezers for each warehouse.
3	Refrigerator & Icepack Freezer (Electricity and Gas)	250	To replace 179 refrigerators and icepack freezers and procure 71 refrigerators and icepack freezers for the district health centers	Among the existing 215 refrigerators and icepack freezers of the district health centers mainly in Southern province that are using gas refrigerators at present or the ones that do not have electricity and plan to use gas refrigerators, 179 refrigerators and icepack freezers that are in defective and/or deteriorated at present shall be replaced and 71 refrigerators and icepack freezers shall be procured for the health centers with no refrigerator or icepack freezer.
4	Refrigerator & Icepack Freezer (Electricity and Kerosene)	175	To replace 153 refrigerators and icepack freezers of the district health centers and procure 22 refrigerators/freezers for the health centers with no equipment at present	In some of the areas of the Northern province where a gas supply system is not provided, 153 refrigerators and icepack freezers are difficult to operate due to defects and/or deterioration. Of the existing equipment, 267 will be replaced and 22 refrigerators and icepack freezers shall be procured for the health centers with none at present
5	Refrigerator & Icepack Freezer (Solar)	15	3 health centers of 5 districts (Karonga, Nkhotakota, Balaka, Nsanje, and Phalombe)	Solar refrigerator and icepack freezers shall be procured for the health centers in the remote areas with no electricity or the areas with difficulty in obtaining stable fuel supply due to the situation of access roads and so on in the following 5 districts. 1. At least one candidate area shall be selected in the 3 provinces of Northern, Central, and Southern provinces. 2. The remote areas of the above mentioned 3 provinces (Karonga, Nkhotakota, and Balaka) where stable supply of fuels is not possible because the access roads are not prepared 3. The area where the traffic is closed due to floods and so on (Nsanje) 4. The remote area in the mountainous region (Phalombe)
6	Cold Box	75	Vaccine warehouses in 3 provinces: 44 Lilongwe: 31	The cold boxes shall be used for delivering vaccines from the provincial vaccine warehouses to district health offices and from the district health offices to the health centers. As the minimum necessary quantity, 78 cold boxes shall be necessary for the vaccine warehouses in 3 provinces and estimated as follows: no. of provinces x 3 = 78. 636 cold boxes for district health offices and estimate as follows: no. of health centers x 1 = 636. Altogether 714 cold boxes shall be needed. Therefore the difference of the number of cold boxes between the ones to be procured and the number of existing ones is 198. The requested quantity of 200 was obtained by adding 2 spare cold boxes to the above mentioned difference of 198. However, 125 cold boxes shall be supplied by some donors through the UNICEF. The Project shall procure the remaining 75 cold boxes and distribute them to the provincial vaccine warehouses and Lilongwe.
7	Vaccine Carrier	2,000	To procure an average of 5 vaccine carriers for each health center.	Vaccine carriers are necessary for the transportation of vaccines and examination samples from the health centers to the outreach clinics. The minimum necessary number is obtained as follows: 5 vaccine carriers for each health center (Each health center has an average of 5 outreach clinics: 2,690/636) and altogether 3,185 vaccine carriers are needed. Therefore the difference in the number of vaccine carriers and the existing ones is 2,020. The Project shall distribute a total of 2000 vaccine carriers to each district in the necessary quantity.
8	Voltage Regulator A	64	To procure 1 voltage regulator for each electric refrigerator mentioned in Items 1 and 2 (province and district)	It is necessary to cope with the power situation which is considered to be causing problems. For the compressor refrigerators

9	Voltage Regulator B	100	To procure 1 voltage regulator for each health center with electric supply	It is necessary to cope with the power situation considered to be causing defective. For the absorption refrigerators A minimum of 1 voltage regulator shall be installed in the 112 health centers with electric supply. In Lilongwe with better power situation than other districts, voltage regulators shall be installed for 6 out of 18 facilities.
10	Tool Kit	29	To distribute 1 tool kit to each district health office and for each of Northern, Central, and Southern provinces.	For the repair of the equipment such as refrigerators and bicycles To be distributed to 29 facilities of 3 provinces and 26 districts
11	Cargo Truck	3	To procure 1 cargo truck for each vaccine warehouse in Northern, Central, and Southern provinces.	Used for delivering the equipment such as vaccines and refrigerators from the provincial vaccine warehouses to the vaccine warehouses of the district health offices.
12	Pickup Truck	10	To procure 1 pickup truck for each of 10 district health offices	One pickup truck shall be procured for 10 districts with no operating pickup truck at present due to defects and/or deterioration for the expanded program on immunization (EPI) activity of each district health office as follows: Northern province; 3 districts of Chitipa, Karonga, and Nkhata-Bay, Central province; 4 districts of Kasungu, Nkhonkhotakota, Mchinji, and Nicheu districts, Southern province; 3 districts of Balaka, Phalombe, and Nsanje
13	Motorcycle	21	To procure 1 motorcycle for each of the 21 district health offices	One motorcycle shall be distributed to each of the 26 districts with operating motorcycles of less than 5, which is the minimum required number for mobile immunization and so on, and due to defects, deterioration, and/or an insufficient number for the EPI activities of the district health offices as follows: 21 out of 26 districts excluding Rumphu (Northern province), Lilongwe (Central province), and Zomba, Mwanza, and Chikawawa (Southern province).

#### ii. Natural conditions

Main roads are paved relatively well, but most of the access roads to the health centers are unpaved. Especially during the rainy season, access to the health centers is difficult. Therefore the specifications shall take these conditions into account (4 WD vehicle and off-road motorcycle). The vehicles shall have covers because it rains heavily during the rainy season.

#### iii. Social conditions

It is difficult to say if the electric situation has improved even in urban areas. Most of the areas throughout the country have facilities with no electric supply. The facilities with no electricity use LP gas and kerosene as the substitute energy. For these facilities, gas, kerosene, and/or solar refrigerators/freezers must be procured according to the situation of each area. Even those with electrical facilities, power failure occurs frequently and the voltage fluctuates significantly. For this reason, voltage regulators are necessary from the standpoint of preventing the breakdown and deterioration of equipment.

#### iv. Operation and maintenance ability of the implementation agency

The equipment shall be selected from the types that are generally used in Malawi at present and measures shall be taken so that the engineers can maintain the equipment easily. For some equipment, spare parts shall be procured in the amount needed at the initial stage. The vehicles shall be procured based on the types which are available to the local agents since continuous procurement of spare parts and repair instructions are necessary. The manufacturers shall provide sufficient explanation on the use and the maintenance method of the equipment when

delivering the equipment.

v. Quality of equipment

The cold chain equipment shall conform to the quality standard specified by the WHO for the EPI equipment. The type of vehicles shall be selected based on the road situation and the existing vehicles in Malawi.

vi. Procurement method and the delivery period

As Malawi is an inland country, the equipment shall be transported by land from the main harbors of nearby countries. For this reason, smooth loading and transportation are required in the countries where the equipment is transported. The Project period shall be a single year because the Project shall procure the standard equipment.

2-2-2 Basic Plan (Equipment Plan)

The main specifications, quantity, and the purpose of using the equipment to be procured by the Project are shown in Table 2-5.

Table 2-5 Contents of the equipment

No.	Item	Specifications	Amount	Purpose
1	Icelined Refrigerator	Compression, storage capacity ap.160L	10	For the storage of vaccines
2	Icepack Freezer	Compression, storage capacity ap.140pcs icepack	54	For manufacturing icepacks
3	Refrigerator & Icepack Freezer (Electricity and Gas)	Electricity and Gas, storage capacity ap. 50L	250	For the storage of vaccines
4	Refrigerator & Icepack Freezer (Electricity and Kerosene)	Electricity and Kerosene, storage capacity ap. 50L	175	For the storage of vaccines
5	Refrigerator & Icepack Freezer (Solar)	Solar system, Storage capacity ap. 60L	15	For the storage of vaccines
6	Cold Box	Long range, storage capacity ap. 8L, weight ap.20kg	75	For the transportation of vaccines
7	Vaccine Carrier	AP. 2Liters	2,000	For the transportation of vaccines
8	Voltage Regulator A	for Compression Refrigerators	64	For constant-voltage
9	Voltage Regulator B	for Absorption Refrigerators	100	For constant-voltage
10	Tool Kit	for general use	29	For the repair of refrigerators and bicycles
11	Cargo Truck	4×2, Diesel, AP. 3tons payload	3	For the transportation of vaccines
12	Pickup Truck	Double Cabin, 4WD, Diesel	10	For the transportation and monitoring of vaccines
13	Motorcycle	Off Road type, 125cc	21	For the transportation and monitoring of vaccines

The initial request from Malawi included bicycles. However as the UNICEF is going to procure 1,000 bicycles for each health center in 2001, bicycles are excluded from the Project.

Procurement of freezer vehicles to deliver vaccines was changed to cargo trucks considering the population and the national land area of Malawi as well as the maintenance situation.

The distribution plan of the equipment by the Project is shown in Table 2-6.

Table 2-6 Distribution plan of the equipment

	Item	Icclined Refrigerator	Icepack Freezer	GAS Refrigerator	Kerosene refrigerator	Solar Refrigerator	Cold Box	Vaccine Carrier	Voltage Regulator A	Voltage Regulator B	Tool Kit	Cargo Truck	Pickup Truck	Motorcycle	
	Qty	10	54	250	175	15	75	2000	64	100	29	3	10	21	
<b>Northern regional</b>															
1	Chitipa	DHO	2						2		1		1	1	
		Hearth center			12			85							
2	Karonga	DHO	2						2		1		1	1	
		Hearth center			8	3		50		1					
3	Nkhata-Bay	DHO	2						2		1		1	1	
		Hearth center			26			115		3					
4	Rumphi	DHO	2						2		1				
		Hearth center			11			50		3					
5	Mzimba	DHO	2						2		1			1	
		Hearth center			21			185		6					
	Vaccine store		2				13		2		1	1			
<b>Central regional</b>															
6	Kasungu	DHO	2						2		1		1	1	
		Hearth center			12			95		4					
7	Nkhotakota	DHO	2						2		1		1	1	
		Hearth center		1	6	3		55		2					
8	Ntchisi	DHO	2						2		1			1	
		Hearth center		2	7			10							
9	Dowa	DHO	2						2		1			1	
		Hearth center			15			65		2					
10	Salima	DHO	2						2		1			1	
		Hearth center			8			70		4					
11	Lilongwe	DHO	3				31		3		1				
		Hearth center			27	9		190		6					
12	Mchinji	DHO	2						2		1		1	1	
		Hearth center		3	7			40		2					
13	Dedza	DHO	2						2		1			1	
		Hearth center			25			40		2					
14	Ntcheu	DHO	2						2		1		1	1	
		Hearth center			20	5		100		1					
	Central vaccine store		5				25		5		1	1			
<b>Southern regional</b>															
15	Mangochi	DHO	2						2		1			1	
		Hearth center			21			120		7					
16	Machinga	DHO	2						2		1			1	
		Hearth center			27			50		5					
17	Balaka	DHO	2						2		1		1	1	
		Hearth center			6	7	3	40		2					
18	Zomba	DHO	2						2		1				
		Hearth center			4	6		80		6					
19	Chiradzulu	DHO	2						2		1			1	
		Hearth center			12			30		5					
20	Blantyre	DHO	3						3		1			1	
		Hearth center			25			130		12					
21	Mwanza	DHO	2						2		1				
		Hearth center			11			30		2					
22	Thyolo	DHO	2						2		1			1	
		Hearth center			18	4		130		11					
23	Mulanje	DHO	2						2		1			1	
		Hearth center			7	7		65		6					
24	Phalonde	DHO	2						2		1		1	1	
		Hearth center			7	4	3	25		0					
25	Chikwawa	DHO	2						2		1				
		Hearth center			17			95		3					
26	Nsanje	DHO	2						2		1		1	1	
		Hearth center			17		3	55		5					
	Vaccine store		3				6		3		1	1			
	Total		10	54	250	175	15	75	2000	64	100	29	3	10	21

As for the cold chain equipment, products conforming to the quality standard specified by the WHO for the EPI equipment shall be procured. However because these products are not

manufactured in Japan, they must be procured from the third countries. The countries from which the main equipment will be procured are shown in Table 2-7.

Table 2-7 Countries from which the main equipment will be procured

No.	Item	Malawi	Japan	Third country
1	Icelined Refrigerator and/or Freezer			○
2	Icepack Freezer			○
3	Refrigerator & Icepack Freezer (Electricity and Gas)			○
4	Refrigerator & Icepack Freezer (Electricity and Kerosene)			○
5	Refrigerator & Icepack Freezer (Solar)			○
6	Cold Box			○
7	Vaccine Carrier			○
8	Voltage Regulator A			○
9	Voltage Regulator B			○
10	Tool Kit		○	
11	Cargo Truck		○	
12	Pickup Truck		○	○
13	Motorcycle		○	

2-2-3 Implementation plan

2-2-3-1 Implementation policy

The Project shall procure the equipment according to the procedure shown below. The countries qualified for supplying the equipment are Malawi, Japan, and other third countries. For procurement, a general open tender shall be conducted and a lump-sum contract shall be made by a Japanese company as the contractor. The preloading inspection of procured equipment shall be entrusted to a third party inspection agency.

The procured equipment shall be delivered and distributed to the target facilities by the EPI unit as the implementation agency.

2-2-3-2 Implementation conditions

As the equipment shall be transported by land from nearby countries (Durban Harbor in South



Africa or Beira Harbor in Mozambique), attention must be paid to the situation of the countries where transportation is carried out. The transportation route from the above-mentioned harbors has experienced less frequent robberies than other routes (Tanzania) based on past results. As the equipment procured by the Project shall be transported in containers, except for vehicles, they have less chances of being robbed.

2-2-3-3 Scope of works

The obligations borne by Japan and Malawi are as follows.

Country	Contents
Japan	Procurement of equipment Equipment transportation up to the delivery place (Lilongwe city)
Malawi	Equipment distribution from the place where the equipment is delivered by the Japanese party until the target facilities Installation of solar refrigerators and/or freezers

With regard to the obligations of Malawi, the equipment was distributed without any problem from previous support from other donors. Therefore, the equipment shall be distributed without any problem under the Project. For the installation of solar refrigerators and/or freezers, cooperation of the UNICEF will be obtained.

2-2-3-4 Consultant supervision

One procurement contractor shall be dispatched from Japan as a local procurement supervisor for implementing the acceptance inspection and the delivery of equipment to be procured in Malawi in accordance with the delivery period for the equipment.

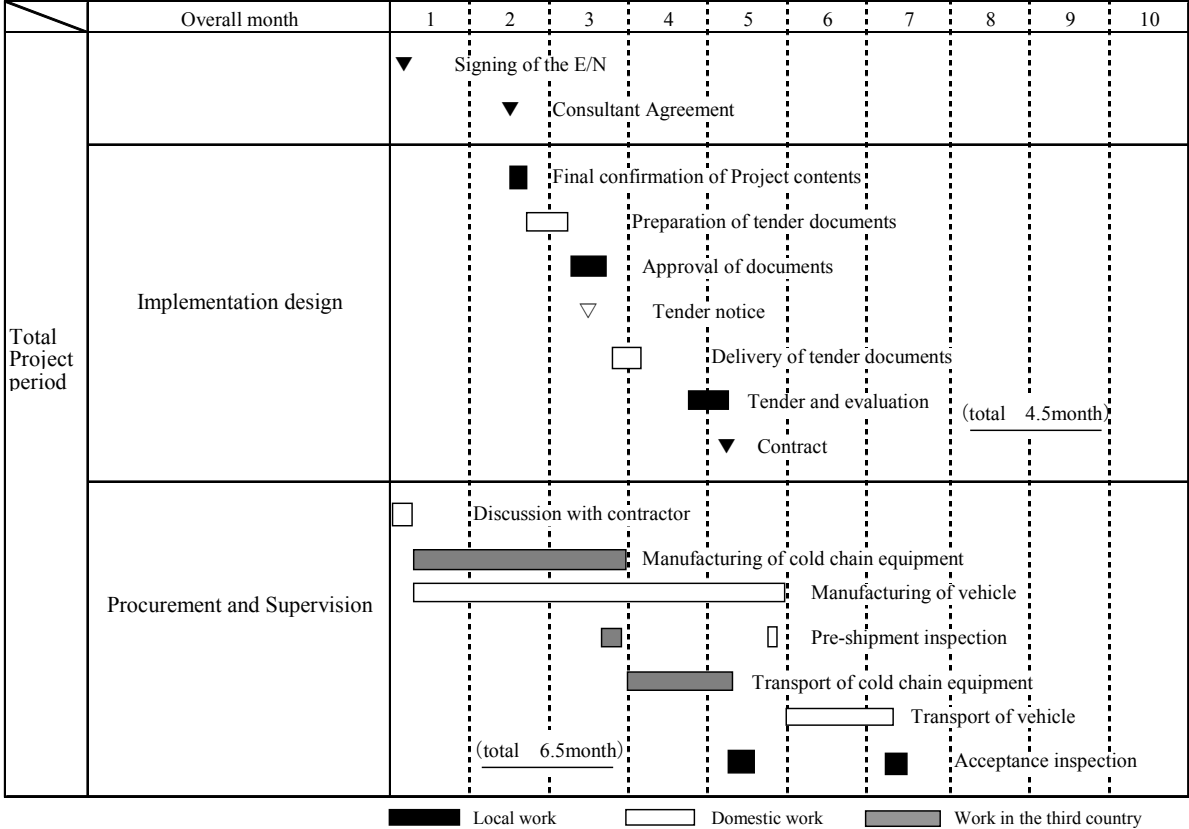
2-2-3-5 Procurement plan

Malawi imports all the equipment to be procured by the Project. Procurement and repair of the parts of vehicles are possible because there are the agents of main manufacturers in Malawi. However there are not many manufacturers of cold chain equipment that have agents in Malawi, and the replacement parts are usually procured by the UNICEF. Even when the procurement route is secured, there are many cases in which the equipment cannot operate for a long period of time because the parts cannot be obtained in due time because of the lack of budget or because it takes time until the parts can be obtained. Considering these situations, the Project shall procure the replacement parts by assuming the items recommended by the WHO/UNICEF and manufactured as the standard items.

2-2-3-6 Implementation schedule

The implementation period shall be 11 months. Details of the implementation schedule are shown in Table 2-8.

Table 2-8 Implementation schedule table



2-3 Obligations of recipient country

- To secure the installation sites of the equipment
- To bear the expenses necessary for the customs clearance and the domestic transportation of the equipment to be purchased by the grant aid as a rule and guarantee the prompt implementation of the Project
- To establish a bank account in the bank in Japan and issue an authorization to pay (A/P), for the above-mentioned charge.
- To exempt from customs duties, domestic taxes, and other financial surcharges imposed on the Japanese party for the duties and the equipment to be procured according to the approved agreement and duties
- To provide necessary conveniences for the entry to and stay in Malawi for the implementation of the duties of the Japanese party to be provided according to the approved agreement
- To properly and effectively maintain and use the equipment to be purchased based on the grant aid for the implementation of the said Project and secure the necessary staff for this purpose. To

bear all the expenses necessary for the implementation of the Project such as the maintenance costs except for the costs borne by the grant aid

- To distribute the procured equipment to the target facilities in Malawi
- To install the solar refrigerators and/or freezers (These items shall be installed with the cooperation of the UNICEF.)

Costs borne by Malawi

Installation cost of solar refrigerators and/or freezers: US\$12,000 (approximately 1.4 million yen)

#### 2-4 Project operation plan

The equipment to be procured by the Project shall be distributed to provincial vaccine warehouses, district health offices, and health centers. Daily cleaning and inspection of the cold chain equipment such as refrigerators and/or freezers are conducted by the staff in charge of each facility. As for the temperature control of refrigerators and/or freezers, temperature is regularly measured and recorded every day and the vaccines are stored properly. Simple repair of the equipment is conducted by each health center, but if the compressor of the refrigerator breaks down, two to three mechanics assigned to the district health office shall conduct repair.

As for the equipment used for delivery, each facility repairs the bicycle tires. Motorcycle and vehicles are repaired by the private repair factory in the district or the repair shop of the agent in the capital of district such as Lilongwe City or Blantyre City. However, after the repair tool kits are procured by the Project, regular inspection and simple repair shall be implemented by the health offices.

The fuel and repair costs of the equipment to be distributed to the provincial vaccine warehouses shall be paid from the maintenance cost of the national EPI unit. The fuel and repair costs of the equipment to be distributed to the district health offices and the health centers shall be paid from the budgets of the district health offices. The fuel for the gas or kerosene freezers and/or refrigerators used at the facilities with no electric supply is regularly supplied by the district health offices. The annual fuel cost per one refrigerator is approximately US\$50 (electric) to US\$200 (gas).

When spare parts are necessary, the ones stocked by the district or the country shall be used. If no stock is available, the district health office usually purchases the spare parts. However, some of the expensive parts are purchased by the government. In addition, the UNICEF and others

supports the procurement of spare parts.

The staff necessary for the operation and maintenance of the Project is sufficiently available for the present system and there is no need to employ new staff.

The equipment to be procured by the Project shall supplement and/or replace the defective and/or deteriorated equipment, and there shall be no generation of any large amount of maintenance cost. Daily maintenance and inspection as well as the fuel supply can be handled by the present system. On the other hand, with the improvement of repair tools at each health office, the present situation in which the defective equipment is left unused for a long period of time due to the lack of tools or the simple repairs are entrusted to a third party shall be improved and the maintenance cost is expected to be reduced.

## Chapter 3 Project Evaluation and Recommendations

### 3-1 Project Effect

#### 1) Direct effect

The cold chain equipment, vaccine delivery vehicles, and immunization activity vehicles shall be improved all over Malawi.

#### 2) Indirect effect

i. As the necessary quantity of vaccines can be properly stored at the required places and delivered in proper condition, a stable supply of vaccines can be available all the time. Furthermore, immunization activities such as mobile immunization and/or educational activities for the residents of remote areas where there is no health and medical facility nearby, can be conducted properly.

ii. With the efficient supply of vaccines to the entire country of Malawi, the immunization activities shall be improved and the immunization rate shall be increased also.

iii. With the reduction of the mortality and morbidity from diseases, due to immunization, the children's health condition shall be improved.

### 3-2 Recommendations

The MHP of Malawi has had long experience on the immunization activities and is considered to be highly qualified to implement the Project. However attention must be paid to the following items.

Each facility shall operate and maintain the procured equipment, and the necessary personnel and budget for the operation and maintenance shall be secured without fail.

In the health and medical field of Malawi, supports and cooperation are provided for each program through the regular meetings of donors. As for the immunization activities, almost all the necessary vaccines and syringes are procured through the support of donors every year, and activities cannot be implemented by Malawi alone. In order for the Project to assure sustained effects in the future, long-term linkage with these donors is indispensable.

On the other hand, the UNICEF holds various lecture meetings on the immunization activities and provides technical instructions to the medical employees. Therefore, under the present situation, technical cooperation is considered not necessary for the Project.

## **Member List of the Survey Team**

1. Mr. Hiroshi MURAKAMI  
Leader  
Japan International Cooperation Agency
  
2. Mr. Masahiro TANAKA  
Equipment Planner 1  
Japan International Cooperation System
  
3. Ms. Chiyuki SHITARA  
Equipment Planner 2  
Japan International Cooperation System

## Survey Schedule

	Date		Activity	Stay
1	21-Feb	Wed	(JL735/17:25) → Hong Kong(21:30, CX749/23:40) →	on board
2	22-Feb	Thu	Johannesburg(6:30, SA170/10:20) → Lilongwe(12:40) Visit JICA, Courtesy call on Ministry of Health & Population	Lilongwe
3	23-Feb	Fri	Site survey in Kasung District	diito
4	24-Feb	Sat	Market survey	diito
5	25-Feb	Sun	Analysis of data	diito
6	26-Feb	Mon	Site survey in Salima District	diito
7	27-Feb	Tue	Site survey in Blantyre District	Blantyre
8	28-Feb	Wed	Site survey in Zomba/Machinga District	Lilongwe
9	1-Mar	Thu	Site survey in Lilongwe District, visit to Central Vaccine Store	ditto
10	2-Mar	Fri	Meeting with donors (UNICEF, WHO, KFW/GTZ, USAID, DFID, ROTARY, NORAD)	ditto
11	3-Mar	Sat	Market survey	ditto
12	4-Mar	Sun	Internal Meeting	ditto
13	5-Mar	Mon	Meeting with UNICEF	ditto
14	6-Mar	Tue	Meeting with MOH & P, Visit to agents	ditto
15	7-Mar	Wed	Discussion on Specifications, Visit to agents	ditto
16	8-Mar	Thu	Discussion on Specifications	ditto
17	9-Mar	Fri	Signing of Minutes of Meeting	ditto
18	10-Mar	Sat	Market survey	ditto
19	11-Mar	Sun	Analysis of data	ditto
20	12-Mar	Mon	Repor to JICA Lilongwe(SA171/13:35) → Johannesburg(16:05)	Johannesburg

## List of Parties Concerned in the Recipient Country

Ser	Organization	Name	Position	Section
1	Ministry of Health and Population	Dr. Wesley Sangala	Chief Technical Advisor	
2		A. D. Katsulukuta	EPI Manager	EPI Unit
3		Moussa Valle	EPI Logistics Officer	EPI Unit
4		A. M. Tambuli	EPI Data officer	EPI Unit
5	Kasungu District Health Office	Dr. Edgar Kuchngale	District Health Officer	
6		E. Chalungama		
7		J. Chitsime		
8	Salima District Health Office	N. Mkandawire		
9		B Mwale		
10	Blantyre District Health Office	Rhoda Kammwamba	D.MCH Coordinator	MCH
11		Sabbinar Mlusu	R. FP. Coordinator	Family Planning
12	Zomba District Health Office	Lingstone B.C. Phiri	D.MCH (EPI) Coordinator	MCH
13		Lincy Maunga	Community Health EPI Coordinator	MCH
14		Nellie Mkhupela	District Nursing Officer	Nursing
15	Machinga District Hospital	Nancy Gunde	MCH Coordinator	MCH
16		Alice C. Chisutu	MCH Coordinator	MCH
17		Ellen Thom	District Public Health Nurse	Family Health
18	WHO	Dr. Nerayo Teklmichael	Representative	
19	UNICEF	Dr. Juan J. Ortiz-Iruri	Head	Health Section
20	DFID	Audrey Kettaneh	Health and Population Officer	Health and Population
21		Catherine Hara	Program Development Officer	Health and Population
22	USAID	Mexon Nyrongo	Health Development Specialist	
23	Royal Norwegian Embassy	Jan H. Olsson	First Secretary	





**MINUTES OF DISCUSSIONS  
ON  
THE STUDY  
ON  
THE PROJECT  
FOR  
IMPROVEMENT OF EXPANDED PROGRAMME ON IMMUNIZATION  
THROUGH REHABILITATION OF COLD CHAIN  
IN  
THE REPUBLIC OF MALAWI**

In response to the request from the Government of the Republic of Malawi (hereinafter referred to as "Malawi"), the Government of Japan decided to conduct a Study on the Project for Improvement of Expanded Programme on Immunization through Rehabilitation of Cold Chain in the Republic of Malawi (hereinafter referred to as "the Project") and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent the Study Team (hereinafter referred to as "the Team") headed by Mr. Hiroshi Murakami, Resident Representative of JICA Malawi office, to Malawi from February 22 to March 12, 2001.

The Team had series of discussions with the officials concerned of the Government of Malawi and conducted a field survey.

In the course of discussions and field studies, both parties confirmed the main items described in the attached sheets. The team will proceed to further works and prepare the Study Report.

Lilongwe, March 9, 2001

村上 博

Mr. Hiroshi Murakami  
Leader  
The Study Team  
Japan International Cooperation Agency  
Japan



Dr. W.O.O. Sangala  
Chief Technical Advisor  
Ministry of Health and Population  
The Republic of Malawi

## ATTACHMENT

### 1. Objectives

The Objectives of the Project is to improve cold chain system through the provision of cold chain equipment.

### 2. Project Sites

The project sites are whole of Malawi.

### 3. Responsible and Executing Agency

Responsible Agency is the Ministry of Health and Population.

Executing Agency is the Ministry of Health and Population.

### 4. Items Requested by the Government of Malawi

After discussion with the Team, the items described in Annex-1 were finally requested by the Malawi side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

### 5. Japan's Grant Aid System

5-1. The Malawi side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-2.

5-2. The Malawi side will take necessary measures as described in Annex-3 for the smooth implementation of the Project on the condition that the Grant Aid is extended to the Project by the Government of Japan.

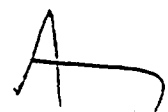
### 6. Schedule of the Study

6-1. The consultants will proceed to further studies in Malawi until March 12.

6-2. Based on the Minutes of Discussions and technical examination of the study results, JICA will prepare a study report on the Project and send it to the Government of Malawi around August 2001 provided that the Government of Japan approves the report.

### 7. Other relevant issues

The Government of Malawi will ensure all the necessary measures for the implementation of the project such as allocating budget and personnel and prompting custom clearance and local transportation of all items procured in the Project.



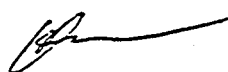
## Items requested by Malawi side

	Item	Specifications	Priority		
			A	B	C
1	Inclined Refrigerator or Freezer	Compression, storage capacity ap. 160L	10		
2	Icepack Freezer	Compression, storage capacity ap. 140pcs icepack	54		
3	Refrigerator and Icepack Freezer A	Electricity and Gas, storage capacity ap. 50L	250		
4	Refrigerator and Icepack Freezer B	Electricity and Kerosene, storage capacity ap. 50L	175		
5	Photovoltaic Solar Refrigerator & Icepack Freezer	Solar system, Storage capacity ap. 60L		15	
6	Large Vaccine Cold Box	Long range, storage capacity ap. 8L, weight ap. 20kg	75		
7	Large Vaccine Carrier	AP. 2Liters	2000		
8	Voltage Regulator	for Compression Refrigerators	64		
9	Voltage Regulator	for Absorption Refrigerators	100		
10	Basic Tool Kit	for general use	29		
11	Cargo truck	4x2, Diesel, AP. 3tons payload	3		
12	Pickup truck	Double Cabin, 4WD, Diesel	10		
13	Motorcycle	Off Road type, 125cc	20		
14	Bicycle			400	

Priority A / Essential

Priority B/ Necessary to study

Priority C/ If possible




## Japan's Grant Aid System

### 1. Grant Aid Procedures

1) The Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by the Cabinet)
Determination of Implementation	(Exchange of Notes between the Government of Japan and the recipient country)
Implementation	(Implementation of the Project)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Japan's Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study Report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the Project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

### 2. Basic Design Study

#### 1) Contents of the study

The aim of the Basic Design Study (hereinafter referred to as "the Study") conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

- a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- d) Preparation of a basic design of the Project
- e) Estimation of costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

## 2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA select (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

## 3. Japan's Grant Aid Scheme

### 1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials or such.

### 2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as whether, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of the "Verification".

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals.

Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertaking required of the Government of the Recipient Country.

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- c) To secure buildings prior to the procurement in case the installation of the equipment.
- d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
- f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-Export"

The products purchased under the Grant should not be re-exported from the recipient country.

9) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

## Major Undertakings to be taken by Each Government

ANNEX-3

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To bear the following commissions to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
2	To ensure prompt unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
4	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		●
5	To maintain and use properly and effectively the facilities contracted and equipment provided under the Grant Aid		●
6	To bear all the expenses, other than those to be borne by the Grant, necessary for the transportation and installation of the equipment		●