

CHAPTER 3 IMPLEMENTATION PLAN

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3-1 Implementation Plan

3-1-1 Basic Concept

The Project will be implemented in accordance with the framework of the grant aid scheme of the Government of Japan after the conclusion of the Exchange of Notes (E/N) by the Government of Japan and the Government of Ghana following a cabinet decision on the implementation of the Project by the Government of Japan. The Government of Ghana will then select a Japanese consultancy firm as the Consultant for the Project to proceed with the detailed design work on the facilities and equipment. Following finalisation of the detailed design documents, a Japanese construction company and a Japanese equipment supplier, selected on a tender basis and acting as the Contractor and Equipment Supplier respectively for the Project, will conduct the construction work and the equipment procurement and installation. All of the consultancy, construction and equipment procurement/installation agreements will become valid once they have been certified by the Government of Japan.

The work management system will be established by the project implementation body, the Consultant, the Contractor and the Equipment Supplier under the control of the related organizations of the two governments involved. The basic issues and points to note for the implementation of the Project are described below.

(1) Project Implementation Body

The National Council for Tertiary Education (NCTE) of the Ministry of Education will be the Ghanaian agency overseeing the implementation of the Project and will act as the Ghanaian party to the agreements. The Noguchi Memorial Institute of Medical Research (NMIMR) will act as the front office for project implementation and will be responsible for general coordination during the project implementation period. As the project site is located on the Legon Campus of the University of Ghana, the Development Office of the University's Head Office will be in charge of technical issues.

In view of the above division of work, the establishment of the Project Implementation Committee is desirable to act as the project implementation body on the Ghanaian side to manage all processes from the detailed design to the completion and handing-over of the various facilities. The members of this Committee should preferably include representatives of the NMIMR, the Development Office of the University of Ghana, the NCTE, Ministry of Finance, Ministry of Health and the JICA Ghana Office.

(2) Consultant

Following the signing of the above-mentioned E/N, the Government of Ghana will conclude a consultancy agreement on the designed design for the Project with a Japanese consultancy firm and this agreement must be certified by the Government of Japan. The prompt conclusion of the consultant agreement after the signing of the E/N is crucial for the smooth progress of the detailed design stage. After certification of the agreement, the Consultant will prepare the detailed design documents based on the present basic design study report through consultations with the NMIMR and will have the documents approved by the Government of Ghana. At the tender and construction stages, the Consultant will conduct the tender and work supervision based on the detailed design documents. The Consultant will also supervise the equipment-related work, ranging from the tender for equipment to installation, test operation and final handing-over.

(3) Contractor

The Contractor will be selected from among Japanese construction companies which satisfy certain qualifications, will construct the planned facilities within the contracted period in accordance with the detailed design documents prepared by the Consultant and will hand them over to the Ghanaian side. The main components of the construction work will comprise building construction, renovation, air-conditioning & ventilation, plumbing & sanitation, electrical installation and external work, all of which will be conducted by the Contractor using subcontractors, engineers and workers from Ghana and/or Japan.

(4) Equipment Supplier

The equipment supplier will be selected from among Japanese trading companies which satisfy certain qualifications and will procure and install the equipment which will meet the specifications set forth by the Consultant and approved by the project implementation body within the contracted period. At the installation stage, the Equipment Supplier will dispatch engineers specialising in the procured equipment to Ghana to supervise the work and to also explain how to operate the equipment to the Ghanaian side.

3-1-2 Implementation Conditions

(1) Local Construction Industry

The general conditions of the local construction industry in the Accra Area are described below.

- Many large-scale public works are conducted by foreign-affiliated local construction companies under the supervision of the Ministry of Works and Housing. As local construction companies are not general construction companies and their annual turnover is fairly small.
- Carpentry, plastering, reinforcing and finishing, etc. are established as special trades (vocations). But, labourers are often temporary workers and tend to lack specialist knowledge. As a result, manpower of 2.5 - 3 times the case in Japan is required on average.
- As there are not many ready-made industrial products, materials are often processed to the required specifications on site.
- There are many price fluctuations. In the case of such key materials as concrete and reinforcing bars for example, the price has risen by 10 - 20% in the last 12 months. The labour cost has also risen by some 15% (on a local currency basis).

(2) Points to Note for Project Implementation

a) On the Construction Work

- The planned facility is a two-story reinforced concrete building and foreign-affiliated local construction companies have sufficient technical ability to construct such a building. Meanwhile, local labourers are often temporarily employed and do not have special skills. The construction schedule must, therefore, be carefully planned to avoid any unnecessary repetition or waiting.
- The rainy season in Accra lasts from April to July with a concentration of rainfall in June. Accordingly, a sufficient curing period must be allowed for foundation and concrete work during the rainy period.
- A stable supply of crushed stone and sand for concrete will be essential for the successful management of the work schedule. As mountain sand frequently containing mud or organic matters is commonly used in Accra, strict quality control will be required at the concrete plant on the construction site.
- As the Project mainly intends the extension and renovation of existing facilities, protection and safety measures to ensure the continued use of the existing facilities will be required for the planning of temporary structures.
- In relation to the installation and test operation of equipment, a sufficient period should be allocated for guidance on equipment use, regular checks and parts replacement method, etc. for the maintenance staff of the NMIMR.

b) On the Equipment-Related Work

- The regular checks and maintenance of research and laboratory equipment at the NMIMR are conducted by the users while equipment which has broken down is sent to the maintenance department for checking and repair. This means that guidance on checking methods and trouble-shooting will need to be provided for

- In connection with the checking and repair of research and laboratory equipment, the maintenance staff have pointed out a need for maintenance manuals and circuit diagrammes. These should accompany the selected equipment and the scope of possible checking and repair based on the manuals and circuit diagrammes should be explained to the Ghanaian side by the time of the final handing-over.
- The maintenance staff of the NMIMR have pointed out the difficulty of repairing research and laboratory equipment incorporating electronic circuits by themselves. It will accordingly be necessary to urge the equipment manufacturers to appoint local agents when selecting the equipment to provide a system for technical exchange with the maintenance staff of the NMIMR.

(3) On the Work Schedule

- A reasonable and adequate work schedule must be planned.
- In the case of facilities designed for biological or animal experiments, appropriate measures will be necessary to prevent contamination or biohazards. Strict safety measures and work precision will, therefore, be required for some of the facilities and equipment.
- The dispatch of staff and expert engineers from Japan will be kept to a minimum and their appropriate number and assignment periods should be determined in accordance with the work progress.
- Although the scope of local construction materials (industrial products) which can be used for the Project is limited, local materials should be used where possible. In addition, materials and finishings which are easy to maintain should be selected.
- The planned Renovatement of the existing facilities as part of the Project can only be conducted after relocation of the staff and equipment to the new building, making the preparation of a work plan which incorporates the carefully planned timing of the relocation and Renovatement work and which

- The planned Renovation of the existing facilities as part of the Project can only be conducted after relocation of the staff and equipment to the new building, making the preparation of a work plan which incorporates the carefully planned timing of the relocation and Renovation work and which minimises the adverse impacts of the construction work on research activities essential.

(4) Work Supervisors

For the punctual completion of the facilities meeting the specifications set forth in the detailed design documents within the planned construction period, the Japanese Contractor must be capable of smoothly conducting the joint work with local construction companies while providing appropriate technical guidance and implementing strict schedule control. It is, therefore, desirable that the Contractor appoint work supervisors conversant with the local conditions to achieve high quality facilities based on a precise understanding of the nature of the planned facilities.

Given the contents and scale of the facilities planned under the Project, the following full-time work supervisors will be required.

< Building Work >

- Chief supervisor (1 person) : general management, others.
- Architectural engineer (1 person) : guidance on construction work;
schedule control; guidance on working drawing preparation, others.
- Services engineer (1 person) : equipment installation and test operation;
technical guidance, schedule control, others.
- Administrator (1 person) : administrative work and labour control;
import procedure, others.

< Equipment Work >

- As required : installation and test operation of laboratory and inspection equipment; technical guidance and instructions on operation manuals.

3-1-3 Scope of Work

The following scope of works between the two governments for implementation of the Project appears reasonable.

(1) Work to be Undertaken by Government of Japan

1) Facilities

a) P3 experiment building

- P3 laboratories : P3 level laboratories (virology; bacteriology) and anterooms, etc.
- Training laboratories : training laboratories, common laboratories and freezer room, etc.
- Administration office : administration room, changing place and WC, etc.
- Maintenance W/S : maintenance workshops (mechanical; electrical) and parts storages, etc.

b) Laboratory animal building

- Animal breeding rooms : small and medium size animal breeding rooms, clean-side preparation room and pass rooms, etc.
- Animal experiment rooms: washing and sterilisation room, diagnosis room, animal raising room, animal laboratory, infected animal raising room and infected animal lab., etc.
- Large animal rooms : sheep raising room, poultry raising room and monkey observation and raising room, etc.
- Administration rooms : administration office, Unit Head's office and WC, etc.
- Feed production rooms : feed production room, material storage, bedding storage and waste storage, machine room and boiler room, etc.

c) Conference Hall building

- Meeting facilities : conference hall (117 seats), anteroom and equipment storage, etc.
- Seminar rooms : seminar rooms (20 seats, 2 rooms), canteen and WC, etc.

d) Renovation of existing facilities

- Laboratory animal room (including Air Conditioning room):
Renovate to provide research room for Nutrition Unit and storage
- Maintenance workshop : Renovate to provide larger laboratory with centre tables for Nutrition Unit
- Transport office : Renovate to provide laboratory for Chemical-Pathology Unit
- Conference room : Renovate to provide office for Account Section
- Renovation work related to relocation of research department;
 - a) Epidemiology and Nutrition Units will move to ground floor from first floor
 - b) Immunology and Histology Units will move to first floor from ground floor
- Feed preparation shed : Renovate to provide Insectory and Parasite host (snail) breeding rooms

2) Equipment

- a) P3 laboratory equipment : ultra-centrifuge, freezer, refrigerator and safety cabinets, others.
- b) Animal laboratory equipment: breeding cages and racks, positive (clean) racks with cages, negative racks with cages, safety cabinets, dissection tools, pellets mill, others.
- c) Electron microscope : transparency electron microscope and accessories
- d) Other equipment : laboratory tables and tools for maintenance, etc.

(2) Work to be Undertaken by Government of Ghana

- a) Site preparation prior to the commencement of construction work.
- b) Provision of sites for temporary buildings and material storage.
- c) Auxiliary external work, including landscaping and outdoor lighting.
- d) Provision of common office furniture, fixtures and fittings.
- e) Supply of consumable and spare parts required for maintenance of facility and equipment.
- f) Banking arrangements and payment of banking commission.
- g) Swift arrangement of landing, tax exemption facilities, customs clearance and inland transportation of imported equipment, etc.

3-1-4 Consultant Supervision

The Consultant will organize a project implementation team and will ensure the smooth progress of the Project from detailed design to work supervision and final handing-over, taking the objectives of the basic design into consideration, in line with the principles of the grant aid scheme of the Government of Japan. At the work supervision stage, the Consultant will dispatch a full-time supervisor with appropriate technical expertise to the project site. Through this full-time, on-site supervisor, the Consultant will try to facilitate the smooth progress of the schedule control, work guidance and reporting work. The Consultant will also dispatch those responsible for the various components of the detailed design to the project site in accordance with the actual progress of the work for checking and work guidance purposes.

(1) Main Principles of Supervision

- Punctual completion of the facilities based on the construction schedule will be aimed at through close communication with and reporting to the related organizations and those in charge in Japan and Ghana.
- Prompt and appropriate guidance and advice will be provided for those involved in the work to ensure that the constructed facilities meet the specifications set forth by the design documents.
- Priority will be given to the use of local construction methods using local materials as much as possible.
- In regard to the building service and laboratory equipment, local maintenance staff will be invited to participate in their installation and test operation with a view to transferring their maintenance techniques.
- Appropriate guidance and advice will be provided in regard to post-handing-over maintenance and economical operation to facilitate the smooth operation of the facilities.

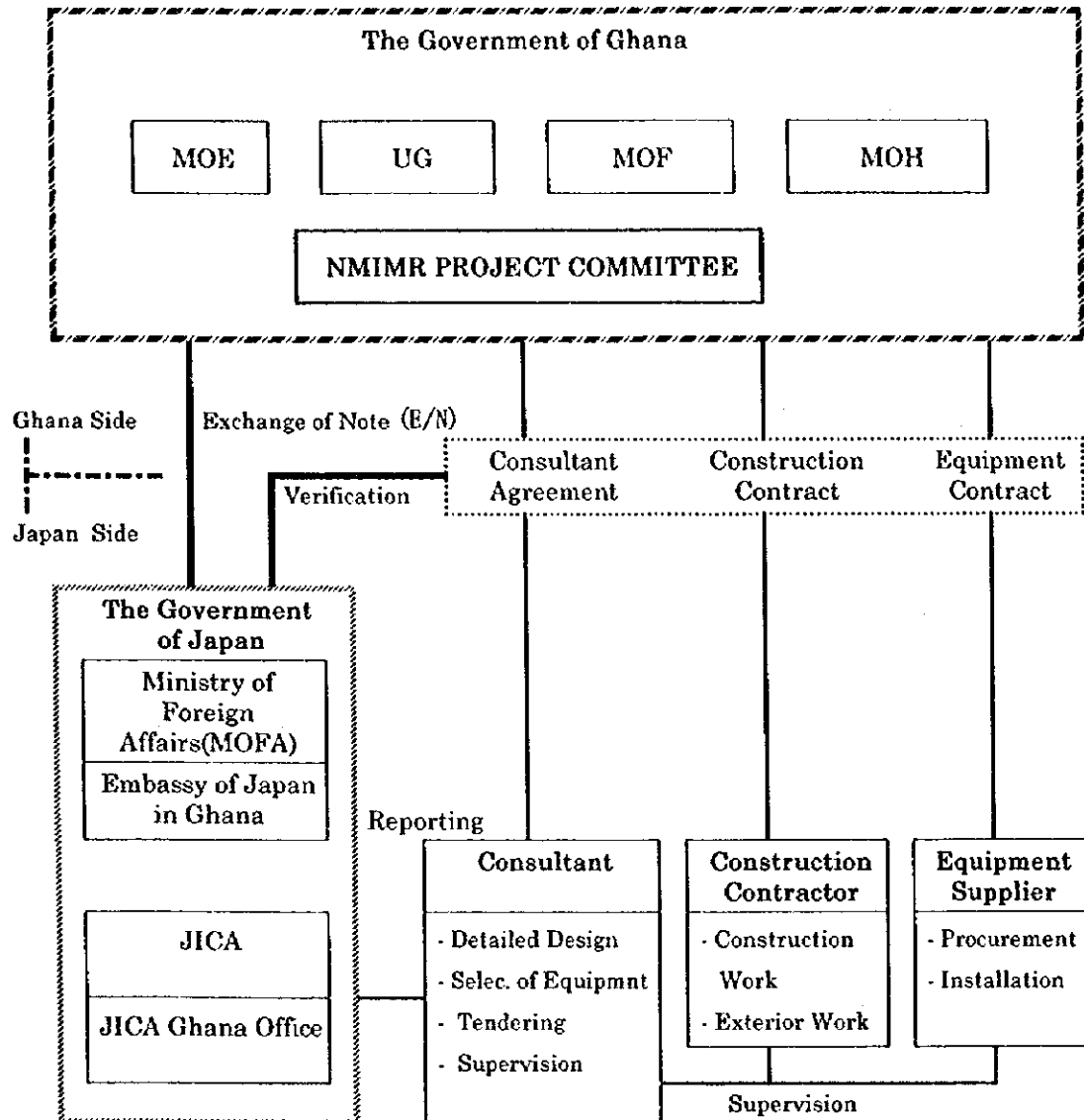
(2) Contents of Work Supervision

- Cooperation to conclude the construction agreement:
selection of the Contractor, determination of the contracting method, preparation of the draft agreement, confirmation of the contents of the specifications and witnessing of the work agreement, etc.
- Confirmation and checking of work drawings, etc.:
confirmation of the work drawings, samples and materials, etc. submitted by the Contractor and their checking if necessary.

- **Work guidance:**
examination of the schedule plan and work outline, etc., provision of guidance for the Contractor and reporting of the work progress to the Owner.
- **Cooperation for the payment authorisation procedure:**
cooperation for the payment authorisation procedure through examination of the contents of invoices and the work progress in regard to the construction cost to be paid during the construction work and upon completion of the said work.
- **Witnessing of inspection:**
inspection of the work progress as and when necessary during the construction period to advise the Contractor, confirmation of the fulfillment of the construction agreement after the completion of the construction work, witnessing of the handing-over of the contracted items to complete the consultancy work with the approval of the Owner and the reporting of necessary information regarding the work progress, payment procedure and final handing-over to the Government of Japan.

Next Figure shows the work supervision system and the organizations involved as described above.

Construction Supervision Plan



3-1-5 Procurement Plan

(1) Principles of Procurement

Special attention should be paid to the following issues in regard to the procurement of materials and equipment relating to the construction of the planned facilities.

1) Local Procurement

The equipment and materials to be used should be locally procured where possible to ensure easy maintenance and repair after handing-over. Proper care should, however, be taken to confirm uniform quality and a feasible supply volume so that the planned functions of the facilities and the work schedule are not disrupted. Imported products which can be locally procured, i.e. those readily available in the local market, will be classified as local products.

2) Procurement in Japan

In the case of equipment and materials of which local procurement is difficult, their procurement in Japan will be considered. In the case of building service equipment and electrical equipment which will require special ordering, timely orders in accordance with the work progress will be required as a long time is required to complete the process from initial order placement to design approval, manufacture and shipment from the manufacturer.

3) Procurement from Third Country

Equipment and materials of which procurement from a third country would result in cost saving in view of the original prices and transportation and packaging costs if procured in Japan will be procured from a third country, taking their quality and required period of manufacture into consideration. Imported products which are specially ordered on the grounds that a maintenance agreement can be made with a local agent to facilitate their maintenance and repair will be classified as procurement from a third country.

4) Transportation Plan

In principle, maritime transportation will be used for the transportation of equipment and materials from Japan with arrival at Port Tema, located some 30 km east of Accra. This maritime transportation usually takes two months although the travelling time considerably varies depending on the number of calls at port opted for by the vessels. In view of the fact that some parts of the equipment and materials may suffer a deterioration of their performance due to shock, humidity and/or high temperatures, tropical packaging specifications should be employed for the packaging.

Customs clearance at Port Tema usually takes some two weeks although the actual time depends on the number of containers. The Government of Ghana is currently considering a review of the tax exemption measures as part of its overall taxation reform and there is a possibility that the customs clearance procedure may become more complicated and time-consuming. The Contractor and Equipment Supplier must ensure that all the required documents for customs clearance are in order while the Ghanaian side Ministry of Education should provide the necessary measure to ensure the prompt customs clearance of the equipment and materials imported to Ghana.

Factory → Yokohama → Port Tema → Customs Clearance → Site
(one week) (two months) (two weeks) (one week)

The actual inland transportation time from Port Tema to Accra will depend on the mobility of the local transport company. Several days will be required if 3 to 6 numbers of 40 feet containers. If the number of containers is increased to 20, however, some two weeks will be required for this inland transportation.

The estimated transportation time from the factory gate to the project site is, therefore, approximately three (3) months.

5) Export Procedure

Following the abolition of the COCOM Regulations, an export permit is required in Japan for biological laboratory apparatus destined for a developing country. The subjects of such a permit among the equipment planned under the Project are various equipment and safety cabinets to be used for the P3 laboratories. Accordingly, it will be necessary for the Contractor and Equipment Supplier to thoroughly check the documents and time required to obtain an export permit to prevent any delay in the implementation schedule of the Project.

Residual radioactive inspection will be required at the time of customs clearance in Ghana. It will, therefore, be necessary to obtain a certificate of pre-inspection at the port of loading to simplify the customs clearance in Ghana.

(2) Procurement Plan for Construction Equipment and Materials

Next Table shows the examination results of the field survey findings and relevant information on third countries based on the above procurement principles. The reason is also given for those items to be procured in Japan or a third country. The findings of the quality survey on the main construction equipment and materials included in the procurement plan can be found in the relevant table in the Appendices.

Table 3-1-1 Study of Main Construction Materials and Procurement Plan

(1) Building Work

Works	Material	Procurement Plan			
		Local	Japan	Others	
Concrete Work	Portland Cement	○			One Cement Factory (CHACEM) using imported clinker. River sand mixed with organic substance. Available from Crusher Factory. Available from Steel Factory. Imported Conc Panel at market.
	Sand	○			
	Crushed Stone	○			
	Steel Bar (Deformed) Wooden Form	○ ○			
Steel Work	Formed Steel Steel Sheet	○	○ ○		Local-made; Light Formed only. Local-made; for housing only.
Masonry Work	Concrete Block Bricks	○			Available many type. Local-made; not suit.
Water Proof Work	Asphalt W/Proofing Cement W/Proofing Sealing Material	○ ○	○ ○		Available at market; EC/China. Available at market; Imported. Durability.
Tile Work	Semi-porcelain Tile Ceramic Tile	○			Imported, but small stock. Wall/Floor decoration, Local and Imported
Wooden Work	Wood Plywood	○ ○			Available at market. Available at market; imported.
Roof Work	Roof Tile Asbestos Sheet Metal Sheet			○	Available; half-round only. Available but small stock. Durability.
Metal Work	Light Steel Frame Alumin. Louver Roof Drain		○ ○		Not common, but wooden. Available; poor manufacturing Not common.
Stone Work	Stone Tile Terrazzo (insitu) Terrazzo Tile	○			Local Granite; Imported Tiles Common floor finish w/imported chip and white cement. Not common.
Plastering Work	Cement Mortar Plaster	○ ○			Common wall finish. Common wall finish.
Steel Sash Work	Alum. Sash Louwer Window Steel Door and Frame	○ ○	○ ○	○	Depends on price. Steel made; for housing only. Welding is not suit.
Wooden Sash Work	Door and Frame	○			Available panel/flash door.
Ironmongery Work	Door Handle/Check	○	○		EU/China made are available ; depends on quantity.
Glass Work	Plate Glass Heat Absorption Glass	○	○		Available 5mm thick. Common for Office Building but imported.
Paint Work	Interior Paint Exterior Paint	○ ○			Available imported/local-made at market; easy for repainting.
Interior Finish Work	Plaster BD. Acoustic BD. Glass-wool Formed Polystyrene	○ ○ ○	○ ○ ○		Imported; small stock. Common for Office; Imported; Imported; small stock. Formed Styrene; imported; small stock.
Furniture Work	Labo Table/Sink Wooden Table/Chair Steel Table/Chair	○ ○ ○	○ ○		Formica w/imported sus sink; Available from local Factories. Imported are available.
External Work	Pavement Material	○			Available many size of concrete; local-made.

(2) Mechanical Equipment Work

Works	Material	Procurement Plan			Remarks
		Local	Japan	Others	
A/C Work	Package Type A/C	○	○		Not available in local.
	Separate Type A/C		○		Available; depends on type.
	Exhaust Fan		○		Not available in local.
	Duct Material		○		same as above
	Insulation Material		○		same as above
	Auto-Control		○		same as above
	HEPA Filter		○		same as above
	Middle Filter		○		same as above
Plumbing and Sanitary Work	Dumper		○		same as above
	Sanitary Ware	○	○		Depends on Type and Quantity.
	Water Treatment Plant	○	○		Durability.
	Pipe (PVC)		○		Depends on Type and Quantity.
	Pipe (Steel)		○		Durability.
	Biler		○		Not available in local.
	Insinerator		○		same as above

(3) Electrical Equipment Work

Works	Material	Procurement Plan			Remarks
		Local	Japan	Others	
Lighting·Cabling Work	Wire · Cable	○	○		Depends on Type and Quantity.
	Lighting Fixture	○	○		Durability.
	Panels		○		Durability.
Equipment Work	Generator	○	○	○	Maintenance Service by Agent.
	Telephone	○			Depends on Type and Quantity.
	Intephone	○			Durability.
	Fire Alarm System	○			Maintenance Service by Agent.

(3) Procurement Plan for Research and Laboratory Equipment

As most of the planned research and laboratory equipment is not manufactured in Ghana, it will be procured from Japan or a third country. The following notes must be carefully noted in regard to its procurement.

- As research and laboratory equipment often requires expendables and replacement parts, the selected equipment should be that for which expendables and replacement parts can be easily obtained by the NMIMR.
- Computers and copiers for which local agents are available will be locally procured even if they were originally imported.
- In the selection of equipment for which a local agent is unavailable, Japanese manufacturers will be encouraged to appoint a local agent. In this way, it is hoped to improve the convenience of maintaining the imported equipment by the NMIMR and to upgrade the local technical level through exchanges between the maintenance staff of the NMIMR and engineers of the appointed agents.
- In the case of equipment requiring special installation and handling skills, specialist engineers will be dispatched from Japan. These specialist engineers will teach the equipment users and maintenance staff regular checking methods and trouble-shooting techniques based on the manuals.

3-1-6 Implementation Schedule

When the construction of the facilities is implemented under the Grant Aid System of the Government of Japan, the following procedures are to be taken:

- i) signing of an Exchange of Notes (E/N) between the two countries,
- ii) selection of a Japanese design and supervision consulting company by the Government of Ghana,
- iii) conclusion of a design supervision agreement between the Government of Ghana and the consulting company,
- iv) three preparatory steps including preparation of design documents for implementation, tendering, and conclusion of a construction contract with the successful tenderer,
- v) construction of the facilities concerned.

After the E/N is signed, MOE/NMIMR (Consultant Agreement, Construction Contract, Certificates for Payments, etc) will act as the implementation agency of the Ghanaian Government.

1) Detailed Design Stage

Tender documents will be prepared based on the basic design, and these will consist of detailed design drawings, specifications, estimations and budget statements, etc. Close discussions are held with related agencies of the Government of Ghana in the initial, middle and final stages of the detailed design preparation stage. After the final results are approved by the agencies concerned, tendering procedures will be undertaken.

2) Tendering Stage

After the detailed design work is completed, prequalifications (PQ: preliminary review for qualification of applying contractors) are announced and carried out in Japan. In accordance with the review, MOE/NMIMR, as the implementing agency, will invite tenderers for the Project, and the tendering will be done in Japan under

the supervision of the concerned parties. The tenderer which offers the lowest price will become the successful one if the contents of its tender are judged to be appropriate, and it will conclude a construction contract with MOE/NMIMR.

3) Construction Stage

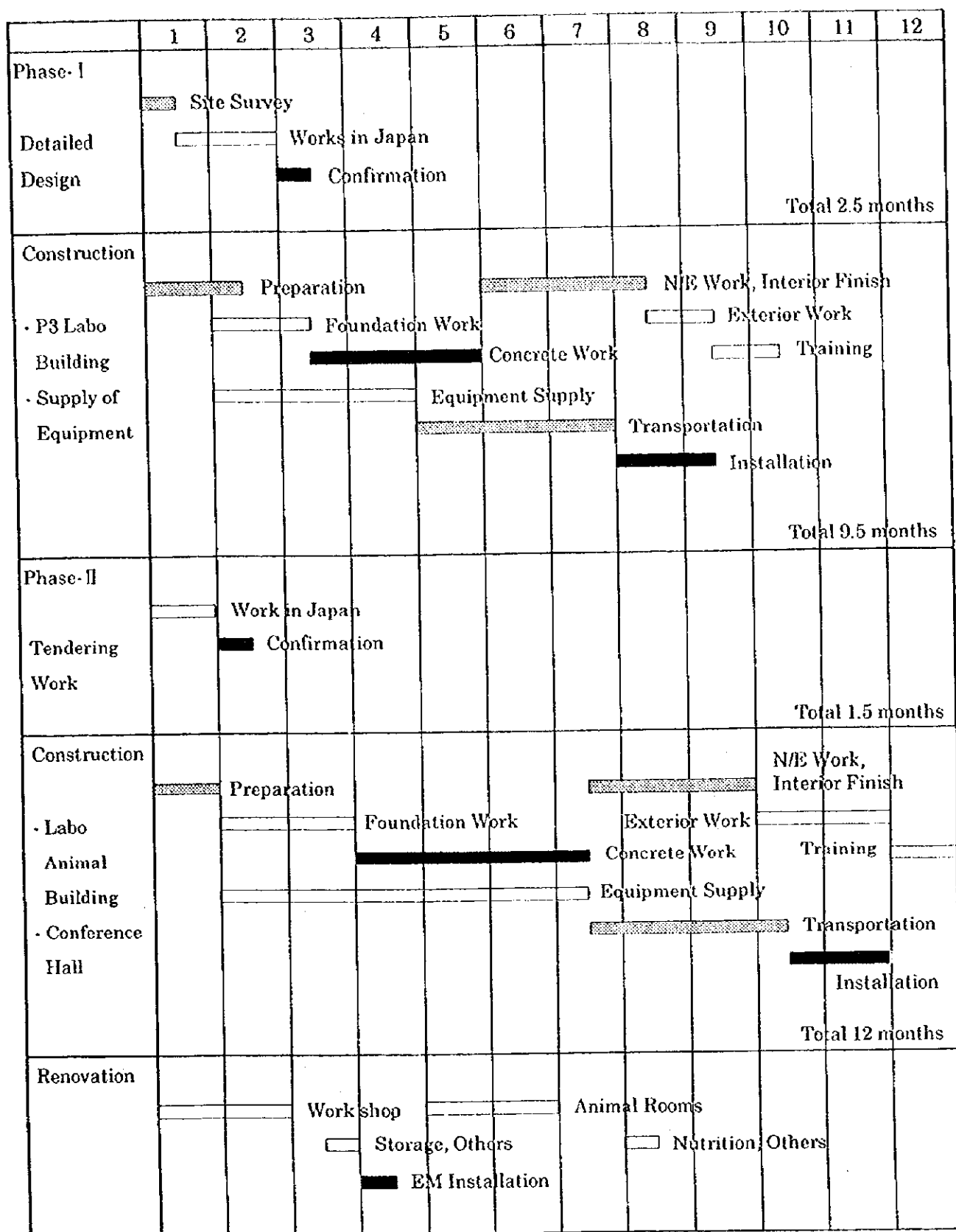
After the construction contract is signed, the construction work will be commenced following verification by the Government of Japan. Judging from the scale and contents of the Project facilities, the construction period is expected at least, to be roughly 8.5 months for Phase-I (construction of the P3 Laboratory Building and procurement / installation of equipment) and around 16.5 months for Phase-II (construction of the Laboratory Animal Building, Conference Hall Renovation of Existing Facilities and procurement / installation of equipment). This, however, is condition on the following:

- i) construction materials and equipment are smoothly procured,
- ii) smooth progress is seen in the Ghanaian administrative procedures and reviews, and preliminary work within the scope of responsibility of Ghanaian side, in special tax exemption and customs clearance procedures,
- iii) the one-year budgetary system of the Government of Japan is applied correctly.

After the handing-over of the new facilities, followed by the smooth relocation of the existing units of the NMIMR to the new facilities, the Renovation work of the existing facilities will commence. The smooth relocation of the existing units of the NMIMR will, therefore, be essential for the Renovation work.

The tentative schedule is shown in the next Figure.

Implementation Schedule



3-1-7 Obligations of Recipient Country

The Government of Ghana is expected to conduct the following to facilitate the implementation of the Project with grant aid provided by the Government of Japan.

- 1) Provision and clearance of the project site prior to the commencement of the construction work
- 2) Provision of sites for temporary buildings and material storage
- 3) Auxiliary external work, including landscaping and outdoor lighting
- 4) Procurement of common office furniture, fixtures and fittings
- 5) Supply of expendables and spare parts required for facility and equipment maintenance
- 6) Banking arrangements and payment of banking commission
- 7) Application for building approval and payment of various fees
- 8) Swift arrangement of landing, tax exemption facilities, customs clearance and inland transportation of the equipment and materials to be procured within the scope of the grant aid
- 9) Exemption of Japanese companies and Japanese nationals involved in the Project from customs duty, domestic taxes and any other levies imposed in Ghana
- 10) Provision of all conveniences for the Japanese nationals referred to in 9) above in relation to their entry to and stay in Ghana to perform their assignments under the Project
- 11) Appropriate and effective use and maintenance of the facilities constructed and equipment procured under the Project

- 12) Smooth transfer of existing equipment, etc. and payment of all necessary costs following the Renovatement work
- 13) Payment of all expenses required for the implementation of the Project which are not covered by the grant aid

In addition to the items to be addressed by the Government of Ghana in relation to the construction work under the Project, the items required for the maintenance and repair of the existing facilities are listed as follows. While these items do not directly affect the implementation of the Project, they are judged to be essential for the appropriate maintenance and effective use of the existing facilities.

1) Provision and clearance of the project site.	<u>3,900,000 cedis</u>
2) Auxiliary external work. (landscaping and outdoor lightning)	<u>3,500,000 cedis</u>
3) Procurement of common office furniture,others.	<u>10,800,000 cedis</u>
4) Banking arrangement and commissions. (appx 0.1% of E/N value)	<u>24,833,000 cedis</u>
5) Application for Building Approvals.	<u>900,000 cedis</u>
6) Tax exemption and customs clearance.	<u>32,400,000 cedis</u>
7) Transfer of existing equipment.	<u>3,000,000 cedis</u>
TOTAL	<u>(76,183,000 cedis)</u>

3-2 Operation and Maintenance Plan

3-2-1 Facility Operation and Maintenance Plan

(1) Buildings

The three key elements of building maintenance are i) regular cleaning, ii) repair of worn, damaged and/or aged sections and ii) guarding for safety and crime prevention. Regular cleaning has a positive effect on the attitude of facility users in that they carefully handle the facilities and equipment. Regular cleaning is also important to maintain the level of cleanliness required by a medical research institution. It also leads to the early detection of damage and equipment failure with the end result of prolonging the life of building service equipment as well as research equipment.

Table 3-2-1 Summary of Periodical Building Inspections

Exterior	
Repair or repainting of exterior finishes	every 5 years
Inspection or repair of metal roof	Inspection: every year Others: every 5 years
Periodical cleaning of downspouts and drains,etc.	Every month
Inspection and repair of sealings of doors/windows	every 5 year
Periodical inspection and cleaning of drainage	every year
Interior	
Changes in interior finishes	as required
Repair and repainting of interior walls	as required
Repairing of ceiling	as required
Retightening or changing of fittings	every year

The main elements of repair are the repair and rehabilitation of interior and exterior finishing materials protecting the structural body. In addition, the necessity for repair and renovation due to changes of activities and staff increases, etc. arises roughly every 10 years based on actual experience in Japan. The detailed items of regular checking and repair which determine the duration of a building's life will be submitted in the form of maintenance manuals and a briefing on checking methods

and regular cleaning methods which are summarised as above Table will be given at the same time.

In regard to security matters, it is important to check the entry of people into the facilities which are medical facilities handling dangerous pathogenic organisms. It is also important to provide tight security to prevent the theft of the testing equipment and pathogenic organisms kept at the NMIMR.

(2) Service Equipment

Regular "preventive maintenance" is essential for building service equipment prior to reaching the stage of repairing breakdowns and replacing parts. While the life of building service equipment is determined by the length of operation, it can certainly be prolonged by proper operation and regular checks, oiling, adjustment, cleaning and repair, etc. Regular checks can prevent breakdowns and accidents and can also prevent the unnecessary extension of an accident. The preventive maintenance of building service equipment is particularly important to ensure the safe operation of the P3 laboratories and animal experiment facilities.

During regular checks, expendable parts are replaced and overhauling and cleaning, etc. are conducted in accordance with the maintenance manuals, making it essential that the maintenance staff fully understand the designed systems and capacities, etc. to prevent any accident. Accordingly, it is necessary to appoint full-time maintenance engineers for the electrical, air-conditioning, water supply and drainage and special equipment fields.

The maintenance staff of the NMIMR have maintenance experience of the existing equipment. A meeting held during the field survey, however, found that the work of these maintenance staff has mainly consisted of repair at the time of breakdown and the regular preventive maintenance has not been conducted. It will be necessary to establish a system whereby maintenance staff have full knowledge of the new systems through on-site briefings on such systems at the installation and adjustment stage by the time of the final handing-over and when regular checks will be made compulsory. Operation and maintenance manuals will be provided at the time of

handing-over. Next Table shows the standard life expectancy of the main building service equipment.

Table 3-2-2 Life Expectancy of Major Building Service Equipment

Electrical Equipment	
Generator	15 to 20 years
Panel Boards	20 to 30 years
Flourescent Lamps	5,000 to 10,000 hours
Incadescent Lamps	1,000 to 1,500 hours
Telephone Switchboard	30 years
Plumbing Equipment	
Pumps	10 to 15 years
Tanks	15 to 20 years
Pipes and Valves	10 to 15 years
Plumbing Fixtures	20 years
Fire Extinguishers	as required
Sewage Treatment Plant	10 years
Air-conditioning and Ventilation	
Pipes	10 to 15 years
Fans	10 to 15 years
Air Conditioners	10 years
Package-Typed Air Conditioners	5 to 10 years

(3) Laboratory Equipment

1) Laboratory Equipment

The proper maintenance of laboratory equipment is important to ensure safe and efficient activities at the planned facilities. Some of the laboratory equipment to be provided under the Project uses precision parts and/or electronic circuitry which are vulnerable to changes of such ambient factors as temperature and humidity as well as vibration and shock. As the repair of precision parts and electronic circuitry is difficult for the maintenance staff of the NMIMR, this will be conducted by engineers of the manufacturers. As the maintenance staff have suggested that they are able to detect failed parts if circuit diagrammes are available for each equipment, the

provision of such diagrammes as part of the documents to be handed over to the Ghanaian side will be considered within the scope of not infringing the secrets of manufacturers.

In general, equipment maintenance mainly comprises daily checking by users, breakdown checking by expert engineers and regular checking which is conducted once or twice a year. The users of the research and laboratory equipment of the NMIMR are restricted in each department and, as a result, the equipment conditions are excellent. Regular checking and the detection of problematic areas requiring repair are not assigned to the maintenance staff. As there are few local agents at present, much relies upon the follow-up service provided by JICA. In order to improve the situation, it will be necessary to introduce measures designed to encourage manufacturers to appoint local agents so that the closer linkage between the NMIMR and local agents enhances the technical abilities of both parties. Table outlines the required maintenance for various equipment.

Table 3-2-3 Outline of Required Equipment Maintenance

	NMIMR	Service Agent (recommended)
General equipment	4 times / year	once / year
Analytical apparatus	inspection only, regulary	twice / year
Optical apparatus	twice / year	once / year
Biohazard apparatus	twice / year	once / year
Precision apparatus	inspection only, regulary	twice / year
Sterilisation apparatus	3 times / year	once / year

2) Reagents and Consumables

It will be necessary for the reagents and consumables required by the NMIMR to be procured by the NMIMR. Systematic procurement and control will be essential for the proper use of these items in each research unit to ensure smooth research activities. Unlike a medical facility where reagents and consumables require regular restocking, the NMIMR requires reagents and consumables for each research project. This indicates the importance of a carefully planned procurement programme so that wasteful reagents and consumables do not remain after the completion of a project.

3-2-2 Estimation of Operation and Maintenance Cost

The estimated annual operation and maintenance cost after the opening of the new facilities is shown in next Table.

Table 3-2-4 Estimated Annual Operation and Maintenance Cost

Item	P3 Lab. Building	Lab Animal Building	Conference Hall Bldg.	Annual Cost
1. Operation Cost	3,875	9,481	2,452	15,745
a) Electricity	3,694	6,309	2,329	12,332
b) Water	181	1,513	123	1,754
c) Diesel Oil	-	1,659	-	1,659
2. Maintenance Cost				49,359
a) Building				5,302
b) A/C Filter	3,640	9,100	-	12,740
c) A/C Service Contract	6,260	4,714	4,543	15,517
d) Equipment				9,000
f) Animals				6,800
Total				65,104

1) Operation Cost

Facility operation cost estimated as condition of attached sheet.

15,745 US\$ / year

2) Maintenance Cost

a) Building

The level of the building maintenance cost considerably changes with the passage of time. The estimation is conducted based on an assumed average annual repair cost of 2 US\$/m²/year for a 30 year span.

$$2 \text{ US\$/m}^2 / \text{year} \times 2,651 \text{ m}^2 = \underline{5,302 \text{ US\$/year}}$$

b) Building Service Equipment

The repair cost for building service equipment remains low for the first five years or so of use. Thereafter, parts replacement and equipment renewal due to ageing

are gradually required. The average annual repair cost for a 10 year span is estimated to be 0.5% of the building service repair cost.

6,000 US\$ / year

c) Filter exchange for A/C

Every 3 years, HEPA filters and Middle Performance filters have recommended to exchange. One set of filter estimated 455 US\$/year and there are 8 sets for P3 Laboratory Building and 20 sets for Laboratory Animal Building, hence;

12,740 US\$ / year

d) Maintenance Contract for A/C system

A/C system for P3 Labs. and Animal Exp. Labo are recommended to contract services with local Agent. Agent cost in Ghana estimated by 4.55 US\$/MC/month. (MC: Capacity of machine as Mega Calorie)

15,517 US\$/year

e) Laboratory Equipment

i) Maintenance and Repair Cost

While this cost varies depending on the frequency of equipment use, it is estimated to be 0.2% of the total equipment cost.

6,000 US\$/year

This is including HEPA filters costs for equipment, such as;

Safety Cabinets(6 sets): 600 US\$/set/every 3 years

Positive/Negative Racks(12 sets): 400 US\$/set/every 2 years

ii) Reagents and Consumables

While this cost also considerably varies depending on the frequency of use, it is estimated to be 0.1% of the total equipment cost. This is including cubes for centrifuges, micro-plates for ELISA Reader, others.

3,000 US\$/year

f) **Animals**

The cost of live animals is estimated based on the number of required animals (indicating the number of experiments) and data obtained during the field survey. It is assumed that small animals will be bought in the first year of operation and will be bred. Poultry, monkeys and sheep will be renewed every year.

- **Animal purchase**

Small animals: 2,000 US\$/year

Poultry and large animals: 500 US\$/year

- **Feed preparation cost:** 3,900 US\$/year

- **Auxiliary materials: (10% of feed)** 400 US\$/year

Total 6,800 US\$/year

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATIONS

4-1 Project Effect

4-1-1 Examination of Suitability

(1) Necessity of Infectious Diseases Prevention

To reduce the incidence of infectious diseases and lower the rate of infant mortality in Ghana, a study of the causes and a determination of the appropriate preventive vaccinations are indispensable measures. Even in the case of AIDS and tuberculosis, the virus causing AIDS and the bacteria causing tuberculosis had to be confirmed; and, the composition of antigens and antibodies had to be determined, before prevention and treatment was possible. Moreover; through inappropriate prescriptions and a lack of medical attention, there is the danger that drug resistant strains could be strengthened.

This project will be implemented as a joint effort of concerned professional associations under the auspices of the "Infectious Disease Prevention Project". Research and training sponsored by the Project is designed to coordinate and implement the public health policies of the Government of Ghana and Japan's Global Initiative to address problems such as those posed by AIDS and overpopulation. For this reason, the Project is considered highly appropriate.

(2) Project Administration

As the Medical Research Institute of the University of Ghana, NMIMR is administered under the auspices of the NCTE, Ministry of Education. Moreover, as a semi-autonomous governing body under the jurisdiction of the Ministry of Education, it receives a budgetary allotment from the Central Government. As a research Institute, it already enjoys a high reputation, the researchers' general level of expertise is not felt to be a problem. This Plan will augment the research activities of an existing facility; and, thus, additional employees will not be needed for basic implementation. Therefore, implementation should present no internal problems for the Administrative organization of NMIMR.

(3) Project Budget

As the sponsor of numerous Medical Research Institute in West Africa, NMIMR has received the acclaim of both WHO and donor agencies, alike. Since 18 years of its establishment, NMIMR has been in the fruit of Japans technical cooperation.

However, the economy of Ghana has now a stagnated stage of growth. For NMIMR to maintain its basic independence, it is felt a change is needed and that this would be an opportune time.

As described earlier, NMIMR receives only a recurrent allocation from MOE, due to the Restructuring of the Government and its semi-autonomous nature. Eighty percent of that allotment goes to cover personnel costs. As a result, the costs of equipment, research, test reagents, etc. must come from such sources as trusts and donors conducting joint research. These sources vary widely from year to year. However; through extension and renovation of the research environment for the proposed Project, such outside support may be continued and greater support may be expected in the days ahead.

Maintenance cost for the biohazard air conditioning system used this project, such as electric bills and the periodic cost of replacing parts, will need to be paid by NMIMR. It is felt the cost of parts replacement and supplementary maintenance over a 3 to 5 year period will be considerable. In addition, it is recommended that periodic inspection and maintenance for the air conditioning system will be covered by engineer from local agents on service contract basis.

With a view of reducing costs under the requested scale of Plan, the required Maintenance/Operation cost has been pre-estimated to be in the range of US\$ 65,000 per annum. This amount represents about 9% of the actual expenditure for NMIMR in 1995. As recommend on 4-2; as a semi-autonomous body, NMIMR has affirmed it foresees the possibility for increased revenues hereafter, as it gradually increases it level of self support.

(4) Maintenance Organization

There are 7 maintenance staff at NMIMR and half of these have been responsible for the upkeep and maintenance of existing facilities since it was established. Therefore, their level of expertise is deemed sufficient for facility/electrical maintenance. The plan includes OJT based technical guidance for operation and maintenance on the stage of installation and testing for the biohazard air conditioning system. Moreover after completion of facilities, the plan includes training for equipment use, and all

preventive maintenance and training programs thereafter, non maintenance problems are anticipated.

Daily maintenance and inspection for test equipment will be performed by users of each position at the unit level. Equipment in need of repair will be sent to the Maintenance Section. However, almost of machinery has electronic circuits that are hard to troubleshoot and hard to replace in the event of a breakdown. Even in Japan, such repairs are performed by the maker's engineers, who have the required expertise for the repair of medical equipment. Therefore, such maintenance and repairs will be entrusted to engineers of the maker's local outlets.

4-1-2 Effects of Project Implementation

The proposed Project Plan is expected to have the following results:

(1) Improvement of Safety

The theme of NMIMR has been greatly influenced by social needs and advances in medical technology. From the outset, cooperative efforts, which lead to an increased capacity to research dangerous pathogens causing organisms, beginning in the fields of Nutrition and Pathology and leading to the study of Virology and Immunology, has had ever increasing importance. At present, such research is being conducted in the existing laboratory on the P-2 level. The researchers are exposed to the danger of contamination by dangerous pathogens in the environment. Moreover, the spreading of such pathogens/ contaminated organisms can hinder research and operations throughout the NMIMR. Even in the animal laboratories, breeding animals with experiment laboratory animals (due to space limitations) or in the corridors, for example, has raised the fear that animals will be contaminated, and this contamination will be spread to researchers or observers.

When the proposed Plan is implemented, the Laboratory Safety Manual of WHO will be employed to insure safe conditions in the P-3 Research Labs and Animal Labs, alike. Especially important is the fact that safe and efficient procedures will be possible for research on HIV/AIDS and ant-drug TB programs of the "Infectious Disease Prevention Project". By the efficient use of existing research space, and isolation of dangerous procedures on the second floor of the existing facility, the danger of contamination by unexpected visitors can be avoided.

(2) Training & Research - The Dissemination of Research Results

Inspections and the training of Inspectors for the Department of Public Health have been conducted by the NMIMR. Through the Expanded Prevention of Immunization Program (EPI), 17 inspectors were trained for 20 days each year by Virology Unit. In the Parasitology Unit, 6 students, 3 National Service Trainees and 3 from MOH/WHO and others, for a total of 18 participants from outside agencies are received. For all those training and other functions, space have been a burden for laboratory in charge.

Under the proposed Plan, Training Labs will facilitate 12 participants, without hindering the present style of interdepartmental activities. A Laboratory Diagnosis Training Course for research and training in the fields of Parasitic Disease, HIV/AIDS and STD planned by the next Technical Cooperation.

The planned Conference Hall can feature a Seminar/Symposium for 120 participants. At present, the NMIMR has sponsored seminars for 100 participants, 2 or 3 times a year including JICA seminar,. There is now talk of offering a monthly "in-house" seminar on a scale of 100 participants, even if it must be open door for all related organizations. It is also expected that DANIDA, which is now developing a preventive vaccine network for malaria, and WHO/UNICEF, which have supported the NMIMR's activities, will actively participate in these programs.

In the same vein, it will even be possible for other JICA's technical cooperation (re: the MCH/Health Service project) to benefit from training and research conducted by NMIMR's instructors.

Through implementation of this plan and all those activities, in collaboration with the MOH, Ghana's national health policies, such as public health or disease prevention, will be improved. The scope of NMIMR's activities will be enlarged to benefit outside participants, and a great contribution will be made in Public Health for the people of Ghana and all of West Africa.

(3) Composition of the Infectious Disease Prevention Network

The actual research and the research environment of the NMIMR is highly esteemed by WHO/UNICEF and USAID/DANIDA. USAID has dispatched research fellow to the Nutrition Unit and DANIDA has sent researchers to the Immunology Unit on malaria prevention research. They are also fostering more intensive cooperation in the

exchange of information and technology among neighboring countries, under the auspices of WHO/UNICEF. JICA also sponsored Third Country Training, technological exchanges between Kenya and Zambia are moving ahead in the area of infectious disease prevention.

Also; in 1989, the NMIMR was designated a Regional Reference Laboratory by EPI (WHO) in the area of Polio Diagnosis. The JICA conducted annually Third Country Training Course on Laboratory Diagnosis, has continued over a period of 5 years beginning in 1991. The program has involved 60 participants from 12 countries. Followed those activities, information is now being exchanged over the Internet with related institutions.

Therefore, implementation of this plan can promote activities more widely available and create a network for the exchange of information on infectious disease. Moreover, it is anticipated that a global network will be created, permitting the exchange of information, especially that which allows for the prevention of recurrences and new outbreaks. This network will extend not only throughout Africa, but will ultimately be international in scale.

(4) The GII/DAC Strategy for New Development

As mentioned, Ghana is one of the countries selected under Japan's Global Issues Initiative (GII) program, which is aimed at major field of the HIV/AIDS and population growth. It is also a major recipient of aid under the DAC New Development Strategy, in the area of public health for children. Since Ghana has a high infant mortality rate, a special effort is needed for reform in the area of children's' health. For this reason, the MOH implemented a national program which consolidates the Expanded Programme on Immunization (EPI) and the Children's Control of Diarrhoea Diseases Program (CDD). Through JICA's technical cooperation, the NMIMR has made contributions by sponsoring Laboratory diagnosis training course on EPI by Virology Unit. Also the area of Oral Rehydration Salt (ORS), NMIMR has contributed research and development through Nutrition Unit.

Thus, this Project is in accord with Japan's foreign policies both in the area of disease prevention and the area of public health for children, and we have great hopes for the future.

4-2 Recommendations

(1) Linkage with MOH / Related Agencies

The NMIMR has come to be a hallmark as a centre of excellence for Medical Research under MOE. Its research findings and results are widely acclaimed from many related institutions, and as 20s of its research papers are published in medical journals each year. Hereafter, working with MOH, it is hoped that NMIMR will restore the research-based components of diagnosis and Epidemiology to the field of public health administration.

In this regard, the government of Ghana is attempting to reform of MOH, with the objective of implementing reformed public health and infectious disease prevention programs. Concerned agencies are cooperating with the government in an all out effort to achieve these goals. For example, family planning and public health guidance for mothers and children are recognized needs requiring the total cooperation of concerned agencies in alleviating the problems of AIDS and overpopulation. Moreover, the problems of controlling widespread epidemics, preserving safe drinking water, improving public sanitation and poverty alleviation are also problems that will require a broad-based cooperative effort.

Till now, MOH has had to implement many programmes as a "piecemeal" basis, relying on financial support from a variety of donors. Hereafter, programs by MOH should be implemented through a collaborative effort involving the programs of other agencies.

In this regard, monthly meetings are already being held by donors on the subject of public health programme. Information is being exchanged and joint fundraising efforts are being made. In addition, the United Nations issued a joint communique on AIDS (UNAIDS) in 1996, and programs were put in place the following year. Thus, through renewed efforts to strengthen its ties with other agencies, clarifying its policies and social roles, the NMIMR must continue to take an aggressive and progressive stance, from its choice of research topics to dissemination of its findings.

(2) Establishing a Safety Control Committee

In establishing bio-hazard prevention countermeasures for the P3 lab facilities, there are "software" (administrative) requirements to be considered, as well as the typical

"hardware" requirements. While the NMIMR has ultimate responsibility for the administration of safety programs, a "Biohazards Committee" will need to be established for the implementation of safety programs. The Committee will function as an administrative-regulatory body, and will be responsible for such matters as classifying disease-causing organisms by their level of danger, drafting facility safety standards, and designating laboratory spaces to be used for biohazards experiments.

In addition, it would be desirable to establish a "Safety Observation Committee" to insure that safety measures established for this facility are actually observed. This Committee will act independently of the Center's Research Department and will exist apart from its "chain of command". Moreover; to maintain an objective stance, it will have to include members from outside agencies.

For researchers in the field of dangerous disease-producing organisms, the education and training components of the public health administration programs illustrated below will be pursued in the days ahead. In this regard, the "software" biohazard countermeasures will be required and, if a public health administrative system is set up at the Noguchi Research Center, Ghana should be the prototype of that system.

Table 4-1 Safety Control: Education/Training & Health Control

Education & Training
1) Safety Handling Measure and Technic for Micro-organisms by Level of Risk 2) Knowledge and Technic for Physical Hazard Containment 3) Knowledge and Technic for Biological Hazard Containment 4) Knowledge of the Level of Risk of Experiments To Be Performed 5) Knowledge of Safety Measure for Emergency
Health Control
1) Health Diagnosis: The Director of Institute shall make health diagnoses of lab technicians at regular intervals of not more than 1 year, before and after experiments are performed.
2) Preventive Treatment Measures: When experimenters use pathogens, the Director shall review preventive treatment measures before the experiments are begun and shall insure the necessary resistive materials, vaccines and blood serum have been prepared. He shall make health diagnoses at regular intervals, once every 6 months or less.

<p>3) Preservation of Blood Samples:</p> <p>When experiments are conducted at the P3 level or above, the Director shall collect blood samples from the lab technicians before the experiment begins, and will preserve these samples for 2 years from the date the experiment ends.</p>
<p>4) Danger of Contamination:</p> <p>When there is a fear of contamination of major laboratory cultures or contamination within a laboratory, the Director shall promptly make health diagnoses of the technicians involved and take appropriate measures.</p>
<p>5) Preservation of Diagnostic Results:</p> <p>The Director shall record and preserve diagnostic results.</p>
<p>6) Inspection & Required Equipment:</p> <p>When experimenters are affected by any of the following conditions or a report relating to #7 (below) is received, the Director shall promptly take appropriate measures while conducting an investigation.</p> <ul style="list-style-type: none"> (a) Foreign matter is accidentally imbibed or inhaled (b) An experimenter's skin is contaminated by foreign matter (c) A laboratory or its environs is contaminated or, when a major culture is dropped, causing contamination in the Director's presence

Source: Hitachi, "Summary of Biohazard Countermeasures"

(3) Budget Sustainability by Self-reliance

The NMIMR is a semi-autonomous organization and is expected to improve its healthy balance of payments by self-reliance. As the NMIMR has a strong public character as a research institute, the need for the government to fund the NMIMR's activities until the market matures is pointed out. However under these circumstances, it is essential for the NMIMR to increase its own income and to reduce its expenditure to achieve a healthy balance of payments for the smooth running of its activities or Sustainability.

Possible measures to increase the income and reducing the maintenance cost of the NMIMR are examined as follows;

1) Income Improvement Measures

a) external Sale of Laboratory Animals

There is already a precedence of the NMIMR selling the animals which it has bred to research organizations in Ghana and abroad. While it is important for ordinary

in-house laboratory animal facilities to strike a balance between supply (breeding) and demand (testing), there can be a surplus of animals due to unconformity between the research cycle and number of animal bred. It is, therefore, possible to externally sell the surplus animals and the income can be redirected to funding part of the maintenance cost.

b) Training of Inspectors and Researchers

Past records show that the training conducted by Virology Unit earned income in 1995. Even though it may prove difficult to charge a training fee for theses sent by such related organizations as the Ministry, it should be possible for semi-autonomous organizations to mutually charge a training fee. The planned training laboratory under the Project can be used to generate extra income through its training activities.

c) Collection of Sample Test Fee

Various research units have earned income in the past through entrusted testing although the amount is small. the NMIMR has an excellent reputation for sample testing and can conduct testing on bacilli which cannot be identified by the routine tests of other research institutes and laboratories. the NMIMR is also capable of double checking pathogens which ordinary testing methods often fail to notice.

d) Research Grants from other Organization

The NMIMR has received a string of grants from many external organizations. For example it has received a WHO grant for Polio research and a USAID grant for HIV/AIDS research. In the past, however, the actual size of each grant has tended to be rather small and irregular. The introduction of the P3 laboratories and animal laboratories dealing with infectious diseases, which are quite rare in West Africa, under the Project will most likely lead to increased grant income through international joint research and entrusted research.

e) Admission Fees for Seminars and Training Courses

The existing conference room was rented out in 1995 to generate income. Many of the conferences held in Accra currently use a hotel or the British Council. while the University of Ghana has large lecture theaters, they lack air-conditioning and Audio-visual equipment. It will be possible to produce the total income to finance its maintenance cost if the planned new conference hall is rented out for seminars, academic conferences and training courses in the public health and medical care fields.

2) Maintenance and Running Cost Reduction Measures

The running cost of the P3 laboratories and the animal laboratory facilities is mainly accounted for by the cost of electricity to run the air-conditioning system. One major principle to reduce the power consumption is to stop running the system when it is not required. the central air-conditioning system used by the existing research facilities should be suggested at night and on cool days except for those rooms where precision equipment and reagents are kept.

The power consumption level of the air-conditioning system is largely determined by the actual load level. Regular cleaning of the filters and outdoor cooling (condensers) is essential as clogging of the filters and dirty components deteriorate the cooling performance of the system, resulting in increased power consumption. Such preventive maintenance as daily cleaning and regular checks are effective in reducing the spare parts and repair costs by preventing equipment breakdowns. If it is possible to conclude a maintenance agreement with a local agent, a maintenance system combining such an agent and the maintenance staff of the NMIMR will become possible and the lives of the equipment and systems will certainly be lengthened.

ANNEX

1. Member List of the Survey Team
2. Survey Schedule
3. List of Party Concerned in the Recipient Country
4. Minutes of Discussion
5. Cost Estimation Borne by the Recipient Country
6. Other Relevant Data
7. References

1. Member List of the Survey Team

1. Member List of the Survey Team

1-1 Basic Survey Team

- | | |
|--|---|
| (1) Team Leader | Mr.Takeshi NARUSE
Director, First Project Study Division,
Grant Aid Project Study Department,
Japan International Cooperation Agency (JICA) |
| (2) Technical Adviser | Dr.Kazuyoshi SUGIYAMA
Chief, Division of Biosafety,
National Institute of Infectious Diseases (NIID) |
| (3) Technical Adviser | Dr.Toshihiko ASANO
Chief, Division of Experimental animal Research,
National Institute of Infectious Diseases (NIID) |
| (4) Coordinator | Mr.Hiroshi NAKAMURA
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| (5) Project Manager/Operation and Maintenance Planner | Mr.Koji KODAMA
Kume Sekkei Co., Ltd. |
| (6) Architecture Planner | Mr.Tetsuro NISHIMURA
Kume Sekkei Co., Ltd. |
| (7) Equipment Planner | Mr.Yukio CHUJO
BINKO LTD. |
| (8) Mechanical Planner | Mr.Masayuki ORIMA
Kume Sekkei Co., Ltd. |
| (9) Procurement Planner | Mr.Seikichi SEKINE
Kume Sekkei Co., Ltd. |

1-2 Consultation on Draft Report

- | | |
|--|---|
| (1) Team Leader | Dr.Toshihiko ASANO
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| (2) Technical Adviser | Dr.Kazuyoshi SUGIYAMA
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| (5) Architecture Planner | Mr.Tetsuro NISHIMURA
Kume Sekkei Co., Ltd. |
| (6) Equipment Planner | Mr.Yukio CHUJO
BINKO LTD. |

2. Survey Schedule

2. Survey Schedule

2-1 Basic Design Study (Aug. 4 - Aug. 31, 1997 : 28 days)

(1) The First Half of Survey

No.	DATE	DAY	ACTIVITIES
1	Aug.04	Mon	11:30 Left Tokyo by JL411, Officials (Mr.Naruse, Dr.Sugiyama Dr.Asano, Mr.Nakamura) 12:50 Left Tokyo by KL862, Consultants (Mr.Kodama, Mr.Nishimura, Mr.Chujou, Mr.Orima) 16:45 Officials arrived at Amsterdam 16:50 Consultants arrived at Amsterdam
2	05	Tue	14:30 Left Amsterdam by KL589, all members 19:00 Arr. at Accra 21:00 Meeting on Schedule at Hotel
3	06	Wed	08:30 JICA Ghana Office, Courtesy Call and 10:00 EOJ, Courtesy Call 14:00 MOE, MOH, MOF, Courtesy Call and Exp. of Inception Report
4	07	Thu	09:30 NMIMR, Courtesy Call and Facility Inspection 10:30 Vice Chancellor of UG, Courtesy Call 15:00 Meeting with Technical Cooperation Team
5	08	Fri	09:30 NMIMR, Concept Workshop 15:30 NMIMR, Explanation of Inception Report and Design Concept
6	09	Sat	Filing Documents / Check of Questionnaire
7	10	Sun	Visiting Accra city, Kolre-bu Hospital, etc.
8	11	Mon	09:00 NMIMR, Explanation of Aid System / Procedure 14:30 NMIMR, Unit Discussion (P3 / Animal Facility) 18:00 Arr of Q/S (Mr.Sekine) by SR264
9	12	Tue	09:30 NMIMR, Explanation of Plan / Equipment / Maint-Cost 14:30 NMIMR, Survey of Existing Facility / Equipment
10	13	Wed	09:30 Visiting of UG Campus 14:30 NMIMR, Explanation of Minutes Draft
11	14	Thu	09:30 NMIMR, Discussion on Minutes Draft 15:00 Team Meeting 20:00 Left Accra by KL586, Officials

(2) The Latter Half of Survey

No.	DATE	DAY	ACTIVITIES-1 (Technical Survey)	ACTIVITIES-2 (Background Survey)
12	15	Fri	09:00 Arrangement of Soil Survey 10:30 NMIMR, Facility Survey 14:30 cont. 15:30 NMIMR, Mtg. with Director 17:00 Contract on Soil Survey 18:00 Internal Meeting	← 10:30 NMIMR, Maintenance 11:00 Interview to Local Agents 16:00 Data (Legon Bookshop) ← ←
13	16	Sat	10:00 Planning of Renovation 11:30 Survey of Construction Site 17:00 Internal Meeting	09:00 DAC Team (Prof.Ohbayasi) 10:30 Data(Omari/EPP Bookshop) 15:30 Data Input /Survey Chart ←
14	17	Sun	11:30 Planning of Renovation	09:00 Data input /Survey Chart 15:30 TC Team (Prof.Nara)
15	18	Mon	09:30 UG, Development Div. (Infrastructure /Costs) 14:30 NMIMR, Elec/AC/Maint 18:00 Internal Meeting	10:30 UG, Development Div. 11:45 NMIMR, Water/Drainage 16:30 NMIMR, Financial Aspects ←
16	19	Tue	09:30 NMIMR, Explantrn of Plan 14:30 UGH, Collection of QS 17:45 Internal Meeting	← 16:00 JICA, Data Collection ←
17	20	Wed	09:30 Visiting GHANA SANYO 10:30 cont. Tema Port, etc 14:30 New EOJ Building Site 18:00 Internal Meeting	09:30 NMIMR, Adj of Schedule 10:30 MOH /HRU, Data Collection 16:00 MOE, Attend Signing on Minutes
18	21	Thu	09:30 NMIMR, Check on remedy of facility and plant 14:00 Survey of Feed Prep Hut 18:10 Internal Meeting	09:30 NMIMR, Collecting QS 10:00 MOH, Plan Div, (data) 11:30 MOE Finance Div, (data) 14:00 WHO/Library ←
19	22	Fri	09:00 NMIMR, Survey of Facility	09:00 NMIMR, Finance 10:00 MOE, Finance Div. 10:30 MOH, Planning Div. 11:00 MOC, Design Div.

				11:30 MOF, Statistic Office
			14:30 Survey of Materials	15:00 NMIMR, Finance
			18:00 Internal Meeting	←
20	23	Sat	10:00 Visiting City Market	10:00 Data Filing /Input
			18:00 Internal Meeting	←
21	24	Sun	10:00 Planning (P3 /AH)	10:00 Data Filing /Input
			18:00 Internal Meeting	←
22	25	Mon	09:30 Vtg Public Health Labo	←
			10:30 Vtg Medical School	←
			14:00 Vtg Ridge Hospital	14:30 UG QS Office
			18:00 Internal Meeting	←
23	26	Tue	09:00 NMIMR, Explantn of Plans	←
			14:00 UG, Development Div.	←
			15:30 Vtg Construction Site, UG	←
			18:00 Internal Meeting	←
24	27	Wed	09:00 NMIMR, Exp of Plan	←
			14:30 NMIMR, Additional Survey	14:30 UNDP, Interview
				15:00 MOF, Data Collection
				15:30 MOCH, Building Code
			18:00 Internal Meeting	16:30 Environment Cont Agency
25	28	Thu	09:00 NMIMR, Explanation and Discussion of Renovation Plan	
			14:00 NMIMR, Maintenance Workshop	
			18:00 Internal Meeting	
26	29	Fri	09:00 NMIMR, Final Meeting	
			10:30 JICA Ghana Office, Survey Report	
			11:30 EOJ, Survey Report	
			14:00 Additional Survey	←
			21:30 Left Accra by KL590 (M/S. Kodama, Nishimura, Chujo, Orima)	20:35 Left Accra by SR265 (Mr. Sekine)
27	30	Sat	06:25 Arr at Amsterdam	06:25 Arr at Zurich
			15:05 Left Amsterdam by KL867	12:50 Left Zurich by SR168
28	31	Sun	09:35 Arr at Kansai Airport	07:40 Arr at Naritta Airport

2-2 Draft Report (Nov. 02 - Nov. 13, 1997:12 days)

NO.	DATE	DAY	ACTIVITIES
1	Nov.02	Sun	12:55 Left Tokyo by SR169, all members 17:40 Arr. at Zurich
2	03	Mon	12:00 Left Zurich by SR264, all members 19:05 Arr. at Accra, Meeting of Survey Schedule
3	04	Tue	08:30 Meeting at JICA Ghana Office 10:00 Embassy of Japan, Courtesy Call 11:00 MOF, Courtesy Call and Draft Explanation 14:15 MOE, Courtesy Call and Draft Explanation 16:00 MOH, Courtesy Call and Draft Explanation
4	05	Wed	10:00 NMIMR, Courtesy Call and Draft Explanation of Scheduling 14:00 NMIMR, Draft Explanation
5	06	Thu	09:30 Vice Chancellor of UG, Courtesy Call and Explanation 10:30 NMIMR, Unit Discussions 14:30 NMIMR, All Discussion
6	07	Fri	09:30 UNDP, Survey of Aid Trend 10:30 Visiting Public Health Reference Labo. 14:30 NMIMR, Seminar on Bio-Safety by Dr.Sugiyama
7	08	Sat	Filing Documents
8	09	Sun	Filing Documents
9	10	Mon	10:30 NMIMR, Discussion on Minutes 15:30 Visiting Research Institute for Medicinal Plant
10	11	Tue	10:00 Report to JICA Ghana Office 12:00 Luncheon by Team Leader 15:00 MOE, Finance Div. Additional Survey 20:55 Left Accra by SR265, all members
11	12	Wed	05:55 Arr. at Zurich 12:50 Left Zurich by SR168
12	13	Thu	08:40 Arr. at Narita

3. List of Party Concerned in the Recipient Country

Annex 3 List of Parties Concerned in the Ghana

Embassy of Japan

HE.Akihisa Tanaka	Ambassador
Mr.Eiichi Suzuki	Counselor
Mr.Hajime Senoo	First Secretary
Mr.Nobuyuki Hashimoto	Special Assistant

JICA Ghana Office

Mr.Akio Yatsubayashi	Resident Representative
Mr.Osamu Kosegawa	Deputy Resident Representative
Mr.Shinya Tomonari	Assistant Resident Representative
Mr.Matthew Dally	Assistant Program Officer
Dr.Kijo Deura	Project Team Leader, Project for the Improvement of Health In-Service Training System and Programme
Mr.Yoshioka	Project Coordinator, as above
Ms.Miyuki Yamazaki	Project Coordinator, Small Scale Irrigation Promotion Project

Ministry of Finance

Dr.W.Adote	Director, IERD: International Economic Relations Division
Mrs.Agnes Batsa	Head, Bilateral Unit, IERD
Mr.Kwasi Opoku	Desk Officer, IERD
Mr.E. Nkansah	Schedule Officer, IERD
Mr.Edward Arkoh	Ghana Statistical Service

Ministry of Education

Dr.Ibn Chambas	Deputy Minister
Mr.J.S.Dalrymple-Hayfron	Chief Director
Prof.A.N.E.Deheer-Amissah	Executive Secretary, NCTE: National Council for Tertiary Education
Dr.S.A.Seidu	Deputy Executive Secretary, NCTE
Mr.Isaac M. Eshun	Director, RIM: Research & Information Management

Mr.Kwabena Sarfo	Deputy Director, PBME: Planning Budgeting, Monitoring and Evaluation
Mr.T.M.K.Ayakwa	Asst. Director, PBME

Ministry of Health

Dr.Eunice B. Ammissah	Minister
Hon. N.P. Acheampong	Deputy Minister
Mr.Samuel Nuamah Donkor	Deputy Minister
Dr. S.O. Sackey	Acting Director, PHU: Public Health Unit Director, DCU: Disease Control Unit
Dr.Sam Bugri	Public Health
Mr.Asamani-Darko	Health Service Administrator, EPI Unit
Mr. Anoy Boriey	Co-ordinator, National NID Unit
Dr. H. Odoi-Agyarko	Head, MCH/FP Unit
Dr.William Addotey	Director
Dr.Jennifer Brown-Aryez	Director, PPU: Policy Planing Unit
Mr.George Dakpallah	Head, Budget
Mr.Isaac Adams	Head, IMEU: Information, Monitoring and Evaluation Unit

Public Health Reference Laboratory

Dr.A.Asamoah-Adu	Director
Ms.Velonica Bekoe	Vice Director

Ridge Hospital

Dr.A.W.D.Laryea	Specialist In-charge (Acting Director)
Mr.Asamani-Darko	Health Service Administrator

Ministry of Works and Housing

Mr. D.K.Boateng	Director, Chief Technical Advisor (Works)
Mr.Ashogi A.Damlini	Chief Technical Advisor (Housing)
Mr.Frank Kori Dei	Senior Engineer
Mr.Joe Mensha	Supervisor

University of Ghana

Prof.Ivan Addae-Mensah	Vice Chancellor
Development Office	
Mr.Abubaka Al-Hassan	Director
Mr.Philip Azundow	Chief Architect

Mr.Yaw Osei-Opuku	Chief Quantity Surveyor
Estate Organization	
Mr.Nana Abu-Bonsra	Acting Executive Engineer
Medical School	
Prof.S.K.Qwasu	Dean
Prof.A.S.Ayetey	Vice Dean, Anatomy
Mr.V.O.Korda	Senior Asst. Resistrer

Noguchi Memorial Institute for Medical Research: NMIMR

Prof.F.K.Nkrumah	Director
Dr.A.K.Nyarko	Deputy Director, Research Fellow
Mr.Opoku-Agyakwa	Administration Secretary
Mr.S.K.Tachi	Chief Administration Assistant

Research Units

Dr.B.D.Akanmori	Research Fellow, Head (Immunology Unit)
Dr.N-A.Ankrah	Senior Research Fellow, Head (Clinical Pathology Unit)
Dr.George Armah	Research Fellow, Head (Electron Microscopy Unit)
Dr.P.Akpedonu/Ms.	Senior Research Fellow, Head (Bacteriology Unit)
Dr.P.Addo/Ms.	Junior Research Fellow , Head (Laboratory Animals Unit)
Mr.A.Appawu	Research Fellow, Head (Parasitology Unit)
Dr.K.M.Bosompem	Research Fellow, (Parasitology Unit)
Dr.M.Oseki-Kwasi	Research Fellow, Head (Virology Unit)
Dr.K.A.Koram	Research Fellow, Acting Head (Epidemiology Unit)
Dr.Samuel Dunyo	Senior Medical Officer,(MOH)
Dr.M.Armah-Klemesu/Ms.	Research Fellow, Acting Head (Nutrition Unit)

Visiting Researchers

Dr.Daniel Maxwell	Visiting Research Fellow(Nutrition Unit) Rockefeller Fellow, Food Consumption and Nutrition Division International Food Policy Research Institute(IFPRI)
Dr.Jorgen Kurtzhals	Visiting Research Fellow(Parasitology Unit) Malaria Control, WHO/DANIDA
Dr.Behr/Ms.	Visiting Researcher (Parasitology Unit) Malaria Control, EU

Finance Unit

Mr.Appiah Aborah	Chief Accountant Asst.
------------------	------------------------

Mr.D.K.Ofosu	Senior Accountant Asst.
Library	
Mr.A.V.T.Azu	Prin. Library Asst.
Maintenance Section	
Mr.S.K.A.Jones	Senior Works Superintendent(Plumb.)
Mr.E.O.Lamptey	Senior Works superintendent(A/C)
Mr.L.A-Acheampong	Senior works superintendent(Elec.)
Mr.S.Neequaye	Works Superintendent(Plumb.)
Mr.J.A.Kortei	Senior Works Superintendent(A/C)
Mr.E.Nartey	Senior Works Superintendent(Elec.)
Mr.S.M.Adjei	TM. G-II(Carpentry)
JICA Expert	
Dr.Toshiya Kamiya	Project Team Leader
Mr.Koji Kanemaru	Coordinator
JICA Mission Members	
Dr.Toshikatsu Hagiwara	Chief, Dept. of Virology I, National Institute of Infectious Diseases: NIID
Ms.Yuuko Kasumi	Bacteria Section, National Institute of Tuberculosis
Prof.Somei Kojima	Dept. of Parasitology, Institute of Medical Science, Tokyo University
Dr.Takesi Nara	Parasitology Dept. Faculty of Medicine, Juntendo University
Other Organisations	
Ms.Comfort Tetteh	Asst. Resident Representative, UNDP
Mr.E.Ampem Darko	Library Asst. WHO
Local Agents	
Mr.Saib	OMAN FOFOR
Mr.K.Ofori	Managing Director,DPI Engineering Ltd.
Mr.E.A.Lartey	Managing Director,Ghana Sanyo Co.,Ltd.
Mr.Arazi	Managing Director,COMTEL Ltd.

4. Minutes of Discussion

**MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE NOGUCHI MEMORIAL INSTITUTE
REHABILITATION AND EXTENSION PROJECT
IN
THE REPUBLIC OF GHANA**

In response to the request from the Government of Ghana, the Government of Japan decided to conduct a Basic Design Study on the Noguchi Memorial Institute Rehabilitation and Extension Project (hereinafter referred to as "the Project"), and entrusted the Study to the Japan International Cooperation Agency(JICA).

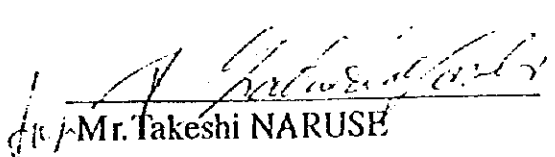
JICA sent to the Republic of Ghana a study team (hereinafter referred to as "the Team"), which was headed by Mr.Takeshi NARUSE, Director, First Project Study Division, Grant Aid Project Study Department, JICA from August 5 to August 14, 1997.


The Team held discussions with relevant officials of the Government of Ghana and conducted site surveys of the Institute.

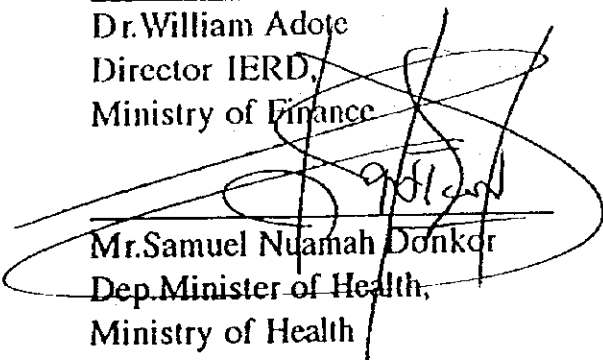
In the course of the discussions and site surveys, both parties confirmed the main items described on the attached sheets.

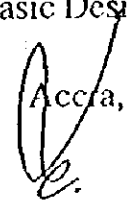
The Team will proceed to further work and prepare the Basic Design Study Report.

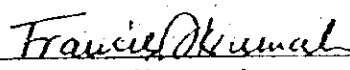
20
Accra, August 14, 1997


Mr.Takeshi NARUSE
Leader,
Basic Design Study Team, JICA


Dr.William Adote
Director IERD,
Ministry of Finance


Mr.Samuel Nuamah Donkor
Dep.Minister of Health,
Ministry of Health


Mr.J.S.Darlrymple Hayfron
Chief Director,
Ministry of Education


Prof.F.K. Nkrumah.
Noguchi Memorial Institute
for Medical Research

ATTACHMENT

1. Objective

The objective of the Grant Aid for the Project is to improve laboratory conditions at The Noguchi Memorial Institute for Medical Research (hereinafter referred to as NMIMR) through procurement of medical equipment, construction and renovation of the physical facilities.

2. Project Site and Tentative Layout Plan

Noguchi Memorial Institute for Medical Research (NMIMR)

(See Annex 1)

3. Responsible and Executing Organization.

(1) Responsible Agency - The Ministry of Education

(2) Executing Agency - Noguchi Memorial Institute for Medical Research

4. The result of the consensus workshop

Consensus workshop with participatory approach was held at the NMIMR (The participants are listed in Annex 3). The concept of the Project was reviewed and confirmed in the discussions. The result is summarized in Annex 2.

5. Items requested by the Government of Ghana.

(1) After discussions with the Team, the following items were finally requested by the Government of Ghana .

1) Procurement of Equipment:

Details of items are listed in Annex 4

2) Extension and Rehabilitation of the Buildings and Facilities:

Details of items are listed in Annex 5

However, the final items of the Grant Aid will be decided after further studies.

(2) The equipment will be selected by the basic criteria attached as Annex 6

6. Japan's Grant Aid System

1) The Government of Ghana has understood Japan's Grant Aid System as described in Annex 7.

2) The Government of Ghana will take necessary measures, as described in Annex 8 for smooth implementation of the Grant Aid, on condition that the Grant Aid by the Government of Japan is extended to the Project.

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7. Schedule of the Study

- 1) The consultants will carry out further studies in the Republic of Ghana until August 29, 1997.
- 2) JICA will prepare a draft Basic Design Report in English and dispatch a mission in order to explain its contents around October, 1997.
- 3) In case the contents of the draft report are accepted in principle by the Government of Ghana, JICA will complete the final report and send it to the Government of Ghana around January, 1998.

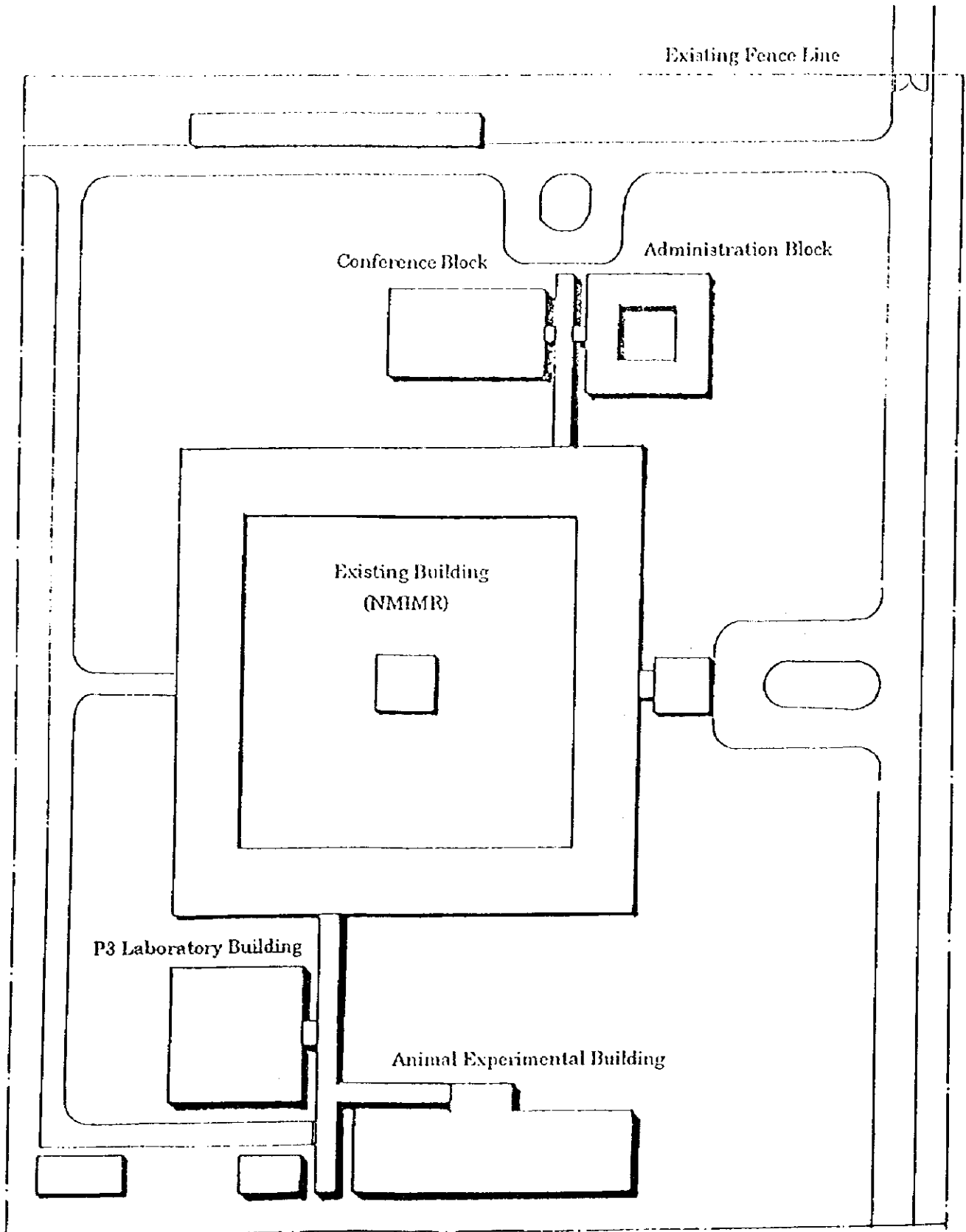
8. Other Relevant Issues

- (1) The Ghana side confirmed that the necessary recurrent cost and personnel for the P3 Laboratory and Animal Experimental facility shall be secured by the Ghana side.
- (2) In order to operate safely and maintain the P3 Laboratory and Animal Experimental facility newly provided in NMIMR, the Ghana side shall organize a system such as a Biosafety Committee.
- (3) Based on the concept of the centralizing system which will improve the function of NMIMR, the renovation of such laboratories will be planned for the purpose of rational use of equipment and facilities.
- (4) The Ghana side requested for training of its personnel for the operation and maintenance of the P3 Laboratory and Animal Experimental facility as "Kenshuin" in Japan.
- (5) Both Ghana side and Japan side mutually understood the necessity of establishing collaborative linkages between NMIMR and Ministries such as MoE and MoH in order to fully utilize the research findings emanating from NMIMR for the improvement of public health in Ghana.

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Project Site and Tentative Layout Plan



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The result of the Consensus workshop with participatory approach

Core Problem : Inadequate infectious disease diagnosis, monitoring and control.

Direct Beneficiary : The Ghanaian

Target Year : Not yet decided, but should be decided in an earlier part of the Project. (The Grant Aid : 1999 The Technical Cooperation : 2003)

Preconditions : NMIMR, MoE and MoH should establish Linkages.

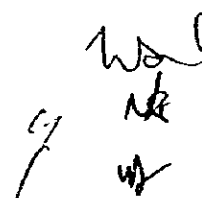
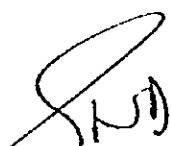
Narrative Summary
Overall Goal
To enhance health delivery and Services in Ghana
Project Purpose
To improve diagnosis, monitoring and control of infectious diseases in Ghana
Outputs
1) To delineate the epidemiology and pathogenesis of HIV/AIDS and STD in Ghana.
2) To establish a reference laboratory for research into tuberculosis (TB) in Ghana.
3) To delineate the epidemiology and pathogenesis of vaccine preventable diseases, and thus contribute to vaccine development.
4) To contribute to the manpower development in infectious disease at the NMIMR through training.
Activities
To be decided in the Technical Cooperation.

Inputs	
Ghana side	Japan Side
1) Human Resource	1) Construction and Equipment of a P3 laboratory
2) Land	2) Construction and Equipment of a new Animals Unit
3) Running Cost	3) Construction and Equipment of the Administrative Block and Conference facility
4) Custom duty	4) Replacement of the Electron Microscopy
5) Quick clearance of Gov.procedures	5) Rehabilitation of the Existing Facility

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Participation List of the Workshop



WORKSHOP ON JICA'S BASIC DESIGN STUDY MISSION ON THE
NOGUCHI MEMORIAL INSTITUTE REHABILITATION
AND EXTENSION PROJECT

VENUE: NOGUCHI, CONFERENCE RM NO. 102

DATE: 8/8/97

ATTENDANCE LIST

	<u>NAME</u>	<u>POSITION</u>	<u>ORGANI.</u>
1.	Mr. S. A. Seidu		N.C.T.E.
2.	Mr. Isaac M. Eshun	Director	SRIMPR
3.	Mr. Kwabena Sarfo	Dep. Director	PBME
4.	Mr. V. O. Nortey		M.O.E.
5.	Prof. A.N.E. Deheer-Amissah		N.C.T.E.
6.	Mr. Said Al-Hussein		M.O.H.
7.	Dr. S. O. Sackey	Ag. Director	P.H.D. , MOH.
8.	Mr. Philip Azundow	Architect	Univ. of Ghana
9.	Prof. F.K. Nkrumah	Director	NMIMR
10.	Dr. A.K. Nyarko	Dep. Director	NMIMR
11.	Mr. Opoku-Agyakwa	Admin. Sec.	NMIMR
12.	Dr. K.M. Bosompem	Res. Fellow	NMIMR
13.	Dr. B.D. Akanmori	Res. Fellow	NMIMR
14.	Dr. George Armah	Res. Fellow	NMIMR
15.	Dr. Samuel Dunyo	Snr.Med. Offi.	NMIMR
16.	Dr. P. Akpedonu	Snr.Res.Fellow	NMIMR
17.	Dr. P. Addo	Jnr.Res.Fellow	NMIMR
18.	Mr. A. Appawu	Res. Fellow	NMIMR
19.	Dr. K.A. Koram	Res. Fellow	NMIMR
20.	Mr. Shinya Tomonari	Asst. Res. Rep.	Jica Office
21.	Mr. Matthew Dally	Asst. Prog. Offr.	Jica Office

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22.	Takeshi Nanise	Leader	Jica Mission
23.	Hiroshi Nakamura	Member	Jica Mission
24.	Toshihiko Asano	Member	Jica Mission
25.	Kazuyoshi Sugiyama	Member	Jica Mission
26.	Koji Kodama	Member	Jica Mission
27.	Masayuki Orima	Member	Jica Mission
28.	Yukio Chujo	Member	Jica Mission
29.	Tetsuro Nishimura	Member	Jica Mission

30.	Dr. Toshiya Kamiya	Team Leader	JICA Project
31.	Mr. Koji Kanemaru	Co-ordinator	JICA Project

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Procurement of Equipment

A; High Priority

B; Middle Priority

C; Low Priority

P3 Laboratory					
Room	Requested Equipment	Req. Q'ty	Priority		
			A	B	C
Lab (Conventional)	Autoclave (middle, horizontal)	1			0
	Autoclave (middle, vertical)	1			0
	Central Lab. Table	1	0		
	Centrifuge (3,000 rpm)	1		0	
	Incubator	1		0	
	Biological microscope	1		0	
	Reagent Store	1		0	
	Sink	1	0		
	Side Table	1	0		
Lab(P2)	Autoclave (middle, horizontal)	1			0
	Autoclave (middle, vertical)	1	0		
	Central Lab. Table	1	0		
	Centrifuge (3,000 rpm)	1	0		
	High speed centrifuge (20,000 rpm)	1	0		
	Incubator	1		0	
	CO2 Incubator	1			0
	Reagent Store	1	0		
	Refrigerator	1			0
	Freezer (-35°C)	1	0		
	Safety Cabinet, IIA	1	0		
Cold room	Equipment shelf	1			0
Washing room	Equipment shelf	1	0		
	Sink	1	0		
	Side Table	1	0		
Freezer room	Freezer (-130°C, horizontal)	1			0
Lab-2(P3) (HIV, Others)	Autoclave (middle, horizontal)	1	0		
	Autoclave (middle, vertical)	1		0	
	Autoclave, large	1		0	
	Central Lab. Table	1	0		
	Bio-Centrifuge (3,000 rpm)	1	0		
	CO2 Incubator	1	0		
	Freezer (-85°C, horizontal)	1	0		
	Freezer (-35°C)	1	0		

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Room	Requested Equipment	Req. Q'ty	Priority		
			A	B	C
Lab-2(P3) (HIV, Others)(cont.)	Bio-High speed centrifuge (20,000 rpm)	1		0	
	Incubator	1			0
	Pass Box	1	0		
	Phase contrast microscope	1	0		
	Reagent Store	1	0		
	Safety Cabinet (IIB type)	1	0		
	Bio-Ultracentrifuge (40,000 rpm)	1		0	
	Liquid Nitrogen Canister	1	0		
	Anemometer	1	0		
Lab-1(P3) (TB)	Autoclave (middle, horizontal)	1	0		
	Autoclave (middle, vertical)	1	0		
	Side Lab. Table	2	0		
	Bio-Centrifuge (3,000 rpm)	1	0		
	Freezer (-85°C, horizontal, middle)	1	0		
	Incubator(middle)	1	0		
	Pass Box	1	0		
	Biological microscope	1	0		
	Reagent Store	1	0		
	Safety Cabinet (IIB type)	1	0		
	Bio-Sink	1		0	
Precision Inst. Lab	Central Table	1	0		
	Sink	1	0		
	Side Table	1	0		
	Computer	1	0		
	DNA Sequencer	1	0		
	ELISA Reader	1	0		
	Flow cytometer	1		0	
	PCR System	1			0
Training Lab	Teaching microscope (5 person)	1			0
	Biological Microscope	5	0		
	Central Table	2	0		
	Sink	1	0		
	Side Table	1	0		
Maintenance shop	Working Bench	2		0	
	Machine for Maintenance	1	0		

Electron Microscope Dept.					
	Electron Microscope Transmission type, without scanning function	1	0		
	Specimen Preparation Equipment	1		0	
	Ultra Microtome	1		0	
	Knife Maker	1			0

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Laboratory Animal Unit					
Room	Requested Equipment	Req. Q'ty	Priority		
			A	B	C
Grasscutter(Growing and Breeding)	Breeding Shelf	2	0		
	Grasscutter Reproduction Cage	25	0		
	Breeding Shelf	5	0		
	Grasscutter Cage	150	0(116)		0(34)
	Grasscutter Balance	1	0		
Rabbit (Growing and Breeding)	Breeding Shelf	2	0		
	Rabbit Reproduction Cage	12	0		
	Breeding Shelf	3	0		
	Rabbit Cage	45	0		
	Breeding Shelf	3	0		
	Rabbit Cage	27	0		
	Rabbit Balance	1	0		
Guinea Pig (Growing and Breeding)	Breeding Shelf	2	0		
	Guinea Pig Reproduction Cage	16	0		
	Breeding Shelf	4	0		
	Guinea Pig Cage	80	0(25)		0(53)
	Guinea Pig Balance	1	0		
Hamster and Rat(Growing and Breeding)	Breeding Shelf	1	0		
	Rat Cage (for Hamster)	16			0(16)
	Breeding Shelf	2	0		
	Rat Cage (for Hamster)	50	0		
	Rack	4	0		
	Rat SPF Cage	64	0		
Mouse(Growing and Breeding)	Hamster and Rat Balance	1	0		
	Rack for Mouse	6	0		
	Mouse SPF Cage	150	0(13)		0(137)
Stock and Preparation	Mouse Balance	1	0		
	ERECTA Shelf	2	0		
	Porta Washer with Disinfectant	1		0	
	Working Table	5		0	
	Feed Container Carry	2		0	
	Cart	2	0		
	Hand wash Stand	2			0
Office	Freezer (-5 C degree)	1	0		
	Office Desk w/Chair, large	1		0	
	Office Desk w/Chair, small	2			0
	Steel Cabinet	2			0
	Filing Cabinet	2		0	
	No-Frost Refrigerator	1		0	
	Sink with Drain board	1	0		
	Personal Computer w/printer	2	0(1)		0(1)
	Conference Table	1			0
	Swivel Office Chair	5			0
	Television with Video System	1			0
Diagnostic and Autopsy	Copy Machine	1		0	
	Laboratory Side Table	2	0		
	Sink with Drain board	1	0		
	Working Chair	4	0		
	Hanging Cabinet (3 pcs/set)	1		0	

Room	Requested Equipment	Req Q'ty	Priority		
			A	B	C
Diagnostic and Autopsy(cont.)	Steel Cabinet	1		0	
	Filing Cabinet	1		0	
	Medical Refrigerator	1	0		
	Biological Clean Bench	1	0		
	Working Table	2	0		
	Microscope for Two Observer	1	0		
	Biological Microscope	1	0		
	ELISA System	1	0		
	Dissecting Microscope	1	0		
	LN2 Tank	1	0		
	Vinyl Isolation	3	0		
	Electrophoresis	1	0		
	Cryostat Microtome	1			0
	Refrigerated Centrifuge, floor type	1	0		
	Constant Temperature Bath	1	0		
	Animal Holder	1	0		
	Dissecting Set	2	0(1)		0(1)
	Boiling Sterilizer	1	0		
	Medical Freezer	1	0		
	Cooled Incubator	1	0		
	CO2 Incubator	1	0		
	Clinical thermometer	1	0		
Dressing Room	Dressing Locker	2	0		
	Drain board	1	0		
Washing and Sterilizing	High Pressure Steam Sterilizer	1	0		
	Pass Box	1	0		
	Shallow Sink	1	0		
	Deep Sink	1	0		
	Drain/Dry Shelf	3	0		
	Sterilizing Box, small	5		0	
	Sterilizing Box, large	5		0	
	Rubber Spatula	10			0
	Working Table	2			0
	Steel Cabinet	2			0
	Cart	3		0	
	Porta Washer with Disinfectant	1		0	
	Washing machine	1		0	
Post mortem	Medical Freezer for Carcass	1	0		
Warehouse (Equipment)	Steel Rack(large)	1		0	
	Steel Rack(medium)	1		0	
Stock	Steel Rack	3		0	
	Cart	1	0(2)		0(2)
	Feed Container Carry	1			0
Dissection/ Operation	Ice Machine	1		0	
	Medical Refrigerator	1			0
	Cooled Incubator	1			0
	ERECTA Shelf	1			0
	Steel Cabinet	1			0
	Hand wash Stand	1		0	

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Room	Requested Equipment	Req. Q'ty	Priority		
			A	B	C
Dissection/ Operation	Breeding Shelf	2		0	
	Mouse SPF Cage	72		0	
	Breeding Shelf	2		0	
Mouse and Rat Experiment	Rat SPF Cage	50		0	
	Breeding Shelf	2		0	
	Guinea Pig Cage	32		0	
Guinea Pig and Rabbit Experiment	Breeding Shelf	2		0	
	Rabbit Cage	24		0	
	Laboratory Side Table	4	0		
	Working Table	2		0	
	Wagon	2			0
	Mouse Automatic Balance	1	0		
	Rat Automatic Balance	2	0		
	Rabbit Automatic Balance	1	0		
	Boiling Sterilizer	2			0
	Dissecting Set	4			0
	Mouse Holder	2	0		
	Rat Holder	2	0		
	Operating Table	10	0		
	Dissecting Table for Rabbit	2	0		
	Animal Scaffold	1	0		
	Animal Hair Clipper with Blades	2	0(1)		0(1)
Dressing Room	Dressing Locker	2	0		
	Drain board	1	0		
	Totoo Machine	1	0		
Mouse and Rat Infection Experiment	Jet Fog (Atomizer)	2	0		
	BBH Unit (Mouse)	1	0		
	Mouse SPF Cage	16	0		
	BBH Unit (Rat)	1	0		
	Rat SPF Cage	16	0		
	BBH Unit (Guinea Pig)	1	0		
	FRP Guinea Pig Hanging Cage	16	0		
	BBH Unit (Rabbit)	1	0		
	FRP Rabbit Hanging Cage	9	0		
	Filter Unit with Silencer	1	0		
	Negative Rack with Blower	1	0		
Guinea Pig and Rabbit Infection Experiment	Mouse SPF Cage	25	0		
	Negative Rack with Blower	1	0		
	Rat SPF Cage	16	0		
	Negative Rack with Blower	2	0		
	Guinea Pig Cage	9	0		
	Rabbit Cage	9	0		
	Biological safety Cabinet	1	0		
	Working Table	2		0	
	Wagon	2			0
	Hand wash Stand	1		0	
	Mouse Automatic Balance	1	0		
	Rat Automatic Balance	2	0		
	Rabbit Automatic Balance	1	0		
	Autoclave, small	3	0		
	Pass Box	1	0		

Room	Requested Equipment	Req. Q'ty	Priority		
			A	B	C
Monkey Breeding Room	Negative Rack with Blower	2	0		
	Monkey Cage	4			0
	Working Table	1		0	
	Hand wash Stand	1	0		
Monkey Experiment and Quarantine	Wagon	1		0	
	Automatic Balance	1	0		
	Boiling Sterilize	1	0		
	Dissecting Set	2	0(1)		0(1)
	Catching Gloves	5	0(3)		0(2)
	Catching Net	2	0		
	Face Guard (Goggles)	2	0		
	Sink with Drain board	1	0		
	Freezer for carcass	1	0		
Raw Materials Stock Manufacturing	Storage	1	0		
	Steel Rack	2			0
	Steel Cabinet	1			0
	Pellet Mill	1	0		
	Dryer	1			0
	Working Table	2	0		
	Digital Balance	1	0		
	Cart	2	0		
Fowl (Breeding)	Pen for Fowls	1			0
Sheep (Breeding)	Fold for Sheep	1			0
Others	Laboratory Wear, etc.	10	0		

Existing Facilities					
	Central table	5		0	
	Safety cabinet	3		0	
	Replacement parts for existing equipment	1		0	

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Extension and Rehabilitation of Buildings and Facilities

Construction of the P3 Laboratory A

※ To provide safe laboratory facilities for HIV and TB research

Construction of Animal Experimental facility A

※ To keep the safety of the Laboratories away from the contamination by experimental animals, and also to meet the world standard.

Renovation of Laboratories B

※ To improve safety and function of existing laboratories

Construction of the Conference facility B

※ To improve research result dissemination and utilization of research findings through seminars and conferences

Construction of the Administrative Block C

※ To expand research laboratories space within existing building

A: High Priority

B: Middle Priority

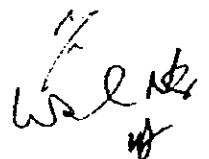
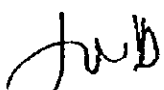
C: Low Priority

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Basic Criteria for Selection of Equipment

- 1) Equipment which will be included in the Grant Aid
 - (a) Equipment which is necessary in order to implement the Technical Cooperation
 - (b) Equipment whose operation and maintenance cost is affordable by the Ghana side
 - (c) Equipment which is utilized in order to achieve the Project Purpose
- 2) Equipment which will be excluded from the Grant Aid
 - (a) Equipment uses of which are beyond the scope of the Purpose of the Project
 - (b) Equipment which is existing and can be shared by each Unit with the renovation plan.
 - (c) Equipment whose maintenance is difficult technically and financially
 - (d) Equipment which is possible to purchase locally by the NMIMR
 - (e) Equipment which should be procured by the Technical Cooperation



Japan's Grant Aid Program

1. Japan's Grant Aid Procedures

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

Application (Request made by a recipient country)

Study (Preliminary Study / Basic Design Study conducted by JICA)

Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)

Determination of Implementation (Exchange of Notes between the both Governments)

Implementation (Implementation of the Project)

(2) Firstly, an application or a request for a project made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to see whether or not it is suitable for Japan's Grant Aid. If the request is deemed suitable, the Government of Japan entrusts a study on the request to JICA (Japan International Cooperation Agency).

Secondly, JICA conducts the Study (Basic Design Study), using a Japanese consulting firm. If the background and objective of the requested project are not clear, a Preliminary Study is conducted prior to a Basic Design Study.

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 approved by the Cabinet becomes official when pledged by the Exchange of Notes signed by the both Governments.

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

2. Contents of the Study

(1) Contents of the Study

The purpose of the Study (Preliminary Study/Basic Design Study) conducted on a project requested by JICA is to provide a basic document necessary for appraisal of the project by the Japanese Government. The

Study are as follows:

- a) to confirm background, objectives, benefits of the project and also institutional capacity of agencies concerned of the recipient country necessary for project implementation,
- b) to evaluate appropriateness of the Project for the Grant Aid Scheme from a technical, social and economical point of view,
- c) to confirm items agreed on by the both parties concerning a basic concept of the project,
- d) to prepare a basic design of the project,
- e) to estimate cost involved in the project.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request.

Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes.

(2) Selecting (a) Consulting Firm(s)

For smooth implementation of the study, JICA uses (a) consulting firm(s) registered. JICA selects (a) firm(s) through proposals submitted by firms which are interested. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference made by JICA.

The consulting firm(s) used for the study is (are) recommended by JICA to a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is repeated.

(3) Status of a Preliminary Study in the Grant Aid Program

A Preliminary Study is conducted during the second step of a project formulation & preparation as mentioned above.

A result of the study will be utilized in Japan to decide if the Project is to be suitable for a Basic Design Study

Based on the result of the Basic Design Study, the Government would proceed to the stage of decision making process (appraisal and approval).

It is important to notice that at the stage of Preliminary Study, no commitment is made by the Japanese side concerning the realization of the Project in the scheme of Grant Aid Program.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non reimbursable funds needed to procure facilities, equipment and services for economic

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and social development of the country under the following principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not in a form of donation or such.

(2) Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes by both Governments, in which the objectives of the Project, period of execution, conditions and amount of the Grant etc. are confirmed.

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

(4) Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased.

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

However the prime contractors, namely, consulting, contractor and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons.)

(5) Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude into contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

(6) Undertakings required to the Government of the recipient country

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

- a) to secure land necessary for the sites of the project and to clear and level the land prior to commencement of the construction work,
- b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) to secure buildings prior to the installation work in case the Project is providing equipment,

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- 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 facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for their operation and maintenance as well as to bear all expenses other than those to be borne by the Grant Aid.

(8) Re-export

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

(9) Banking Arrangement (B/A)

- a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in an authorized foreign exchange 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 Government of the recipient country or its designated authority under the contracts verified.
- 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.

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