

Fig 2-20 Experiment and Lecture Building-1: Elevation

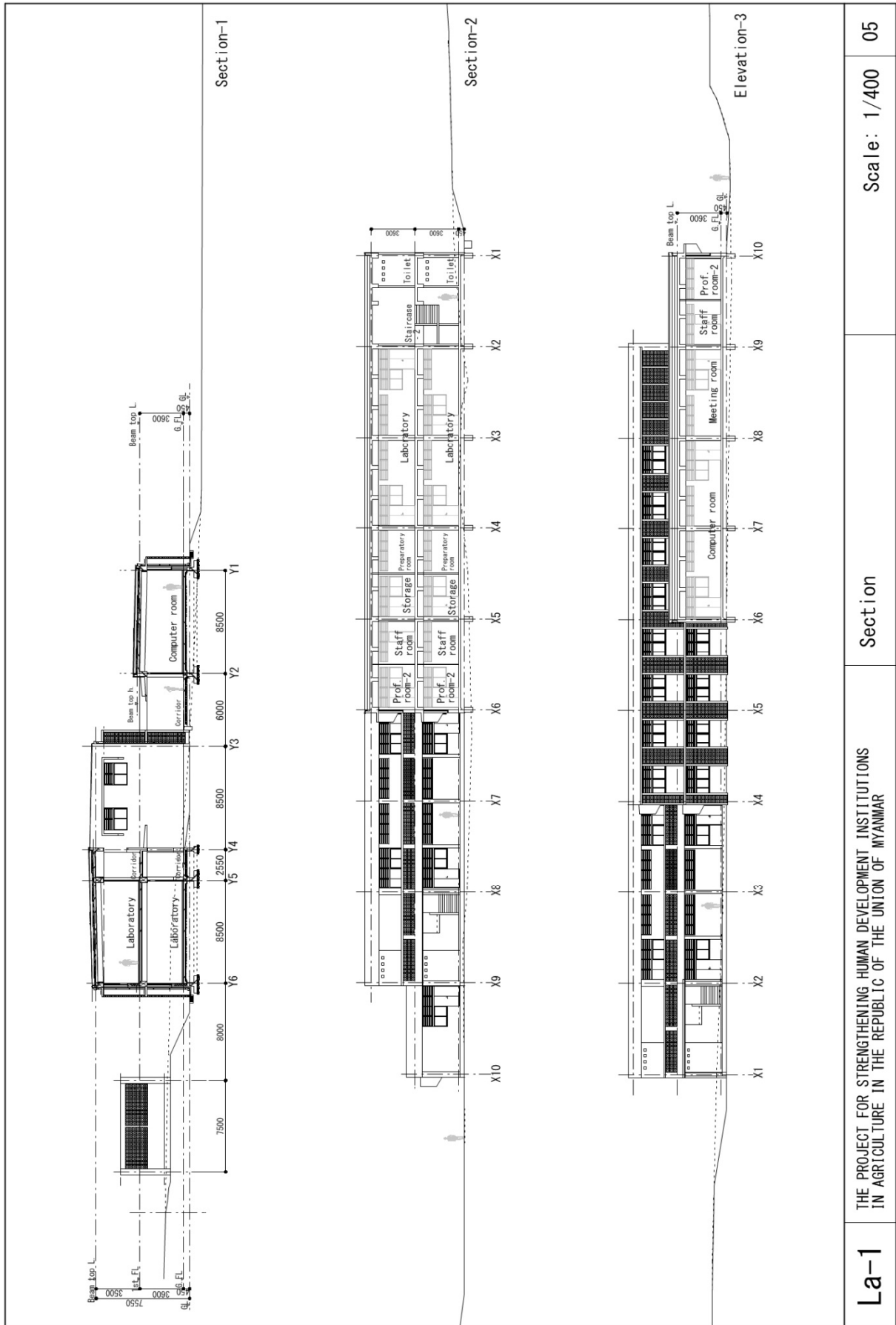
04

Scale: 1/400

Elevation

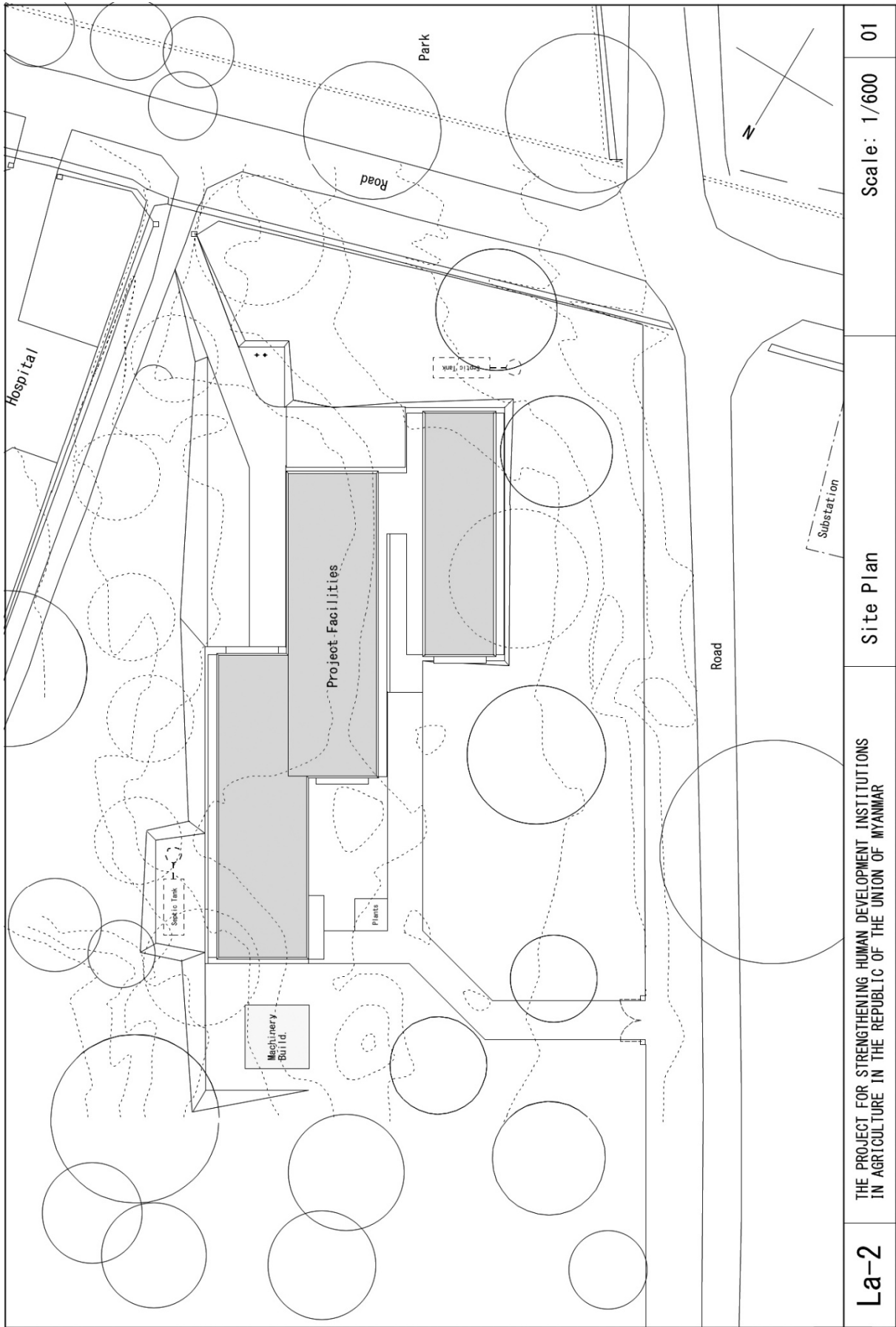
THE PROJECT FOR STRENGTHENING HUMAN DEVELOPMENT INSTITUTIONS
IN AGRICULTURE IN THE REPUBLIC OF THE UNION OF MYANMAR

La-1



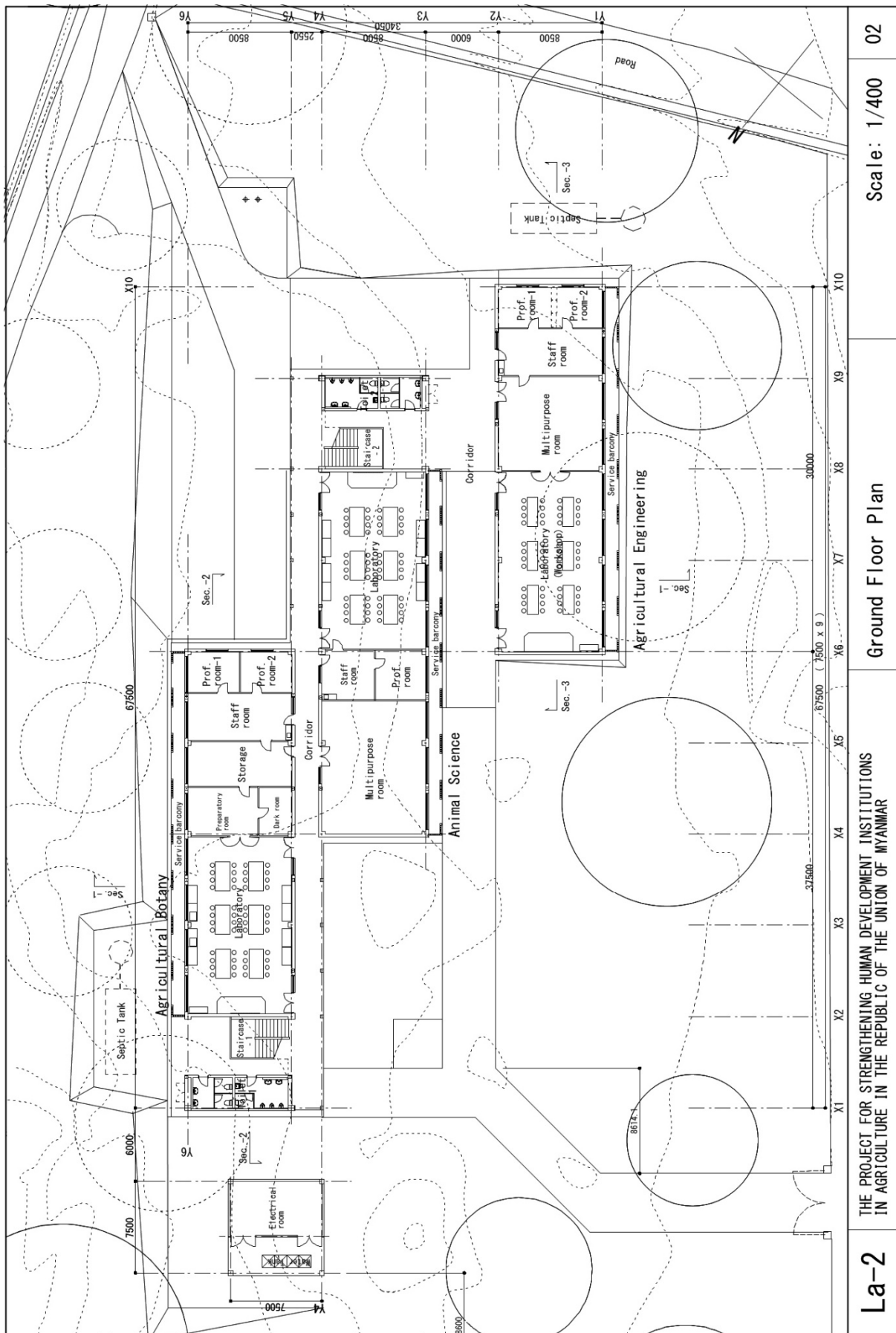
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|------|--|---------|--------------|----|
| La-1 | THE PROJECT FOR STRENGTHENING HUMAN DEVELOPMENT INSTITUTIONS IN AGRICULTURE IN THE REPUBLIC OF THE UNION OF MYANMAR | Section | Scale: 1/400 | 05 |
|------|--|---------|--------------|----|

Fig 2-21 Experiment and Lecture Building-1: Cross section



| | | | | |
|------|--|-----------|--------------|----|
| La-2 | THE PROJECT FOR STRENGTHENING HUMAN DEVELOPMENT INSTITUTIONS IN AGRICULTURE IN THE REPUBLIC OF THE UNION OF MYANMAR | Site Plan | Scale: 1/600 | 01 |
|------|--|-----------|--------------|----|

Fig 2-22 Experiment and Lecture Building-2: Site plan



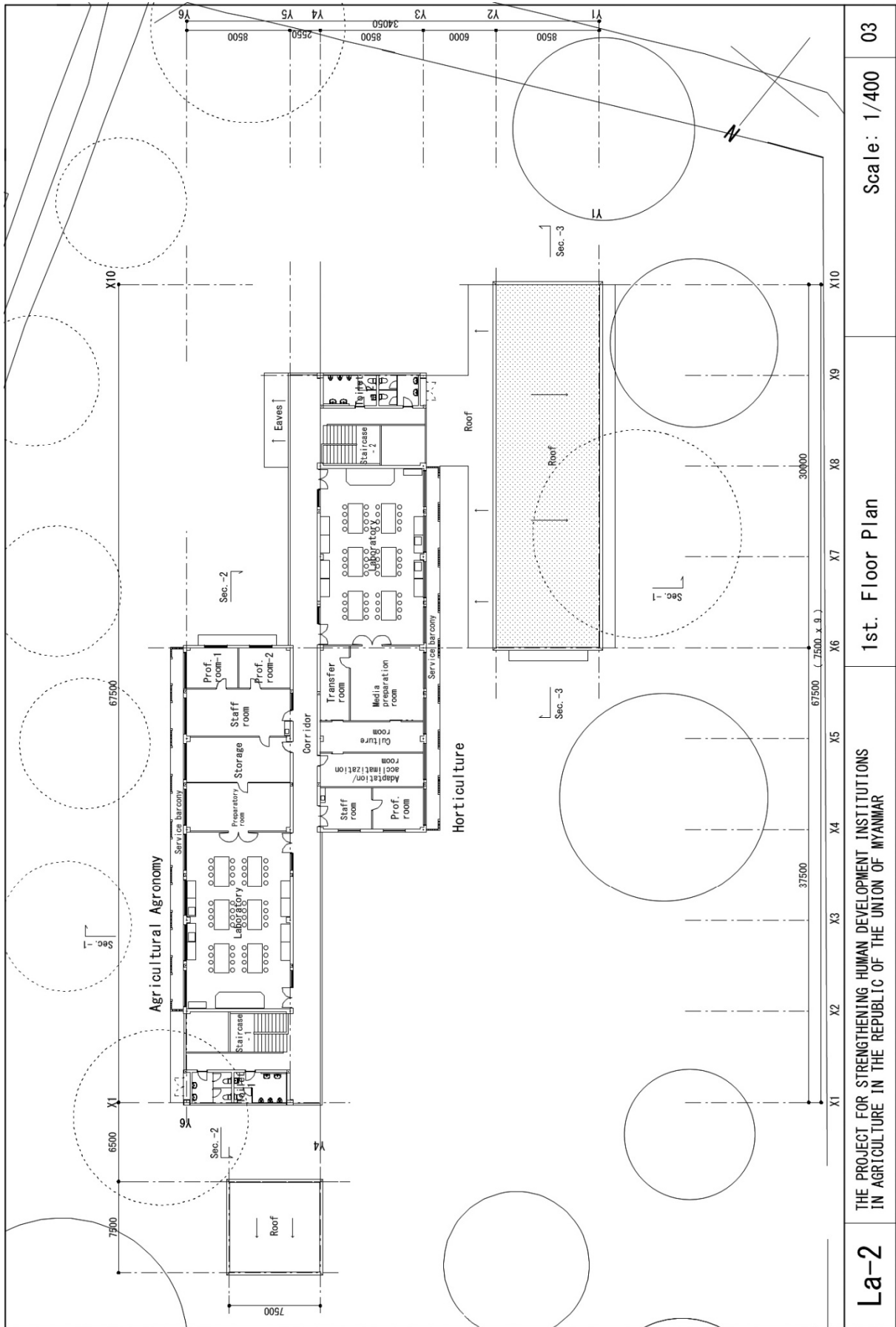
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Ground Floor Plan

THE PROJECT FOR STRENGTHENING HUMAN DEVELOPMENT INSTITUTIONS IN AGRICULTURE IN THE REPUBLIC OF THE UNION OF MYANMAR

La-2

Fig 2-23 Experiment and Lecture Building-2: Ground floor plan



Scale: 1/400

1st. Floor Plan

THE PROJECT FOR STRENGTHENING HUMAN DEVELOPMENT INSTITUTIONS
IN AGRICULTURE IN THE REPUBLIC OF THE UNION OF MYANMAR

La-2

03

Fig 2-24 Experiment and Lecture Building-2: 1st floor plan

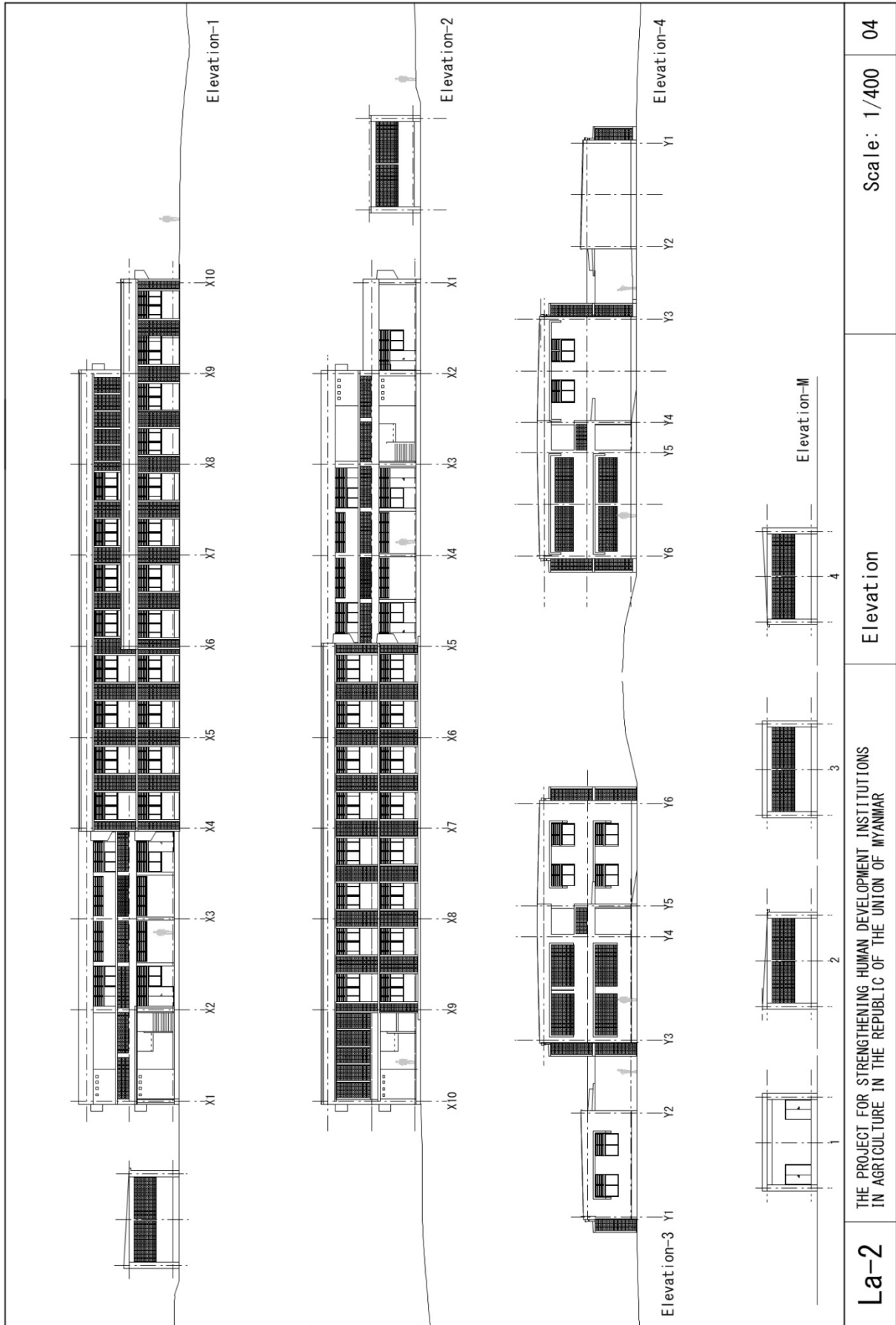


Fig 2-25 Experiment and Lecture Building-2: Elevation

La-2

THE PROJECT FOR STRENGTHENING HUMAN DEVELOPMENT INSTITUTIONS
IN AGRICULTURE IN THE REPUBLIC OF THE UNION OF MYANMAR

Elevation

Scale: 1/400

04

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The implementation policy adopted for this Project is cost-efficient implementation of the construction work. In order to realize this policy, an execution schedule which enables such cost-efficient implementation will be prepared. For the preparation of such an execution plan, details of the construction work provided in the design documents will be studied thoroughly before implementation of the work and decisions on the work period, materials to be used, construction methods, quality control methods and safety and sanitation management will be made after a comprehensive study has been conducted of the socio-economic factors, including customs, culture and laws/regulations, and the natural conditions in Myanmar, the intentions of YAU, the environment in the surrounding area and the conditions of the construction sites, labor force and the characteristics of the construction work.

While the basic policy will be local procurement of labor and construction equipment and materials, procurement in Japan will be allowed for such items for which procurement in Japan is advantageous because the poor quality or availability of locally available items may hinder implementation of this Project or because of the ease of post-handover maintenance. An appropriate transport plan will be prepared for the items to be procured in Japan by comprehensively studying various conditions including the time of delivery and transport route and methods so that any delay in delivery of the items will not delay the progress of the construction work.

(1) Organizational Structure for Project Implementation including Myanmar Organizations

The Project Team recommends the organizational structure for project implementation including Myanmar organizations (draft) shown in fig 2-27 for execution management, in order to facilitate implementation of the construction work. The implementing organization on the Myanmar side will be YAU. Its Estate Engineering Department, which will bear responsibility for coordination and implementation of the execution management, will cooperate with the representatives elected from each of the nine departments concerned to facilitate project implementation.

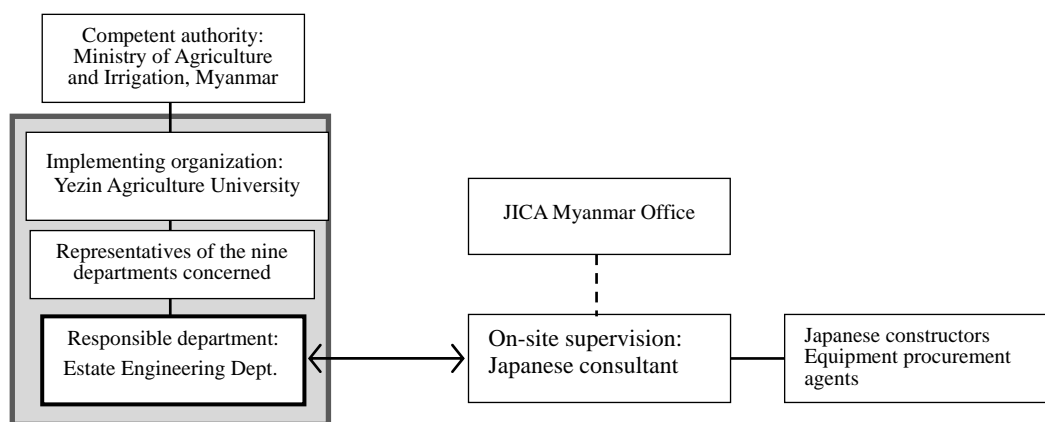


Fig.2-27 Organizational structure for implementation of execution management (draft)

(2) Need for the Dispatch of Engineers

Certain construction materials and equipment (mostly fixtures and interior finishing materials) will be procured from Japan in this Project. The methods used in Japan will be used for the work and installation of such materials and equipment. Therefore, Japanese engineers (one in sash work and the other in interior finish work) will be dispatched to the sites to ensure the quality and accuracy of the work.

2-2-4-2 Implementation Conditions

(1) Matters Requiring Attention Concerning Execution of the Work

1) Employment of Constructors and Labor

The Myanmar side informed the Project Team that contracts for large-scale construction projects of a scale larger than a certain level in Nai Pyi Taw, where the project sites are located, were awarded to construction companies in Yangon which had ample experience in implementing large-scale projects and had high level technologies and contracting capacity, because few construction companies in Nai Pyi Taw had high technological capacity or execution capacity to contract such large-scale projects. Therefore, it is expected that construction companies in Yangon will be employed for the implementation of this project.

Workers are usually brought from Yangon to implement construction projects because the number of experienced workers available in Nai Pyi Taw is limited.

2) Safety Measures

Once the execution of this Project begins, construction vehicles will use the roads on the university campus frequently used by students, staff and visitors to the university. In order to ensure the safety of the university students, staff and third parties during the construction period, the organizational structure for safety management will be reinforced and an appropriate number of security personnel will be assigned to appropriate locations in the university.

3) Matters Requiring Attention in Procurement

Many cheap and extremely poor-quality materials, equipment and products are found on the Myanmar market. Since the materials and equipment to be used in this Project must satisfy certain requirements for quality and durability and will require after-sale services including repairs and provision of spare parts, it is likely that only limited materials and equipment will be procured locally for this Project.

In addition, as imported materials and equipment are traded in Yangon, transport costs from Yangon to Nai Pyi Taw are added to the prices of materials and equipment when they are procured in Nai Pyi Taw. Therefore, the prices of imported goods in Nai Pyi Taw are 20 to 30 % higher than the prices of the same goods in Yangon. Procurement quantities and delivery dates

2-2-4-3 Scope of Works

The table 2-08 shows the scopes of the construction work/procurement installation work of the Japanese and Myanmar sides in this Project.

Table 2-08 Scopes of construction and procurement/installation works

| Description of the construction/procurement work | Japanese side | Myanmar side |
|---|---------------|--------------|
| 1. Reservation of the construction sites and the sites for temporary yards | | ○ |
| 2. Removal of obstacles and leveling of the construction areas (removal of objects such as trees and roots, and facilities and equipment which may become obstacles to project implementation) | | ○ |
| 3. Reservation of safe passageways for university students, employees and visitors during the construction period | | ○ |
| 4. Costs associated with application for permits and approvals required for the construction work | | ○ |
| 5. Construction of facilities, procurement and installation of equipment in the contract documents | ○ | |
| 6. Basic works including extension of public infrastructure (such as electric power transmission cables and water supply pipes) to the project sites | | ○ |
| 7. Electrical, water supply and sewerage, and mechanical equipment works included in the contract documents | ○ | |
| 8. Extension of telephone and LAN cables to the project sites | | ○ |
| 9. Procurement of furniture included in the contract documents | ○ | |
| 10. Procurement of furniture, appliances and equipment not included in the contract documents (e.g. desks, chairs, curtains, blinds and cabinets) | | ○ |
| 11. Payment of commissions to Japanese foreign exchange bank in accordance with the Banking Arrangement (B/A) (advisory fees on the authorization to pay (A/P) and commission paid) | | ○ |
| 12. Procedures for the import and customs clearance of materials and equipment procured for this project (procedures required for tax-exemption at the port of unloading and provision of assistance for customs clearance) | | ○ |
| 13. Provision of assistance for application for entry into, stay in and exit from Myanmar to Japanese project personnel | | ○ |
| 14. Customs duty and domestic tax exemption in Myanmar for Japanese project personnel | | ○ |
| 15. Appropriate and effective use and maintenance of the facilities constructed and equipment procured under the Grant Aid Cooperation Scheme | | ○ |
| 16. Payment of the costs of facility construction and installation of equipment not included in the grant aid cooperation | | ○ |

2-2-4-4 Consultant Supervision**(1) Construction Supervision Plan**

A person with sufficient technical knowledge and experience to understand the details of the construction designs and work in this Project will be dispatched to the project site as the construction supervisor. The basic responsibility of the Japanese consultant dispatched to the project site (field manager) will be to confirm that the actual construction work is implemented in accordance with the design documents, using the construction supervision plan prepared by the consultant.

One matter requiring special attention during construction supervision will be smooth implementation

of the construction work while conforming to the procedures required for grant aid projects and general laws and rules, and the systems and customs of Myanmar. Short-term supervisors (*e.g.* experts in structures and facilities) will be dispatched to the project site when supervision by such supervisors is required during the construction, not only to confirm whether construction supervision has been implemented appropriately, but also to provide assistance to the field manager. A project support system will be established in Japan to solve problems encountered during the construction work and problems such as delay of the construction work as a means to reinforce the construction supervision system.

The table 2-09 shows the main components of construction supervision.

Table 2-09 Main components of construction supervision

| | |
|---|--|
| Explanation of the policy on project supervision | The supervisor will explain the system and policy of construction supervision to the Myanmar side and hold discussions on the system and policy with the Myanmar side before the commencement of construction supervision. |
| Understanding of the contents of the design documents | The supervisor will examine the technical aspects of the design documents from the viewpoint of satisfying the quality (including shapes, dimensions, finish, functions and performance) provided in the design documents (and also respond to written questions submitted by the Myanmar side). |
| Examination of the execution drawings and reporting of the examination results | The supervisor will examine the working drawings, construction materials, facilities/equipment and samples submitted or recommended by the contractors and confirm that they conform to the provisions of the design documents as stipulated in the design documents. |
| Confirmation of the implementation of work in conformity with the design documents by comparison of actual work with the design documents | The supervisor will confirm the conformity of work implemented by the contractors to the provisions of the design documents not only by the methods stipulated in the design documents, but also by other reasonable methods appropriate for the nature of the work to be confirmed, including visual inspection, sampling and examination of the quality control records submitted by the contractors. |
| Reporting of the results of the above-mentioned activities | If the supervisor concludes that certain work has not been implemented as provided in the design documents from the results of comparison of the actual work and the design documents, the supervisor shall inform the contractor concerned of the inconformity and request the contractor to implement the work concerned in accordance with the provisions of the design documents. |
| Submission of construction supervision reports | The supervisor will hold monthly meetings with the contractors to acquire accurate information on the progress of the construction work and problems encountered in the work and take measures to solve the problems when necessary. The supervisor shall submit monthly reports to the Myanmar side and JICA. The supervisor shall submit a Completion Report upon completion of the construction work. |
| Miscellaneous | The supervisor will provide assistance for various procedures (B/A and tax-exemption treatment) for smooth implementation of the construction work. |

It is desirable to procure construction materials and equipment in pace with the progress of facility construction so that the materials and equipment will be available for the project at the stage when they are required. Therefore, a procurement plan and a transport plan which state the delivery dates, transport routes and transport methods of products to be procured in Japan will be prepared before commencement of the construction work. As ease of maintenance and the quality of after-sales service are important factors in the selection of equipment for procurement, a study to verify those issues will be conducted before commencement of the work.

(2) Procurement Supervision Plan

1) Time Required for Manufacturing Equipment

A maximum of four months will be required for manufacturing the equipment. Since the equipment has to be procured at the appropriate stage of project implementation, measures required for implementation of the procurement in strict conformity to the execution schedule shall be taken so that the equipment will be delivered to the project site after the facility construction has been completed.

2) Pre-shipment Inspection

An independent inspection organization will implement pre-shipment inspection of each piece of equipment procured in Japan when the equipment shipped from the manufacturer is received at the port of export. The inspection organization will examine the export documents including the packing list and compare the descriptions in the documents with the equipment to be shipped. The inspection organization will issue an inspection certificate and a report when it finds no discrepancy between the descriptions in the documents and the equipment. The pre-shipment inspection of products to be procured in Singapore and Thailand will be carried out in Singapore and Thailand, respectively.

3) Time Required for Transport

The Port of Yokohama is expected to be the port of loading for the goods to be procured in Japan because of the locations of the manufacturers' plants for those goods. The time required for sea transport of goods from Japan to Yangon is estimated at about three weeks. The time required for transport from Yangon to the project sites is estimated at (time required for customs clearance + one week). The time required for sea transport from Singapore and Yangon and for land transport from Thailand and Yangon is estimated at one week and three days, respectively.

4) Acceptance Inspection and Handover

A procurement agent (trading company) and the Myanmar side will conduct the acceptance inspection after the equipment has been delivered to the project sites. They will inspect all types of procured equipment for quantities, appearance, operation, accessories and spare parts. One month is considered to be the period required for the entire process of acceptance inspection and handover of equipment (at the four project sites) because the equipment delivery to the project sites may take a few days due to the limited availability of means of land transport and it will take a few days to verify the quantities of numerous spare parts.

2-2-4-5 Quality Control Plan

In principle, the standards provided by the Japanese Architectural Standard Specifications (JASS 5), the Architectural Institute of Japan, Japanese Industrial Standards (JIS) and the Guidelines for Construction Work Execution Supervision will be used as the standards for the facility construction in this Project. With the aim of satisfying the required basic qualities by type of work provided in these standard specifications and design documents, 1) an execution management system will be established, 2) an execution plan describing the methods of quality control, work progress control and photographic control will be prepared for each type of work to prevent unevenness of quality, 3) all

personnel involved in the execution of the construction work including local contractors will be made familiar with the contents of the execution schedule in the work schedule meetings, and 4) the design documents will be examined thoroughly at an early stage as a measure for quick solution of problems. The table 2-10 shows the types of work, work items and test methods which require special attention.

Table 2-10 Types of work, subjects and test methods which require special attention for quality control

| Type of work | Subject | Test method |
|-------------------------------------|--|--|
| Excavation, replacement with gravel | Bearing ground, rolling compaction | Visual inspection, plate bearing test |
| Structural concrete | Slump, water/cement ratio, compressive strength | Slump test, compression test |
| Reinforcement bars | Strength, bar arrangement, anchorage length and lap joints | Tension test, visual inspection, measurement |
| Progress in the skeleton work | Vertical and horizontal accuracy | Frame examination, visual inspection, measurement |
| Waterproofing | Roofing and around RD | Confirmation of reinforcement, waterproofing test. |

2-2-4-6 Procurement Plan

The procurement plan considers local procurement as the preferred method for the procurement of construction materials and equipment in this Project, as mentioned above, and also includes procurement of some of the materials and equipment in Japan. The criteria for selection of materials and equipment are not only quality and weather ability, but also ease/difficulty of procurement, repair and after-sales service system (including provision of parts and consumables) and their use in Myanmar. These criteria will be analyzed comprehensively in the selection of the materials and equipment.

A study of the transport route, transport methods and various conditions for transport will be implemented after the preparation of a transport plan in accordance with the work execution plan and with appropriate knowledge of time of delivery, quantities, capacities, weights, etc. of the products to be procured.

2-2-4-7 Soft Component (Technical Assistance) Plan

Soft Component of the Project will not be considered.

2-2-4-8 Implementation Schedule

When it has been decided that this Project will be implemented under the Grant Aid Cooperation Scheme of Japan, the execution design and construction work (including procurement of equipment) will be implemented after the conclusion of the Exchange of Notes (E/N) and Grant Agreement (G/A) between the Governments of Japan and Myanmar.

The table 2-11 shows the Work Execution Schedule of this Project.

Table 2-11 Work execution schedule

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|--------------------------|--|-------------------|---|-----------------------------|-----------------|---|---|---|---|----|------------------------------|----|----|----|
| Execution design | ■ (Field study) | | | | | | | | | | | | | |
| | | ▭ (Work in Japan) | | | ■ (Field study) | | | | | | | | | |
| | | | | | ▭ (Field study) | | | | | | <u>A total of 6.5 months</u> | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Construction/procurement | ■ 【Facility design】 | | | | | | | | | | | | | |
| | ■ (Preparatory work) | | | | | | | | | | | | | |
| | ■ (Foundation work) | | | | | | | | | | | | | |
| | ■ (Equipment and finishing work) | | | | | | | | | | | | | |
| | ■ (Skeleton work) | | | | | | | | | | | | | |
| | ■ (Exterior work, inspection/adjustment) | | | | | | | | | | | | | |
| | ■ 【Procurement of equipment】 | | | | | | | | | | | | | |
| | ■ (Manufacturing procurement) | | | | | | | | | | | | | |
| | ■ (Transport) | | | | | | | | | | | | | |
| | ■ (Installation/adjustment) | | | | | | | | | | | | | |
| | | | | <u>A total of 14 months</u> | | | | | | | | | | |

2-3 Obligations of Recipient Country

It will be important for the Myanmar side to implement the work under its responsibility at appropriate stages of the project in relation to the progress of the work under the responsibility of the Japanese side. The table 2-12 summarizes the stages at which each work under the responsibility of the Myanmar side should be implemented.

Table 2-12 Summary of the stages of implementation and description of the work under the responsibility of the Myanmar side

| Stage of implementation | Description |
|---|--|
| Before the commencement of project implementation | B/A and payment of the associated commission Notification of A/P and payment of the associated commission Reservation of sites for the construction work and temporary yards Removal of obstacles to the construction work from the construction areas (removal of trees and roots and facilities and equipment which may become obstacles to the construction work) Application for the permits and approvals required for the construction work and payment of the costs associated with the application Provision of assistance to project personnel for their entry into, stay in and exit from Myanmar |
| During project implementation | Reservation of safe passageways for students, workers and visitors to the university Provision of assistance for the import process and customs clearance of procured materials and equipment Tax-exemption Coordination with relevant organizations Work for the extension of and connection with public infrastructures and payment of the costs of the work |
| After the completion of project implementation | Installation of the existing equipment and procurement of furniture, appliances and equipment not included in the contract Extension of telephone and LAN cables and payment of the cost of the extension Appropriate and effective use of the facilities and equipment and payment of their maintenance costs |

2-4 Project Operation Plan

A month-long introductory operation training will be provided to the teaching and research staff after the handover of each piece of equipment.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Costs borne by the Myanmar side (refer to Table 2-13)

Table 2-13 Costs borne by the Myanmar side

| Item of Myanmar's Responsibility | Amount of Share (1000 Ks) | Yen equivalent (1000 yen) | Remarks |
|---|---------------------------|---------------------------|---------|
| Before the commencement of the construction work Removal and relocation of obstacles (trees and existing structures) and ground leveling in construction work area | 1,543 | 150 | |
| During the construction period Lead-in wiring to the distribution box | 3,087 | 300 | |
| After the completion of the construction work Equipment and cable, planting and furniture and fixtures out of the scope of works by the Japanese side | 7,203 | 700 | |
| Other expenditures Commissions for banking arrangement (B/A) and authorization to pay (A/P) | 10,290 | 1,000 | |
| Total | 22,123 | 2,150 | |

(2) Estimation Conditions

- a. Time of estimation : August, 2012
- b. Foreign exchange rates : US\$ 1 = 81.06 yen
: 1 MMK = 0.09718 yen
- c. Construction/procurement period:
Period of detailed design, construction work and procurement of equipment as shown in the execution schedule
- d. Miscellaneous:
The estimation shall be carried out in accordance with the rules of the Grant Aid Cooperation Scheme of the Government of Japan.

2-5-2 Operation and Maintenance Costs

After the handover of the facilities and equipment after the completion of the Project, the university will bear the cost required for the maintenance of the newly constructed facilities in addition to the maintenance cost of the existing facilities. The amount of the required additional cost is estimated in the following. The estimation mentioned below does not include costs for repainting, replacement of equipment and purchase of spare parts required due to time-related deterioration.

The conditions used in the estimation of the required cost:

- i. The university shall be open for eight hours a day from 8 a.m. to 4 p.m.
- ii. There shall be two 45-day recesses a year, from mid-September and from the beginning of April.

- iii. A six-month period from the beginning of May to the end of October shall be considered as the rainy season.
- iv. Refrigerators, freezers, incubators and constant temperature chambers shall be operated 24 hours a day.

The operating ratios of the facility loads deduced from the above-mentioned conditions and the environmental conditions were taken into consideration in the estimation of the required cost.

The cost required for the operation of the facilities was estimated at 12,078,000 Ks/year (1,171,566 yen/year) \pm 10 %, as shown in the table 2-14

Table 2-14 Cost required for facility operation

| | Jan. | Feb. | Mar. | Apr. | May | Jun. |
|---|--------|--------|--------|--------|--------|--------|
| Total number of days | 31 | 28 | 31 | 30 | 31 | 30 |
| Number of working days | 22 | 20 | 22 | 0 | 12 | 21 |
| Electric power consumption per year (8 hours/day, kVAH) | 3,399 | 4,546 | 7,816 | 0 | 2,171 | 3,798 |
| Electric power consumption per year (24 hours, kVAH) | 13,392 | 12,096 | 13,392 | 12,960 | 13,392 | 12,960 |
| Electricity cost (thousand Ks) | 1,259 | 907 | 1,004 | 972 | 1,004 | 972 |

| Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Total |
|--------|--------|--------|--------|--------|--------|---------|
| 31 | 31 | 30 | 31 | 30 | 31 | 365 |
| 22 | 23 | 12 | 0 | 22 | 21 | 197 |
| 5,387 | 5,632 | 2,939 | 0 | 5,000 | 3,244 | 43,932 |
| 13,392 | 13,392 | 12,960 | 12,960 | 12,960 | 13,392 | 157,680 |
| 1,004 | 1,004 | 972 | 1,004 | 972 | 1,004 | 12,078 |

Chapter 3. Project Evaluation

Chapter 3. Project Evaluation

3-1 Preconditions

There are following preconditions for the implementation of the Project;

- 1) Application for the permits and approvals required for the construction work and payment of the costs associated with the application by YAU
- 2) Customs arrangement (YAU carries out for DAR, CARTC, and VFRDC)
- 3) Tax exemption (YAU carries out for DAR, CARTC, and VFRDC)
- 4) Reservation of sites for the construction work and temporary yards (YAU)
- 5) Removal of obstacles to the construction work from the construction areas (YAU)
- 6) Reservation of safe passageways for students, workers and visitors to the university
- 7) Groundwork such as extension of electricity and water to the construction site (YAU)
- 8) Extension of telephone and LAN cables (YAU)
- 9) Procurement of furniture, appliances and equipment not included in the contract (YAU)
- 10) Payment of the associated commission to Japanese foreign exchange bank based on B/A (YAU to MOAI)
- 11) Provision of assistance to project personnel for their entry into, stay in and exit from Myanmar (YAU)
- 12) Appropriate and effective use of the facilities and equipment and payment of their maintenance costs (YAU, DAR, CARTC, VFRDC)
- 13) Costs for construction of buildings, installation of equipment not included in the Grant Aid (YAU, DAR, CARTC, VFRDC)

3-2 Necessary Inputs by Recipient Country

There are following necessary inputs by Myanmar in order to generate and maintain the effect.

- 1) Increase of teaching staff at Department of Animal Science and Department of Agricultural Engineering at YAU (YAU)
- 2) Review of existing curriculum of Department of Animal Science and Department of Agricultural Engineering (YAU)
- 3) Development of curriculum and syllabus of relevant 9 Departments in order to maximize the effective use of research and practical building which will be newly constructed (YAU)
- 4) Planning of operation of common laboratories (YAU)
- 5) Experiment and sharing of technologies and information among departments in addition to sharing of common laboratories (YAU)
- 6) Reservation of experimental agricultural field for Department of Agricultural Engineering (YAU)
- 7) Enhancement of lecture (including experimental work) for the final year students (YAU)
- 8) Verification and reservation of personnel for maintenance of equipment and distributors that have capacity of maintenance, management and repair (YAU, DAR, CARTC, VFRDC)
- 9) Planning and implementation of research and trainings using the renewed equipment (YAU, DAR, CARTC, VFRDC)
- 10) Technology and information sharing among institutions (between YAU and DAR, CARTC, and VFRDC or among all four)

3-3 Important Assumptions

Important external conditions are assumed for generation of long-lasting effect:

- 1) Long-term agriculture planning (Especially promotion of agricultural mechanization → construction of model mechanization farm, entry of private sector and application of improved technology in distribution of agricultural machinery and agricultural inputs → cultivation and dissemination of latest production measures including effective cropping mechanism, appropriate use of production materials, appropriate agricultural extension method, and development of high-yield cultivar)
- 2) Implementation of technical assistance projects by other countries including Japan and donors

3-4 Project Evaluation

3-4-1 Relevance

In the economy of Myanmar, agricultural dependence is very high as is made clear from the fact that the agricultural population comprises over 60% of the total population and the agricultural sector accounts for about 30% of GDP, and the new Government that took office in March 2011 regards agriculture and its associated industries as the most important sector for economic development. The present Government is planning to develop human resources for agricultural development through training centers and higher education institutions, and is promoting measures to build up these agricultural human resource development organizations. This Project is to provide assistance to Yezin Agricultural University (YAU) which is the only agricultural college in Myanmar that serves as a higher education institution for fostering officials of MOAI and to the Central Agricultural Research and Training Center (CARTC) and Vegetables and Fruits Research and Development Center (VFRDC) that carries out research as well as provide training courses. The content of the assistance is in line with Myanmar's long-term development plan. In addition, the Project beneficiaries include a wide range from farmers, agricultural engineers (government agricultural technicians, agricultural extension workers, researchers, teaching staff of educational institutions such as agricultural high schools, to private agricultural engineers) and agricultural students. Therefore, the benefit is expected to be provided to a wide range of people.

Taking a great number of beneficiaries, development of human resources, and high coherency with long-term development plan of Myanmar into account, the relevance of the Project is considered quite high.

3-4-2 Effectiveness

Following effects are expected to be generated by this Project:

- 4) With the implementation of this Project, it is highly expected that proportion of hours spent on experimental practice at YAU will increase (38 hours for experimental work (9.2%) out of 411 hours in total). As a result of this, final year students are also provided the opportunity to conduct experimental practice. Among agricultural practice which is currently allocated 110 hours, 10% at least is expected to be transferred to the experimental work at laboratories. Consequently, the total hours for experimental practice are expected to increase to 12%.
- 5) In relation to the above, as the number of curriculum for the final year is expected to increase by 11 subjects (1 subject from 11 majors) at least, the number of curriculum which is currently 76 courses is estimated to be 87 courses.

- 6) Seven departments of YAU except Department of Animal Science and Department of Agricultural Engineering have published 127 research papers (42 papers per year) in the last three years from 2009 till 2012. This shows that more than 6 papers are annually published at each department. With the implementation of the Project, more research will be conducted, which is expected to increase the published paper. In addition, publication from Department of Animal Science and Department of Agricultural Engineering can be expected. Assuming that the number of published paper increases by two in each department in 3 years (9 departments x 2), 18 papers more are expected to be published, in other words, the total number of published papers will be 60 papers per year from the current 42 papers per year.
- 4) In 2011, YAU has trained 204 agricultural engineers in total (35 from Department of Agronomy, 20 from Agricultural Chemistry, 39 from Botany, 30 from Department of Entomology, and 80 from Department of Agricultural Economics). If this Project is implemented, training is expected to be provided to around 40 persons from each department (40 persons x 8 departments) and 100 persons from Department of Agricultural Economics, which in total is 420 persons trained.
- 5) As academic activities become active, the number of students and teaching staff is estimated to increase. The current total number of students and teaching staff is 9,891. Assuming the increase by 10%, it will be 10,880 persons in total.
- 6) DAR has published 39 papers (13 papers per year) in the past three years (Seed Bank, five departments of Horticulture, Soil Science, Biological Engineering, Entomology, and Plant Pathology). This Project is expected to promote research activities, which is estimated to result in the publication of 20 papers per year (60 papers for 3 years) with 4 papers per department.
- 7) DAR has trained 3,735 persons in the past three years (245 per year on average). The breakdown is 72 local staff of DAR (24 per year), 20 farmers (6 per year), 424 YAU students (141 per year), and 219 agricultural engineers (73 per year). With the estimated increase in the number of trainings to be provided by 20%, 29 DAR staff, 8 farmers, 170 students, and 88 agricultural engineers are estimated to take part in the training.
- 8) CARTC has trained 2,357 persons (785 per year) in the past three years. Although the breakdown of participants is not available, trainings mainly focused on agricultural basic technique such as general education, organic farming, seed technology, and agri-business are provided. With the expected increase of trainings by 20%, 942 persons are expected to be trained annually.
- 9) VFRDC has trained 2,344 persons (781 per year) in the past three years (1,357 agricultural engineers (452 per year), 430 farmers (143 per year), 417 students (139 per year), and 140 staff working at donors (46 per year)) with 734 persons on average (excluding donor staff). Similarly, the implementation of this Project is expected to increase the number of provided trainings by 20%, which results in annually training 881 persons in total (542 agricultural engineers. 172 farmers, 167 students) (excluding those working at donor organizations).

Taking a great number of beneficiaries, development of human resources, and high coherency with long-term development plan of Myanmar into account, the relevance of the Project is considered quite high.

1) Quantitative output

The expected quantitative output is presented as table 3-01:

Table 3-01 Quantitative output of this Project

| Indicators | | Baseline (2011) | Benchmark (2017) 3 years after the Project |
|--------------|---|-----------------|--|
| YAU | | | |
| 1. | Proportion of experimental hours out of total lesson hours in 9 departments | 9% | 12% |
| 2. | Number of curriculums | 76 | 87 |
| 3. | Number of research papers | 42 | 60 |
| 4. | Number of trainees | 204 | 420 |
| 5. | Number of students and teaching staff | 9,891 | 10,880 |
| DAR | | | |
| 6. | Number of research papers | 13 | 20 |
| 7. | Number of trained staff | 24 | 29 |
| 8. | Number of trained farmers | 6 | 8 |
| 9. | Number of trained students | 141 | 170 |
| 10. | Number of trained agricultural engineers | 73 | 88 |
| CARTC | | | |
| 11. | Number of total training participants | 785 | 942 |
| VFRDC | | | |
| 12. | Number of trained agricultural engineers | 452 | 542 |
| 13. | Number of trained farmers | 143 | 172 |
| 14. | Number of trained students | 139 | 167 |

2) Qualitative output

The following qualitative output is expected to be generated with the implementation of this Project:

- 1) Educational/training curriculum and content of test research will satisfy needs of farmers.
- 2) Outputs as a research result of university and each research institute will meet consumers' needs.
- 3) Techniques, knowledge, and motivation of agricultural human resources will improve.

Therefore, it can be concluded that the relevance as well as the effectiveness of this Project are expected to be high.

Appendices:

Appendices:

| | |
|---|------|
| 1. Member List of the Study Team | A-1 |
| 2. Study Schedule | A-3 |
| 3. List of Parties Concerned in the Recipient Country | A-9 |
| 4. Minutes of Discussions..... | A-13 |
| 5. Boring Survey Result..... | A-53 |
| 6. Equipment Selection..... | A-61 |
| 7. Equipment Plan..... | A-91 |

1. Member List of the Study Team

Appendix 1. Member List of the Study Team

The First and Second Study

| Role of the Team | Name and Title |
|--|--|
| Team Leader | Jun YAMAZAKI Deputy Director, Paddy Field Based Farming Area Division 1, Rural Development, JICA |
| Chief Consultant / Human Resource Development in Agriculture | Masami SUDA System Science Consultants Inc. |
| Educational Equipment Planning | Kenji OKADA System Science Consultants Inc. |
| Facility Planning / Operation and Maintenance | Kazuaki TANI System Science Consultants Inc. (Architecture) |
| Agricultural Equipment Planning / Cost Estimation | Kotaro MATSUNAWA Japan Development Service Co., Ltd. (JDS) |
| Execution and Procurement Planning / Cost Estimation | Yoshiya NAKANISHI System Science Consultants Inc. (Architecture) |

The Third Study (DF Explanation Survey)

| Role of the Team | Name and Title |
|--|--|
| Team Leader | Kenji KANEKO Deputy Director, Paddy Field Based Farming Area Division 1, Rural Development, JICA |
| Chief Consultant / Human Resource Development in Agriculture | Masami SUDA System Science Consultants Inc. |
| Facility Planning / Operation and Maintenance | Kazuaki TANI System Science Consultants Inc. (Architecture) |

2. Study Schedule

Appendix 2. Study Schedule

The first survey

| Role of the Team | | Team Leader | Chief Consultant/ Human resource development in Agriculture | Educational Equipment Planning | Facility Planning Operation and Maintenance | Agricultural Equipment Planning / Cost Estimation | Execution and Procurement Planning / Cost Estimation |
|------------------|-----|---|--|---|--|--|---|
| Name | | Jun YAMAZAKI | Masami SUDA | Kenji OKADA | Kadzuaki TANI | Kotaro MATSUNAWA | Yoshiya NAKANISHI |
| Date | | | | | | | |
| July 8, 2012 | Sun | Narita - Bangkok - Yangon | | | Narita - Bangkok - Yangon | | |
| July 9, 2012 | Mon | JICA Myanmar Office, KOICA, Yangon - Ney Pyi Taw (NPT) | | | Visit to Surveying company | | |
| July 10, 2012 | Tue | MOAI, YAU (explanation of Inception report) | | | YAU (Existing building and equipment survey) | | |
| July 11, 2012 | Wed | MOAI, Seed bank, YAU (Explanation of Inception report) | | | YAU (Existing building and equipment survey) | | |
| July 12, 2012 | Thu | MOAI, Seed bank, YAU (Explanation of Inception report) | | | YAU (Existing building and equipment survey) | | |
| July 13, 2012 | Fri | YAU (Discussion of Minutes) | | | YAU (Existing building and equipment survey) | | |
| July 14, 2012 | Sat | Team meeting | | Narita - Bangkok - YGN | Team meeting | | |
| July 15, 2012 | Sun | Documentation arrangement | | YGN - NPT | Documentation arrangement | | |
| July 16, 2012 | Mon | MOAI, YAU (Discussion of Minutes) | | YAU (Existing facilities, equipment survey) | | | |
| July 17, 2012 | Tue | NPT - YGN | YAU, DAR (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) | YAU (Existing equipment and confirmation of request) | | |
| July 18, 2012 | Wed | Narita | YAU, DAR (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) | YAU (Existing equipment and confirmation of request survey) | | |
| July 19, 2012 | Thu | | Team meeting and documentation arrangement | | | | |
| July 20, 2012 | Fri | | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) | YAU (Existing equipment and confirmation of request survey) | | |

| Role of the Team | | Team Leader | Chief Consultant/ Human resource development in Agriculture | Educational Equipment Planning | Facility Planning Operation and Maintenance | Agricultural Equipment Planning / Cost Estimation | Execution and Procurement Planning / Cost Estimation |
|------------------|-----|--------------|--|--|---|--|---|
| Name | | Jun YAMAZAKI | Masami SUDA | Kenji OKADA | Kadzuaki TANI | Kotaro MATSUNAWA | Yoshiya NAKANISHI |
| Date | | | | | | | |
| July 21, 2012 | Sat | | Team meeting and documentation arrangement | | | | |
| July 22, 2012 | Sun | | Team meeting and documentation arrangement | | | | |
| July 23, 2012 | Mon | | YAU (Existing equipment, existing facilities and confirmation of request survey) | | | | Narita - Bangkok - YGN |
| July 24, 2012 | Tue | | YAU (Existing equipment, existing facilities and confirmation of request) | | | | YGN - NPT YAU (Existing facilities survey) |
| July 25, 2012 | Wed | | NPT - YGN | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) | NPT - YGN | YAU (Existing Facilities survey) |
| July 26, 2012 | Thu | | VFRDC, CARTC (Explanation of Inception report) | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) | VFRDC (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) |
| July 27, 2012 | Fri | | VFRDC (Operation and research contents survey) | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) | VFRDC (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) |
| July 28, 2012 | Sat | | Documentation arrangement | | | | |
| July 29, 2012 | Sun | | Documentation arrangement | | NPT - YGN - Bangkok | Documentation arrangement | |
| July 30, 2012 | Mon | | CARTC (Operation and research contents survey) | YAU (Existing equipment and confirmation of request survey) | Bangkok (VISA application) | CARTC (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) |
| July 31, 2012 | Tue | | CARTC (Operation and research contents survey) | YAU (Existing equipment and confirmation of request survey) | Bangkok (VISA receipt) | CARTC (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey) |
| August 1, 2012 | Wed | | VFRDC (Operation and research contents survey) | YAU (Existing equipment and confirmation of request survey) | Bangkok - YGN | YGN (Local agents survey) | YAU (Existing Facilities survey) |
| August 2, 2012 | Thu | | Documentation arrangement | | YGN - NPT | Documentation arrangement | |
| August 3, 2012 | Fri | | YGN (JICA office) | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey and facilities planning) | YGN - BKK - | YAU (Existing Facilities survey and facilities planning) |
| August 4, 2012 | Sat | | YGN - Bangkok - | NPR - YGN | Documentation arrangement | Narita | Documentation arrangement |

| Role of the Team | | Team Leader | Chief Consultant/ Human resource development in Agriculture | Educational Equipment Planning | Facility Planning Operation and Maintenance | Agricultural Equipment Planning / Cost Estimation | Execution and Procurement Planning / Cost Estimation |
|------------------|-----|--------------|--|--|---|--|---|
| Name | | Jun YAMAZAKI | Masami SUDA | Kenji OKADA | Kadzuaki TANI | Kotaro MATSUNAWA | Yoshiya NAKANISHI |
| Date | | | | | | | |
| August 5, 2012 | Sun | | Narita | Documentation arrangement | | | Documentation arrangement |
| August 6, 2012 | Mon | | | YGN (Local Procurement survey) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 7, 2012 | Tue | | | YGN (Local Procurement survey) YGN - Bangkok | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 8, 2012 | Wed | | | Bangkok (VISA application) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 9, 2012 | Thu | | | Bangkok (VISA receipt) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 10, 2012 | Fri | | | Bangkok - YGN | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 11, 2012 | Sat | | | YGN - NPT | Documentation arrangement | | Documentation arrangement |
| August 12, 2012 | Sun | | | Documentation arrangement | | | Documentation arrangement |
| August 13, 2012 | Mon | | | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 14, 2012 | Tue | | | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 15, 2012 | Wed | | | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 16, 2012 | Thu | | | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 17, 2012 | Fri | | | YAU (Existing equipment and confirmation of request survey) | YAU (Existing Facilities survey and facilities planning) | | YAU (Existing Facilities survey and facilities planning) |
| August 18, 2012 | Sat | | | NPT - YGN - Bangkok - | | | NPT - YGN - Bangkok - |
| August 19, 2012 | Sun | | | Narita | | | Narita |

The Second Survey

| Role of the Team | | Chief Consultant / Human Resource Development in Agriculture |
|--------------------|-----|--|
| August 27, 2012 | Mon | Narita - Bangkok - YGN |
| August 28, 2012 | Tue | JICA office YGN - NPT |
| August 29, 2012 | Wed | YAU (Curriculum, Number of Staff Contents of Study Survey) |
| August 30, 2012 | Thu | YAU (Farm Machinery Discussion with Reactor) |
| August 31, 2012 | Fri | YAU (Facility and Equipment discussion) |
| September 1, 2012 | Sat | Documentation Arrangement |
| September 2, 2012 | Sun | Documentation Arrangement |
| September 3, 2012 | Mon | YAU (Budget, Purpose of the Farm Machinery) |
| September 4, 2012 | Tue | YAU (Paddy field of YAU survey) |
| September 5, 2012 | Wed | YAU (Farm Machinery Discussion with Reactor) |
| September 6, 2012 | Thu | DAR (Contents of Research and Condition of the Office) |
| September 7, 2012 | Fri | DAR (Contents of Research and Condition of the Office) |
| September 8, 2012 | Sat | Documentation Arrangement |
| September 9, 2012 | Sun | Documentation Arrangement |
| September 10, 2012 | Mon | YAU (Farm Machinery Priority List Discussion with Reactor) |
| September 11, 2012 | Tue | NPT - YGN |
| September 12, 2012 | Wed | CARTC, VFRDC (Equipment Discussion) |
| September 13, 2012 | Thu | JICA Office (Survey result report) |
| September 14, 2012 | Fri | JICA Office, YGN - Bangkok - |
| September 15, 2012 | Sat | Narita |

The Third Survey

| Role of the Team Name | | Team Leader Kenji KANEKO | Chief Consultant Masami SUDA | Facility Planning Kazuaki TANI |
|-----------------------|-----|--|--|--|
| December 12, 2012 | Wed | | Narita - Bangkok - YGN | |
| December 13, 2012 | Thu | | JICA Office, Embassy of Japan | |
| December 14, 2012 | Fri | | MOAI Department of Agriculture, DAR, YAU, (Final confirmation of Equipment Arrangement and Facilities) | |
| December 15, 2012 | Sat | | Documentation arrangement | |
| December 16, 2012 | Sun | | NPT YGN | Documentation arrangement |
| December 17, 2012 | Mon | | CARTC (Final confirmation of Equipment) | YAU (Final confirmation of Equipment Arrangement and Facilities) |
| December 18, 2012 | Tue | Narita - Bangkok - YGN | VFRDC (Final confirmation of Equipment) | YAU (Final confirmation of Equipment Arrangement and Facilities) |
| December 19, 2012 | Wed | CARTC, VFRDC (Confirmation of Final Equipment List) - NPT (Confirmation of YAU Equipment List) | | YAU (Final confirmation of Equipment Arrangement and Facilities) |
| December 20, 2012 | Thu | MOAI, Department of Agricultural Planning (Minute discussion), YAU, DAR (Equipment confirmation) NPT - YGN | MOAI, Department of Agricultural Planning (Minute discussion), YAU, DAR (Equipment confirmation) | YAU (Final confirmation of Equipment Arrangement and Facilities) |
| December 21, 2012 | Fri | JICA Office, Embassy of Japan, YGN - Bangkok - | YAU, DAR (Equipment confirmation) | YAU (Final confirmation of Equipment Arrangement and Facilities) |
| December 22, 2012 | Sat | Narita | Documentation arrangement | |
| December 23, 2012 | Sun | | NPT - YGN | Documentation arrangement |
| December 24, 2012 | Mon | | JICA Office | YAU (Final Confirmation of Facilities) |
| December 25, 2012 | Tue | | Narita | YAU (Final Confirmation of Facilities) |
| December 26, 2012 | Wed | | | Npt - CARTC (Equipment confirmation) YGN - Bangkok - |
| December 27, 2012 | Thu | | | Narita |

3. List of Parties Concerned in the Recipient Country

Appendix 3. List of Parties Concerned in the Recipient Country)

1. Yezin Agricultural University : YAU

| Name | Title |
|----------------------------|--|
| Dr. Tin Htut | Rector |
| Prof.Dr.Myo Kywe | Pro-Rector (Academic) |
| Dr. Nang Hseng Hom | Associate Professor, Department of Agricultural Botany |
| Ms. Cho Cho Oo | Lecturer, Department of Agricultural Botany |
| Ms. Thuzar Nare | Assistant Lecturer, Department of Agricultural Botany |
| Ms. Hlaing Htay | Assistant Lecturer, Department of Agricultural Botany |
| Dr. Soe Soe Thein | Professor, Department of Agricultural Chemistry |
| Ms. Daw Nang Ohn Myint | Lecturer, Department of Agricultural Chemistry |
| Dr. Aung Kyaw Myint | Assistant Lecturer, Department of Agricultural Chemistry |
| Dr. Dolly Kyaw | Professor and Head of Department, Department of Agricultural Economics |
| Dr. Nay Myo Aung, Ph. D | Assistant Lecturer, Department of Agricultural Economics |
| Dr. Hnin Yu Lwin | Department of Agricultural Economics |
| Mr. Arkar Minn | Senior Lecturer, Department of Agricultural Engineering |
| Ms. Htay Htay Oo | Department of Agricultural Engineering |
| Mrs. Aye Thida Kyaw | Department of Agricultural Engineering |
| Ms. Khin Zar Zar Tun | Department of Agricultural Engineering |
| Mr. Hla Moe Oo | Tractor Driver, Department of Agricultural Engineering |
| Dr. Mar Mar Kyu | Professor and Head of Department, Department of Agronomy |
| Dr. Than Da Min, Ph. D | Associate Professor, Department of Agronomy |
| Dr. Tin Wan | Head of Administration Department and Animal Science Department |
| Mr.Aye Soe | Instructor, Department of Animal Science |
| Ms. Daw Aye Aye Maw | Demonstrator, Department of Animal Science |
| Dr. Ei Ei Win Maung | Demonstrator, Department of Animal Science |
| Dr. Thi Tar Oo | Professor and Head of Department, Department of Entomology and Zoology |
| Dr.Ah Nge Htwe, Ph.D | Assistant Lecturer, Department of Entomology and Zoology |
| Dr. Nyo Nyu | Professor, Department of Horticulture |
| Dr. Khin Thida Myint, Ph.D | Associate Professor, Department of Horticulture |
| Mr. San Shwe Myint | Assistant Lecturer, Department of Horticulture |
| Dr. Maung Maung Myint | Professor and Head of Department, Department of Plant Pathology |
| Dr. Chit Chit Win | Lecturer and Head of Department, Myanmar Department |
| Ms. Tin Hnin Caff Htay | Head of Department, Mathematics Department |
| Ms. Thin Thin Hlaing | Head of Department, English department |
| Ms. Khaing Wai Nyunt | Head of Department, Physics Department |
| Ms. Winn Lei Lei Than | University Librarian |
| Mr. Tin Ko Ko | Registrar Grade I |

2. Department of Agricultural Research, Ministry of Agriculture and Irrigation : MOAI

| Name | Title |
|----------------------|--|
| Dr. Aung Kyi | Deputy Director General |
| Ms. Khin San Wai | Director, Biotech, PGR and PP Division |
| Mr Maung Maung Thein | Director, Industrial Crops and Horticulture Division |
| Ms. Myint Tin Tin | Director, Rice Division |
| Ms. Than Than Soe | Director, Agronomy, Agricultural Economics and Statistics Division |
| Mr. Myint Aung | Director, |
| Ms. Yi Yi Myint | Head of Seed Bank |
| Dr. Khin Mar Hday | Head of Water Utilization Research Section |
| Dr. NewNew Yin | Head of Entomology Section |
| Ms. Myint Myint Sann | Research officer, Pathology Section |
| Ms. Ten Yi | Head of Biotechnology Section |
| Dr. Su Su Win | Head of Soil Science Section |
| Dr. Maung Maung Tar | Research officer, Industry Crop Section |
| Dr. Ohm Mar Saw | Seed Bank |

3. VFRDC

| Name | Title |
|---------------------|---|
| Mr. Thet Zin Maung | Assistant Director, Vegetable and Plant Protection Laboratory |
| Mrs. Tin Tin Cho | Assistant Director, Vegetable and Plant Protection Laboratory |
| Mrs. Khin Khin Tun | Senior Officer, Fruit Science Laboratory |
| Mr. Kyaw Soe Win | Senior Officer, Plant Protection Laboratory |
| Ms. May Thin Khaing | Senior Staff Officer, Plant Tissue Culture Laboratory |
| Mr. Than Htike | Senior Officer, Plant Tissue Culture Laboratory |
| Ms. Khin Lay Naing | Officer, Plant Tissue Culture Laboratory |
| Ms. Aye Aye Nwe | Senior Officer, Soil and Nutrition Laboratory |
| Mr. Than Aye | Officer, Vegetable and Fruit Production |
| Ms. Ei Ei Htwe | Senior Officer, Vegetable Science Laboratory |
| Ms. Theingi Swe | Senior Officer, Vegetable Science Laboratory |
| Mr. Phyo Wai Aung | Senior Officer, Nursery Management |

4. CARTC

| Name | Title |
|----------------------|---|
| Mr. Thura Soe | Principle |
| Mr. Thet Lwin | Deputy Principle |
| Mrs. Cho Mar Tin | Staff Officer |
| Mrs. Myint Myint San | Staff Officer, Head of Soil Science Laboratory |
| Ms. Aye Myat Thwe | Deputy Assistant Staff Officer, Soil Science Laboratory |
| Ms. Khin Khin Aye | Deputy Assistant Staff Officer, Training Management Section |
| Ms. Ni Ni Khaing | Staff Officer, Head of Plant Protection Laboratory |
| Ms. Kyu Kyu Thin | Deputy Assistant Staff Officer, Plant Protection Laboratory |
| Ms. Myint Myint Win | Staff Officer, Head of Plant Tissue Culture Laboratory |
| Mr. Kyaw Soe | Head of Audio Room |

| | |
|----------------------|---|
| Ms. Tar Yar Wai Lwin | Staff Officer, Computer Room |
| Ms. Khin Htwe | Head of Photo Room |
| Mr. Sai Than Htay | Deputy Staff Officer, Head of Printing Room |

5.. Ministry of Agriculture and Irrigation : MOAI

| Name | Title |
|-----------------|---|
| Mr. Hla Kyaw | Director General, Department of Agricultural Planning |
| Mr. Aung Hlaing | Director, International Relation and Trade, Department of Agricultural Planning |
| Mr. Kyaw Win | Director General, Department of Agriculture (DOA) |
| Mr. Thein Lin | Director, Seed Division, DOA |
| Mr. Tin Win | Deputy Director, Project Planning, Management and Evaluation Division, DOA |

6. KOICA

| Name | Title |
|------------------|--|
| Mr. Kim Jin Taek | Korea Overseas Volunteers' Coordinator |

7. Embassy of Japan

| Name | Title |
|--------------------|------------------------------|
| Mr. Hideaki Matsuo | Counselor (Economic and ODA) |
| Mr. Hideki Wada | Second Secretary |

8. Japan International Cooperation Agency, Myanmar Office

| Name | Title |
|----------------------|-----------------------|
| Mr. Masahiko Tanaka | Representative |
| Mr. Katsuyoshi Saito | Deputy Representative |
| Dr. Minoru Yoshida | Project Coordinator |
| Mr. Tun Myint Thein | Program Officer |

4. Minutes of Discussions

Appendix 4. The first Minutes of Discussions

Minutes of Discussions
on
the Preparatory Survey (for Outline Design)
on
the Project for Improvement of Equipment for Human Resource Development in Agriculture
in the Republic of the Union of Myanmar

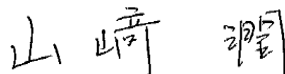
In response to a request from Yezin Agricultural University (hereinafter referred to as "YAU") under Ministry of Agriculture and Irrigation, the Republic of the Union of Myanmar, Japan decided to conduct a Preparatory Survey on the Project for Improvement of Equipment for Human Resource Development in Agriculture (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Myanmar the Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Mr. Jun Yamazaki, Deputy Director of Paddy Field Based Farming Area Division 1, Rural Development Department, JICA. It is scheduled to stay in the country from 8 July to 18 August, 2012.

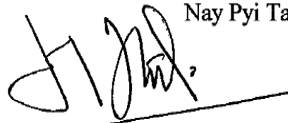
The Team held discussions with the officials concerned of the Government of Myanmar and conducted field survey.

In the courses of discussions and field survey, both sides have confirmed items described in the attached sheet.

Nay Pyi Taw, 16 July, 2012



Mr. Jun Yamazaki
Team Leader
Preparatory Survey Team
Japan International Cooperation Agency



Dr. Tin Htut
Rector
Yezin Agricultural University
Ministry of Agriculture and Irrigation
The Republic of the Union of Myanmar

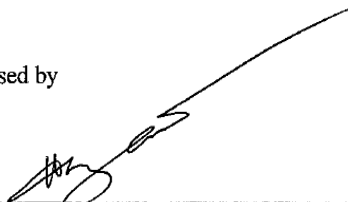


Dr. Thein Lwin
Director General
Department of Agricultural Research
Ministry of Agriculture and Irrigation
The Republic of the Union of Myanmar



U Kyaw Win
Director General
Department of Agriculture
Ministry of Agriculture and Irrigation
The Republic of the Union of Myanmar

Witnessed by



U Hla Kyaw
Director General
Department of Agricultural Planning
Ministry of Agriculture and Irrigation
The Republic of the Union of Myanmar

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the capacity of Human Development Institutions and to strengthen the training capacity of research institutions in Agriculture by constructing architecture building(s) at Yezin Agricultural University (YAU), and by supplying necessary equipment to YAU, the Department of Agricultural Research (DAR), the Vegetable and Fruit Research and Development Center (VFRDC), and the Central Agriculture Research and Training Center (CARTC) under Department of Agriculture (DOA).

2. Title of the Project

Both parties agreed that the Project title would be “the Project for Strengthening Human Development Institutions in Agriculture”. After consultation with the Government of Japan, the Project title shall be finalized.

3. Project site

3-1. The main campus of Yezin Agricultural University (YAU)

3-2. Department of Agricultural Research (DAR) at Yezin

3-3. Vegetable and Fruit Research and Development Center (VFRDC) under Department of Agriculture (DOA)

3-4. Central Agricultural Research and Training Center (CARTC) under DOA

4. Responsible and Implementing Agency

The both sides agreed in principle on the following management structure of the Project.

4-1. The Responsible Agency: Yezin Agricultural University (YAU), Ministry of Agriculture and Irrigation (MOAI)

4-2. The Implementing Agency: Yezin Agricultural University (YAU), Department of Agricultural Research (DAR), and Department of Agriculture (DOA), the Ministry of Agriculture and Irrigation

4-3. The Steering Committee

The Ministry of Agriculture and Irrigation will establish the Steering Committee. The tentative member of the Committee will be as follows.

(a) Deputy Minister, MOAI (Chair)

(b) Director General, Department of Agricultural Planning(DAP), MOAI

(c) Director General, DAR, MOAI

(d) Director General, DOA, MOAI

(e) Rector, YAU, MOAI (Secretary)

YAU will be responsible for administration of the Project regarding the measures to be taken by the Myanmar side as described in Annex-4, including: (a) ensuring all implementation agencies make necessary preparation of land, utility and facilities; (b) making necessary arrangement of tax exemption and custom clearance; (c) bearing necessary expense for administrative arrangement such as bank commission; and (d) conducting inspection on behalf of MOAI. It is, however, on each agency's responsibility to ensure the operation and maintenance cost after the Project. In case of any delay or difficulties in implementation stage, the Steering Committee will arrange timely decisions and necessary actions.

After official explanation from JICA Myanmar Office and consultation with the Union Minister for Agriculture and Irrigation, the Myanmar side shall finalize the management structure of the Project and inform to JICA Myanmar Office as soon as possible.

5. Requested Components

After discussions with the Team, the components described in Annex-1 were finally requested by

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the Myanmar side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

6. Japan's Grant Aid Scheme

6-1. The Myanmar side understood the Japan's Grant Aid Scheme explained by the Team, as described in Annex-3.

6-2. The Myanmar side will take the necessary measures, as described in Annex-4, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

7. Schedule of the Study

7-1. The consultants will proceed to further studies in Myanmar until 18 August, 2012, in addition, a supplemental study will be conducted if necessary.

7-2. JICA will prepare the draft final report in English and dispatch the draft report explanation mission to Myanmar order to explain its contents around December, 2012.

7-3. In case that the contents of the draft final report is accepted in principle by the Myanmar side, JICA will complete the final report and send it to the Myanmar by March, 2013.

8. Other relevant issues

8-1. Selection Criteria of Equipment at YAU

Both sides agreed on the following priority for selecting equipment and material to be procured in the Project.

Priority A: Equipment for education and experimentation necessary for undergraduate program

Priority B: Laboratory Equipment necessary for research activities by postgraduate students and teaching staff, excluding ones which require high maintenance cost and careful operation skills.

Requested general equipment and material will be examined carefully by the Team from the point of view of maintenance cost, operation skill, and the relevance to the objective of the Project. It is noted that the Myanmar side strongly requested buses for transporting students for field trip based on the extension curriculum of undergraduate program.

8-3. Selection Criteria for Equipment at DAR, VFRDC, and CARTC

Both sides confirmed that the objective of the Project is to improve the educational and training function of Agricultural institutions. Since the items requested by DAR, VFRDC, and CARTC include equipment for various purposes, the Team will examine the requested and existing equipment and will conclude the suitable items in consideration of the following criteria.

- (a) Applicability to the educational and training activities to students, extension worker etc.
- (b) Necessity of replacement (condition and needs)
- (c) Necessity to install additional equipment for the current needs in Agriculture sector

8-4. Activities with Other Organizations

YAU confirmed that the facilities and equipment supported by the Project shall be utilized for the education and research activities of YAU, and these shall not exclusively be used by other organizations including foreign donors and institutions.

8-5. Operation and Maintenance of Equipment and Facilities

The Myanmar side shall allocate necessary budget and human resources (teaching staff and technician etc.) for operation and maintenance of the equipment and facilities procured/constructed in the Project. The necessary operation and maintenance cost and number of staff will be calculated and reported by the Team. The Myanmar side will take necessary actions to secure the budget before and during implementation of the Project.

8-6. Equipment at Remote Campuses

The Myanmar side explained that remote campuses are intended to be used for field training of the final year students for exposing to farmers problems and it is not necessarily to install large scale laboratory equipment in the Project. The Myanmar side also explained that necessary equipment based on the curriculum is to be covered by the Myanmar side.

Annex-1: Components Requested by the Myanmar Side

Annex-2: Proposed Location of Facilities at YAU

Annex-3: Japan's Grant Aid Scheme

Annex-4: Major Undertakings by each Government

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