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# JOINT FINAL EVALUATION REPORT

# ON

# INSTITUTE OF POSTGRADUATE STUDIES IN AGRICULTURE

# PROJECT PHASE II

# IN BANGLADESH

A Project by the Government of Bangladesh
in Cooperation with
the Government of Japan

June 6, 1995

The Joint Final Evaluation Team
for the Institute of Post-graduate Studies
in Agriculture Project Phase II

# JOINT FINAL EVALUATION
# ON
# INSTITUTE OF POSTGRADUATE STUDIES IN AGRICULTURE
# PROJECT PHASE II
# IN BANGLADESH

Report of the Joint Evaluation Team
June 6, 1995

This report presents the independent findings and recommendations of the Evaluation Team. It does not necessarily represent the official views of the Government of Bangladesh or the Government of Japan.

Submitted to Relevant Agencies of:

the GOVERNMENT OF JAPAN, and
the GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

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## EXECUTIVE SUMMARY

The Institute of Post Graduate Studies in Agriculture (IPSA) was established in 1983 in order to strengthen post-graduate level of agricultural education and research in Bangladesh. The Japanese technical cooperation began in 1985 through Japan International Cooperation Agency (JICA), aiming to accelerate the project activities at IPSA, thus contributing to make IPSA a sustainable institution. In 1990 the Japanese technical cooperation was extended for another five years as Project Phase II. Throughout Project Phase I and II, dispatch of experts, provision of machinery and equipment, and training of Bangladeshi personnel in Japan were undertaken as the major inputs from Japan under the technical cooperation scheme. The technical cooperation of JICA ends on 3 July 1995 as scheduled.

The Joint Final Evaluation was conducted by a team consisting of five JICA and four Bangladeshi members. The objective of the evaluation was to assess the overall performance and impact of the project with emphasis on Project Phase II, and recommend measures to be taken by both the Japanese and Bangladesh governments for sustainable development of IPSA. The evaluation was conducted through interviewing individuals and agencies concerned, reviewing related documents, and discussing issues with relevant persons and agencies.

As a part of the technical cooperation scheme, highly qualified Japanese experts were dispatched to IPSA, and contributed to survey, planning and implementation of practical research in the research program as well as in the academic program. A total of eighteen faculty and staff members have been trained in Japan in the Phase II. The results of the training have been successfully applied to the IPSA's project activities. In addition, sophisticated machinery and equipment in IPSA were introduced through the JICA's cooperation.

The Team evaluated the project activities and accomplishments in the field of research, academic and outreach. IPSA's research program is conducted in basic/problem oriented research and also established a foundation for research-based high quality post graduate education program in the IPSA project. Research activities have been successful largely as a result of smooth technology transfer from Japan to the IPSA staff. But due to inadequate number of academic staff, research activities could not be undertaken as expected. The vacant positions in IPSA would be filled up shortly.

In the academic programme most significant achievement is the introduction of new course based curriculum from August 1991. After that academic programme has been implemented quite smoothly compared with former curriculum. Up to now 60 students have completed their MS Degree courses and 177 students are continuing MS programme. Besides 14 students are working on Ph.D programme.

Since IPSA is a post graduate institute IPSA's main outreach programs covered publication of research papers, organizing of seminars and workshops to dessiminate the reserach findings. The team appreciated this aspect of IPSA's outreach activities, but IPSA needs some more efforts in this field.

The IPSA Act was approved by the Parliament of Bangladesh on 15 January 1994, and it became effective from that date. The promulgation of the Act is a milestone for IPSA giving it a full autonomous status and degree conferring authority and allowing it to initiate necessary measures for its sustainability. Following the enforcement of the Act, a Rector has been appointed, Board of Regents has been constituted, Academic Council has been formed and efforts have been made to appoint a Registrar and a Treasurer for IPSA. Formalities have also been completed to fill up all the current vacant positions of IPSA including those of academic staff. The GOB has also assured that IPSA would go into the Revenue Budget from July, 1996. The convocation, degree awarding ceremony of IPSA is scheduled to be held on 24 June 1995.

IPSA has attained a certain degree of sustainability and the Government of Bangladesh is committed to develop the institute as a Centre of Excellence in the field of agricultural education and research. With the enactment of IPSA Act, IPSA has virtually begun its journey anew.

However, Joint Evaluation Team considers that some sort of support from JICA will be beneficial to boost IPSA's development and sustainability, especially in the fields of maintenance of equipment, research and education program, and academic and management staff training.

IPSA is becoming a sustainable institution in terms of organizational, educational, research and technical points of view, due to the untiring and streneous efforts and contributions of the people from Japan, USA and Bangaldesh who were associated with the IPSA project.

1 PURPOSE OF THE EVALUATION

The Purposes of the evaluation are as follows :

(1) to assess the overall performance and impact of the Institute of the Postgraduate Studies in Agriculture (here-in-after IPSA), Project Phase II. (The primary focus of the evaluation will be a period from the last tripartite evaluation to date, however, the entire period of the project including the Phase I must be considered in an evaluating result).

(2) to recommend measures to be taken by both the Japanese and Bangladesh governments concerning the sustainable development of IPSA.

(3) to provide feedback of the evaluation result for the further development of IPSA

(4) to provide feedback for use in the planning and implementation of JICA's future projects

2 TEAM COMPOSITION

(1) Japanese Members

The Joint Evaluation Team is composed of as follows:

i) Dr. Jun Sakai : Leader of the Joint Evaluation Team, Professor Emeritus, Kyushu University

ii) Mr. Seiji Utsumi : Vice-leader of the Joint Evaluation Team, Development Specialist, Japan International Cooperation Agency (JICA)

iii) Dr. Hisashi Yahata : Professor, Institute of Tropical Agriculture, Kyushu University

iv) Mr. Takao Noda : Science and International Bureau, Ministry of Education, Science and Culture

v) Mr. Tatsuo Fujita : Associate Development Specialist, Agricultural Technical Cooperation Division, Japan International Cooperation Agency

(2) Bangladesh Members

vi) Mr.Md.Enayet Hossain: Joint Chief, Planning Wing, Ministry of Agriculture

vii) Prof. Monirul Hoque : Member, University Grants Commission

viii) Mr. M.A. Mumin : Joint Chief, Crop Wing, Planning Commission, Ministry of Planning

ix) Mr. A.H.M.Gaziul Huq: Director, Implementation Monitoring and Evaluation Division, Ministry of Planning

3 EVALUATION METHODOLOGY

(1) The evaluation was conducted jointly by the members of both the Japanese and Bangladesh sides.

(2) The evaluation was conducted according to the evaluation guideline of JICA. The guidelines are as follows:

(a) The level of inputs and outputs provided for the project activities to attain purposes and goal of the project.

(b) Review actual versus planned progress toward outputs, purposes and goal of the project and assess the progress of the activities recommended by the tripartite evaluation report.

(c) Attempt to find the solutions to major constraints encountered for IPSA to be a sustainable institution.

(d) Recommend the future development plan of IPSA.

(3) The evaluation was conducted by means of interviews and discussions with personnel concerned, view of relevant documents and investigation of the facilities at IPSA.

## 4. BACKGROUND

### 4.1 Establishment of IPSA

The Government of Bangladesh (GOB) attaches top priority to the development of the agriculture sector to increase productivity in late 1970s, agricultural education, research and extension organizations were re-structured and reformed in order to adapt to advances of science and technology and to meet the needs of the country. Recognizing the need for highly skilled technical manpower in line with the agricultural development policy of the country, the GOB decided to establish the Bangladesh College of Agricultural Science (BCAS) in August 1980 to produce BS level graduates and requested the support from Govt. of Japan (GOJ) to establish the physical facilities for the new BCAS in Salna, Gazipur. In October 1983, the GOB made a decision that BCAS be transformed into a post-graduate school named the "Institute of Post Graduate Studies in Agriculture (IPSA)" with the responsibilities to offer courses leading to Master and Ph.D. degrees in various disciplines of agricultural science. As an affiliated institution of Bangladesh Agricultural University (BAU) and sub-ordinate organization of BARI, IPSA, started its function with the first batch of M.Sc. (Ag) students in July 1984. IPSA developed its physical infrastructures and research capabilities through active collaboration of JICA. USAID also contributed substantially to develop and implement improved graduate curricula. IPSA will serve as a "Center of Excellence" for post-graduate education leading to M.S. and Ph. D. degrees in selected fields of agricultural science based on basic and applied research undertaken to support and complement the national agricultural research system in Bangladesh. The first phase of the technical co-operation under JICA and USAID continued until July 1990. USAID assistance continued until October 1993 and JICA technical assistance will be completed in July 1995 in Phase II.

### 4.2 Co-operation of JICA and USAID

In response to the request of GOB, technical cooperation between JICA and GOB began on July 1985, in accordance with the Record of Discussions (R/D) mutually agreed upon. Before the termination of the Project, a Tripartite Evaluation was made jointly by the three governments in July 1989. Based on the recommendations of the Evaluation Team, the Government of Bangladesh requested JICA and USAID to continue the assistance for further five years (until July 1995) for further development of IPSA. Since the initiation of the Project, the assistance of JICA has been concentrated in the natural science fields and physical infra-structural development of IPSA, while USAID provided assistance in the social science fields curriculum development and staff housing construction.

In September 1993, the Second Tripartite Evaluation was conducted to assess the overall performance of the tripartite technical co-operation as a final evaluation for USAID and an interim evaluation for JICA activities for IPSA. The Evaluation

Team's report indicated that in spite of several difficulties and constraints, tripartite co-operation project was successfully implemented and made 17 recommendation to realize the objectives of IPSA Project.

4.3 Outline of IPSA:

(a) Location:

IPSA is located at Salna, Gazipur and is in close proximity to the Bangladesh Agricultural Institute (BARI) and Bangladesh Rice Research Institute (BRRI) from where it can mainly draw adjunct faculty member of IPSA.

(b) Departments:

There are nine academic departments offering M.S. and Ph.D. degree courses in agricultural science. The departments are:

(1) Agronomy; (2) Crop Botany; (3) Entomogy; (4) Genetics & Plant Breeding; (5) Horticulture; (6) Plant Pathology; (7) Soil Science; (8) Agricultural Extension Education; and (9) Agricultural Economics. In addition, Agriculture Statistics and Biometry department are offering courses as a supporting department. Besides, in August 1992 while formally approving the PCP (Project Concept Paper) of IPSA Project, Phase II Executive Committee of the National Executive Council (ECNEC) also directed the Ministry of Agriculture (MOA) to include three more disciplines - (i) Animal Science; (ii) Agro-forestry; and (iii) Fisheries Departments - in IPSA academic course curriculum. Accordingly in November, 1992, MOA has included the above three departments in the approved Project Proforma (PP) of IPSA.

(c) Campus:

The IPSA campus comprises about 80 ha. Physical facilities and experimental farm with a complete irrigation system is available for field experiments in IPSA. The new staff quarters are under construction in the campus and is expected to be completed by June 1996. A Master Plan for the campus development including physical facilities with faculty consensus is yet to be developed for IPSA for the efficient utilization of resources.

(d) Faculty and Staff:

As of April 1, 1995, there are 25 full-time faculty members at IPSA out of 49 sanctioned/approved posts. Complementing this IPSA core faculty, over 50 senior scientists from BARI, BRRI and other research and educational institutions are supporting teaching and supervising of thesis research on a part-time basis as IPSA's adjunct faculty. There are also 171 administrative

and other supporting staff in administration, farm, library, engineering and other sections.

(e) Students:

IPSA admitted as many as 469 students in M. Sc. (Ag) program under BAU curriculum. Out of which about 160 students graduated. There will be an intake of 60 students in M.S. and Ph.D. programs under the new curriculum.

The academic year consists of three terms - Summer, Autumn and Winter term. Students are admitted at each term. One of the important role of IPSA is to provide the opportunities of higher studies for in-service trainees. 87 in-service students including 12 students for Ph.D. course have been admitted in IPSA.

## 4.4 Present Status of IPSA

IPSA after its establishment in 1983 in Salna, started its function and students were admitted into M.Sc. (Ag) course of Bangladesh Agricultural University till 1990. Thereafter IPSA was converted into a separate autonomous degree granting institution based on course-based M.S. and Ph.D. curricula developed for IPSA with the approval of University Grants Commissions (UGC). IPSA Phase II project was approved by ECNEC on 5.8.1992 to strengthen academic, research and outreach activities at a total cost of Tk. 883.132 million with GOB"s contribution of Tk. 373.057 million. JICA's contribution to the project was made available under Grants and Technical Cooperation Program of JICA for IPSA. JICA assistance started flowing for IPSA in 1985 and will terminate in July 1995.

IPSA ordinance was approved and ratified as the IPSA Act by the parliament on January 1994 and March 1994 respectively. Since the IPSA Act was enacted, IPSA become a degree granting autonomous institution under the supervision the UGC and of the Ministry of Agriculture. The IPSA Act prescribes that the Prime Minister is a Chancellor of IPSA and the Chancellor appoint the Rector, equivalent to the Vice Chancellor of other universities. The Board of Regents were officially formed and headed by the Rector of IPSA, replaced to Management Committee, is the supreme body to look after the overall management of IPSA. The academic council chaired by the Rector is also established to administer academic program of IPSA. IPSA administration system in accordance with the Act has just started by the newly appointed Rector on April 5, 1995. As regards to the project administration, the record of discussion (R/D) signed between GOB and GOJ on June 1990, prescribes that the Secretary, MOA, bears over all responsibilities for implementation of the project. The Rector (Director) of the IPSA as a head of the project, is responsible for the administration and managerial matters of the project. Aside from the Board of Regents, the Co-ordination Committee has been established as per the provision of the R/D in order to interface between the project level decision making and resolution of issues beyond that level.

Rector has initiated actions to fill 24 faculty members, 6 officers, 20 staff of IPSA. They are expected to join by the end of June 1995. In the second phase, IPSA was funded the operation and development activities by Annual Development Plan (ADP) allocation which has been increased year after year. The total allocation from 1990 to 1995 was Tk. 261.6 million and the total expenditure was Tk. 228.9 million. Particularly in the 1992, Tk. 30.5 million of PL-480 fund for scholarship and residential housing construction were allocated from ADP. The major development activities were largely funded through technical assistance program of JICA.

Accordingly to the Project Proforma (PP) approved by the GOB, after June 1995, most of the IPSA's activities will be funded from revenue budget of the GOB. Since the housing construction of IPSA has been initiated four years behind the schedule due to some difficulties, the construction activities could not be completed by June 1995. The life of IPSA project has been extended by one more year i.e. FY 1995-96 to complete the incomplete house construction activities of IPSA by June 1996 and as such the project could not be transferred to Revenue Budget of GOB in June 1995. After June 1996, the IPSA project will be transferred to Revenue Budget of GOB with adequate financial allocation provision in order to meet one of the essential conditions of IPSA's sustainability beyond July 1996.

## 5. PROJECT DESIGN

### 5.1 Goals and Objectives of the Project

Goals of the project: The goal of the IPSA project phase II is "contributing to enhancement of higher agricultural education and agricultural research system in Bangladesh toward the accelerated agricultural development and to improve the economic well-being of the farmers" (Record of Discussions signed on June 14, 1990 between the GOB and GOJ).

The Fourth Five Year Plan of Bangladesh (1990-95) emphasizes on the re-organization of higher agricultural education system for qualitative improvement in the following manner: The objective of agricultural development can be realized only through the effective application of science and technology to the problems faced by the farming communities in their production programs, by developing high quality educational system for agricultural science. The improvement in the prevailing educational system is essential if progress and development are to occur in agriculture". Thus it is evident that the goal of the IPSA project quite fits into the national goal of agricultural development.

There exists a challenge to tailor the agricultural education programs to cater to the needs of Bangladesh farming community. Therefore, the IPSA project will play a vital role in meeting this challenge through establishing a balance between research and education.

Objectives of the project: The objectives of the IPSA project is "to strengthen post-graduate level agricultural research and education (leading to M.Sc. and Ph D) and to make IPSA a sustainable institution toward the achievement of goals". (R/D signed on June 14, 1990 between the GOB and GOJ).

The PP of the IPSA project approved by the GOB in November 4, 1992 stated the following objectives:

a. to establish and strengthen the IPSA to serve as a "Regional Center of Excellence" for Bangladesh and the neighboring countries providing quality education leading to M.S. and Ph.D. degrees in all of crop science, animal science, fisheries, forestry, and social science;

b. to conduct research on fundamental aspects of applied agriculture as conducted by various agricultural research organizations;

c. to complete the activities projected in the original IPSA project (1985-90);

d. to strengthen the national agricultural research system (NARS) by providing quality manpower and technical know-how generated by IPSA;

e. to disseminate innovation through training, workshops, publications, exhibitions, fields days, etc.

## 5-2 Tripartite Cooperation

In principle, JICA is responsible for the natural science-related fields and USAID is responsible for social science-related fields. This clear demarcation of responsibility is a key to successful implementation of the Joint Technical Cooperation. However, as required for the best interests of the project, through mutual consultation and agreement, there is some flexibility in said responsibilities between JICA and USAID.

Donor agencies have several restrictions relative to the implementation of the Project due to their own rules and particularly in the area of funding. Generally, all projects, regardless of source of funding eventually face budget limitations. However, the JICA-USAID joint effort makes it possible to apply the rules flexibly and to better cope with institutional constraints.

Furthermore, by planning for the use of resources from the GOB and the two donors in a fully integrated manner, the IPSA project not only had more funds than if only one donor had been involved, but the funds were committed so as to enhance the effectiveness of the available funds with respect to development objectives. For example, since the GOJ's Grant Assistance Program has a restriction for construction of residential housing, and the USA can support such action, construction was arranged by USAID with PL-480 funds.

As structured under the IPSA project, there were considerable exchanges with respect to management procedures and philosophy between all cooperating partners. Indications show that this diverse cultural background is of benefit to IPSA as it develops its own procedures and philosophy.

Of course, the joint effort approach does not solve all problems and remove all bottlenecks. Indeed, it may have its own unique drawbacks. For instance, the JICA-USAID joint technical cooperation in the IPSA project, if it is to be successful, requires more discussion and more meetings than single donor cooperation if concerns and views of all partners are to be taken into account adequately. However, in the case of the IPSA project, whatever drawbacks exist with tripartite cooperation, the advantages outweigh them easily.

## 5-3 Program Activities

Since the production of high skilled manpower is required for strengthening the National Agricultural System in Bangladesh,

IPSA was established as a research oriented educational institution. In order to attain the goal of the project as well as to meet such a demand of the nation, IPSA has been implementing the following programs :

1. Research Program
2. Academic Program
3. Outreach Program
4. Institutional Development Program

These Programs are not operated separately, but are interacted closely with each other. For the practical education, co-ordination of theory and practice is the essential requirement. IPSA's education program is emphasizing laboratory work and theses research to prove and to develop theories.

IPSA has an obligation to disseminate research in efficient manner. The outreach program will organize such activities. New technology and knowledge developed by research activities flows to the students and beneficiary groups through outreach activities. In turn, a better understanding of the needs and recognition of problems faced by the target person from outreach programs feedback into the research and teaching system to strengthen and invigorate the research and search for knowledge.

The activities under Japanese Technical Co-operation are outlined as :

(1) Research Program

One of the important mandates of IPSA is to conduct agricultural research. Since IPSA was established for producing high quality skilled manpower to support the National Agricultural System in Bangladesh, research activities have been a foundation of this high quality post-graduate education program. IPSA has put great emphasis on basic research rather than applied research.

The main research programs in IPSA are as follows :

a. Agronomy
b. Genetics and Plant Breeding
c. Plant Pathology
d. Soil Science
e. Horticulture
f. Entomology
g. Crop Botany

(2) Academic Program

The Academic Program in IPSA is aimed;

a) to give technical advice to IPSA teaching staff in order to improve the teaching and advising methods for student research and experimental activities in M.S or Ph.D Program;

b) to give technical guidance for preparing teaching materials including writing of the textbooks;

c) to give technical guidance and advice on lectures to IPSA teaching staff;

d) to give technical guidance and advice for arranging curriculum, especially related to experimental activities;

(3) Outreach Program

The outreach program in IPSA, as designed under Japanese Technical Co-operation, is aimed.

a) to give technical guidance and advice to IPSA teaching staff on training of agricultural researches, extensional personal and teaching staff of agricultural institutions.

b) to hold seminars for agricultural researched and IPSA students

c) to hold seminars and field days for disseminating the results of the project to agricultural extension personnel and farmers.

(4) Institutional Development

While the first phase of the IPSA project laid emphasis mainly on physical infrastructure development, the second phase will devote to manpower and organizational development through full utilization of facilities that have been created during the first phase.

The activities are as follows:

a. Promulgation of the IPSA Ordinance/Act to make IPSA an autonomous institution with degree conferring authority. To provide for an effective post-graduate program with strong research orientation, IPSA needs academic independence. While approving the first phase of the project, ECNEC recommended academic and administrative autonomy for IPSA.

b. Build up an administrative set-up in accordance with the PP and IPSA ordinance to assure an efficient implementation of education, research and outreach programs with necessary budget allocation.

c. Fill up the vacant posts of the faculty and staff and strengthen their capability through counter part training and providing guidance/advice of the JICA experts.

d. Continue with the development of experimental farms, expansion of the library facilities, upgrading of student laboratories, enlargement of computing center and the

construction of residential quarters and related infrastructures.

e. Establish formal linkage with other research and educational institutions to sustain research programs, exchange of scientists and faculty members, exchange of research results and feed back on academic research program requirements. Collaboration with other organization in research programs is an effective means of identifying researchable areas which could have immediate applicability and complementarity. Moreover close collaboration will tend to minimize duplication of research activities and enable the research organizations to proceed in the right direction. As IPSA is planned to become a "Center of Excellence", joint collaboration with related organizations both at home and abroad is considered essential to enhance its institutional viability.

f. Establish a comprehensive scholarship program to attract and retain the most qualified students, in particular female students.

g. Establish the equipment maintenance system. This is very important as sophisticated equipments have been established at the IPSA. Experimental aspect of research solely depends on the interrupted functioning of machinery.

## 6 ACCOMPLISHMENTS IN TERMS OF INPUT

### 6-1 Contribution of Japan

#### (1) Dispatch of Experts

A total of seventy highly qualified experts have been sent to the project from Japan aiming to improve practical working knowledge of the counterparts. Especially, the experts played important roles in helping the counterparts, design research plans and update the practical knowledge on laboratory equipments. The technical fields of the experts were in accordance with the Record of Discussions (R/D) and Tentative Schedule of Implementation (TSI).

The experts are classified into two categories as shown in the R/D, depending on the duration of duty in Bangladesh. One is long-term experts stationed in the Project for more than a year, and the other is short-term experts dispatched for a few weeks/months on some specific subjects. The general terms of reference (TOR) of the experts are as follows :

a. to provide necessary recommendations and advice on technical and administrative matters;

b. to provide technical advice for survey, planning and implementation of practical research and experimental activities conducted by IPSA teaching staff including farm management;

c. to provide technical guidance for the following academic activities of IPSA teaching staff;

   - o Improvement of the teaching and advising methods for research and experimental activities in M.Sc. or Ph. D programs.
   - o Preparation of teaching materials including writing of the textbooks.
   - o Arrangement of curriculum, especially, related to experimental activities.
   - o Improvement of library service and computer center.

d. to provide technical guidance for the outreach activities of IPSA teaching staff such as:

   - o training of agricultural researchers, extension personnel and teaching staff of agricultural institutions.
   - o Seminars for agricultural researchers and IPSA students etc.
   - o Seminars and field days for disseminating the results of the project to agricultural researchers, extension personnel and teaching staff of agricultural institutions.

In the second phase, 212 Man/Months (M/M) of long-term

experts and 61 Short-term experts (71 M/M) have been dispatched to the various fields from JICA.

Currently, there are nine active departments at IPSA. Each one of these department is charged with responsibilities of education, research, and outreach programs. In order to improve the quality of these program activities, the continuous motivations should be given to the C/P personnel together with the technical guidance so as to put their ideas into the practice and to develop their skills through the program activities with the experts.

In order to assist the development of the extensive programs in IPSA, a sufficient number of the experts have been assigned. As a result of the contributions by experts, abilities of the IPSA faculty and staff have been much improved, as indicated in considerable amount of output, such as the number of publications, number of the graduate students and their placement, publication of IPSA research journals, text books, etc.

However, the total number of long-term experts was insufficient. Although the number of the long-term experts was short, the short term experts complemented the roles of the long term experts.

(2) Counterpart Training

From Phase I through Phase II, most of faculty members and senior officers have been trained in Japan.

Nine faculty and staff members have completed training in Japan during the Phase I, and eighteen members have completed training in the Phase II period. Particularly in the second phase, training program primarily focused on the supporting staff such as administration officer, senior scientific assistants, and electric engineer in order to strengthen supporting services.

Candidates for counterparts training were identified in the selection committee chaired by the Director/Rector of IPSA in consultation with the JICA experts.

Most of the faculty and staff have successfully completed their training and have been well motivated in their own special fields. Their technical skills have been improved considerably by participating in the training programs. The results of the training have been applied directly or indirectly to the IPSA's program activities.

It is important to improve the systems for monitoring/ evaluation of the application of training results to the program activities and to share the results of training among the faculty and staff through seminar and presentation by the participants after the training.

(3) Dispatch of Survey Teams

a. Implementation Survey Team

Before starting the second phase, the Implementation Survey Team was dispatched from GOJ through JICA in June 1990. The purpose was to exchange views on contents and ways of cooperation for the Project Phase II in accordance with the recommendations of the First Tripartite Evaluation Team in July 1989. The Record of Discussion (R/D) was sighed on June 14, 1990 between the GOJ and GOB. The five-year technical cooperation project began as IPSA Project Phase II on July 4, 1990. In addition, Memorandum of Understanding was signed between JICA and USAID regarding Joint Technical Cooperation for the Project Phase II in response to the request of the GOB.

b. Consultation Survey Team

In October 1990, the Consultation Survey Team was dispatched to develop definitive plans for implementation of the Project Phase II. As a result of discussions by the survey team, IPSA faculty/staff, and the JICA and USAID experts, the Tentative Schedule of implementation (TSI) was set up. The team also discussed pending issues, which remained unsolved from the first phase.

c. Technical Guidance Team

In December 1992, the Technical Guidance Team was dispatched to review the progress and achievement of the Project activities. Based on the review of the project activities, the TSI was revised and various issues remaining unsolved were identified. Necessity to resolve these issues by the authorities concerned were recognized. Minutes of Discussions was signed between the Team and the IPSA Director. The team also attended the Coordination Committee chaired by the Secretary, MOA. At that meeting, the criteria of IPSA's sustainability was endorsed for the assessment of progress of the project.

d. Survey Team for maintenance and management of Equipment

The survey team for Maintenance and Management of equipment was dispatched in April 1991 and in April 1995. The team conducted a survey on the condition of the equipment of IPSA, repaired some equipment and provided suggestions/information for the maintenance of the equipment.

e. Tripartite Evaluation Team

The tripartite evaluation team was organized in August 1993 to assess the overall performance of the project activities in second phase. The team recognized the successful implementation of the project by considerable amount of out-put resulted from appropriate/sufficient in-put activities. 17 recommendations were made to accelerate the activities to attain the objectives of the project.

(4) Provision of Machinery and Equipment

Since IPSA is emphasizing practical education and problem solving oriented, one of the most important input was provision of instruments, equipment, and machinery.

However, basic facilities of IPSA, including buildings, were originally designed for the undergraduate education of BCAS as in the initial plan of GOB. Therefore, one of the major steps in the first phase was to make essential commodities meet the level required for postgraduate programs.

In the second phase, major machinery and equipment items were procured through the technical cooperation program and grant assistance program of GOJ/JICA to meet the demand of various kinds of program activities at IPSA. Equipment already provided has been installed in each of the subject matter laboratories, farm, and rooms according to research, education and outreach needs.

The provision of a number of micro-computers and related equipment by JICA and USAID has improved the computing capability at the institute. The computer center will expand its function for faculty, staff and students under the " Automation Plan" prepared by USAID. This plan enables IPSA to improve the management of several forms of information, such as manpower, research, inventory, library, student advisory, accounting.

These sophisticated pieces of equipment exceed, in quantity and quality, equipment in any other agricultural education and research institutions in Bangladesh. Consumption articles such as chemicals, glassware and stationary are stored in an air-conditioned room.

Considering maintenance availability, the basic idea on the provision of equipment is to eliminate hard-to-maintain equipment (select simple mechanism). In spite of this concept, the equipment selected was not always the most appropriate due to the non-availability and high price of imported goods in local market. However, several efforts have been made by the experts. Considering the available maintenance service, all computers and related equipment were procured in the local market. Repairing service of tractors, vehicles, gas generator and some laboratory equipment were purchased locally. Recently, three electric ovens and some other simple equipment items were manufactured in local workshop by supervision of the JICA expert. In terms of maintenance of equipment, this kind of approach is one of the most appropriate steps. It is important to consider market. More consideration should be given on the availability of spare parts in Bangladesh.

However, a sufficient number of items of equipment have already been provided to IPSA. The computerized inventory system was developed in cooperation with JICA experts in order to support maintenance and efficient use of the equipment.

## 6-2 Contributions of Bangladesh

### (1) Counterpart personnel

As per the Record of Discussions, the GOB was required to allocate the necessary number of well qualified personnel corresponding to each Japanese expert to be despatched by the GOJ for effective and successful transfer of technology under the project. During phase I and phase II (1985-95) of IPSA project, a total of 100 long-term (having a tenure of one year or more) Japanese experts for an aggregate man-months of 409.7 were despatched in various fields under IPSA-JICA technical cooperation project. In addition, 92 short-term Japanese experts (for a duration of few weeks to few months) were also fielded during April 1985 to March 1995 (Japanese FY). As against these Japanese experts, Bangladesh provided the services of 21 well qualified agricultural scientists/faculty members who worked with the experts as counter part personnel in numerous fields such as general management of IPSA project and in academic areas agronomy, genetics and plant breeding, plant pathology, soil science, horticulture, entomology, crop botany and farm management. It may be mentioned that one counterpart personnel worked with different experts on several occasions during the period.

Provision or engagement of counterpart personnel was satisfactory. Though a very large number of Japanese experts were fielded to improve the technical capability of IPSA, the level at which the transfer of technology was expected to take place perhaps did not occur. This will be manifested particularly in case of outreach program and maintenance of laboratory equipment. Thus there is need to prepare a need-based plan for utilization of the services of expatriate experts so that necessary HRD takes place.

### (2) Administrative Personnel

Consequent upon the agreement in R/D, GOB has provided necessary administrative personnel (for general management and administration as well as for finance and accounting), supporting staff and laborers for effective implementation of IPSA project. There has been a full-time Director/Rector who is responsible for the administrative and managerial aspects of IPSA. The project has an approved strength of 221 manpower, including 49 teaching posts (i.e. 10 professor, 25 Associate Professor and 14 Assistant Professor). Number of administrative personnel (officers and supporting staff) counts 172. As of May 1995, there are 25 full-time faculty members at IPSA against 49 sanctioned positions. Complementing this IPSA core faculty, over 50 senior scientists from BARI, BRRI and other research and educational institutions are supporting teaching and supervision of research thesis on a part-time basis as IPSA's adjunct faculty. There are also 144 administrative and supportive staff out of 172 posts assigned to supporting sections as a chief or deputy chief officer such as in administration, library, farm, engineering, security and

others. Besides, a considerable number of laborers are working in the experimental farm. Thus a total of 171 (25 academic and 146 supporting) staff have been recruited till May 1995. Efforts are underway to fill up all the vacant positions before the end of the project.

(3) Land and Buildings

The R/D provide that in accordance with the laws and regulations in force in Bangladesh, GOB will take necessary measures to provide at its own expenses land for the development of IPSA. GOB has donated about 80 ha of land for IPSA campus worth Tk. 136.78 million. During the first phase about 16 ha of land has been developed into a modern experimental farm with a complete irrigation system for interdisciplinary research. Greenhouse, net house and glasshouse were also established for the faculty and students research activities. Some basic physical facilities such as an administrative building, faculty building, laboratories, class rooms, library building, auditorium, students dormitories, cafeteria, medical centre and some staff housing occupy about 15 ha of land.

The following physical facilities have been created with GOB funds.

| Name of Work | quantity |
|---|---|
| Workshop | 1725 Sft. |
| Farm Garrage | 2275 Sft. |
| Cow shed | 660 Sft. |
| Barrack | 7 (Units) |
| Shahid Minar | ----- |
| Threashing Floor/Shed | 2250 Sft. |
| Student Dormitory | ------ |
| Gate House | ------ |
| Renovation of Guest House | ----- |
| Car Parking Shed | ----- |
| Generator House | ----- |
| Gas House | ----- |
| Engineering Building | ------ |

At present utilization of land at IPSA is not optimum as only about 31 ha are being used as against 80 ha in possession. This calls for preparation of a comprehensive land use plan which will include development of land for experimentation and farming crops including permanent horticulture/orchard crops and conservation of genetic resources. The land use master plan should also include creation of further facilities and renovations.

(4) Expenses for Implementation of the Project

The IPSA Project has been approved by the ECNEC of GOB at a cost of Tk.883,13 Million, of which cost of Tk. 373.06 Million

is funded by GOB for pay and allowances of the academic and administrative personnel, constructions of residential buildings, operation of academic and research programs, Payment of customs duty, etc. As of May 1995 an aggregate amount of Tk.271.98 Million out of Tk. 373.06 Million has already been spent.

As construction of the residential building has not been completed, GOB has decided to extend the life of the project for one more year from July 1995 till June 1996, so as to complete the residential buildings as well as to cover expenses for some of the essential work such as constructions of boundary walls, approach roads, installation of a power sub-station etc. This will cost an additional amount of Tk. 120-150 million and this will be financed from GOB sources.

According to the approved PP, GOB is committed to finance most of the operational activities of IPSA from its revenue budget, when IPSA will cease to continue as development project. This indicates that after the completion of IPSA as a project, GOB will provide an amount of TK. 30 million annually from the revenue budget on account of salary/allowances of the faculty members, supporting administrative personnel, academic and research programs of IPSA.

## 7. OUTLINE OF THE PROJECT ACTIVITIES AND ACCOMPLISHMENTS

### 7-1 Research Program

Since IPSA was established for producing high quality, skilled manpower and for providing basic research information to support the "National Agricultural Research System" in Bangladesh, research activity is one of the important mandates of IPSA in order to conduct basic/problem oriented research and also to establish foundation for high quality postgraduate education program.

(1) Research themes

In the second phase, a Consultation Survey Team, dispatched from JICA in October 1990, discussed the research programs with IPSA faculty members and worked out the "Tentative Schedule of Implementation (TSI)" in accordance with the R/D signed between GOB and GOJ on June 1990. The research programs were in the fields of Agronomy, Genetics and plant breeding, Plant pathology, Soil science, Horticulture, Entomology, Crop Botany and others. These research programs were selected on the basis of the national interests and the research background of the IPSA faculty members. Since the USAID was to withdraw from the project, the revised TSI was formulated in 1992. The main research themes in each department are shown in the TSI and the IPSA Five Year Research Master Plan.

(2) Research Management

In order to collect the research proposals from faculty members and to allocate the budget for them, the Research Coordination Committee was organized. The committee consists of the Rector of IPSA, JICA team leader, three faculty members and coordinator of JICA team. The committee, however, could not extend its function to the evaluation of research activities.

As regards the evaluation of research activities, the annual research review meeting has been held on annual basis to review the departmental research activities. The scientists from other research and educational institutes such as BARC, BRRI, and BAU were invited as commentators so as to evaluate the IPSA's research activities by the third party. Such an external evaluation will play an important role to improve the quality of IPSA's research activities. In the second phase, the review meetings were held three times, the first was held in December 1991, the second was held in August 1993, and the third was held in May 1995. The outline of the each review meeting was summarized and published as "Research Abstracts".

For strengthening and improving the management of research activities, the computerized Bangladesh Agricultural Research Information System (BARIS) was introduced in close cooperation with the USAID expert. The system enables IPSA to improve research planning, monitoring, evaluation, and budget allocations.

Appropriate farm management and maintenance of equipment are essential to support research activities of IPSA. A long term expert was dispatched from JICA and he contributed to the development of the farm of IPSA by conducting soil improvement, water management, maintenance and repair of both farm and agricultural machinery. However, the management system by IPSA staff. should be strengthen by authorizing them to have maneuverability to respond to demands in field experiments.

(3) Research Output

Based on the TSI and the research master plan, considerable research activities have been conducted during the second phase in cooperation with JICA experts and the universities in Japan.

Every department implemented a remarkable number of researches (Table 7-2-1) and some of them are of high quality level and useful for the academic and outreach programs (cf. Annex). Research outputs in each department are as follows;

Department of Agronomy

A total number of 13 JICA experts were dispatched to assist the researches and a large number of researches were conducted. Eco-physiological studies on crop production were successfully conducted. Photosynthetic characteristics and productive structure of mungbean and blackgram, and canopy structure and light interception pattern as sole crop as well as intercrop were elucidated. Two bold seeded, short duration, high yielding, synchronized maturing and YMV resistant mungbean varieties(NM92 and NM94) have been identified and are put under multilocation trial. Three short duration, high yielding long grain rice (IPK 2, IPK 4, and IPK 6) and one salt tolerant rice (IPK 11) varieties were also identified and put under multilocation trial.

Total of 54 scientific papers were published including 31 in international journals.

Department of Genetics and Plant Breeding

A total of 7 JICA experts were dispatched and various techniques were transferred concerning practical approaches for improvement of rice; cytogenetical analysis, mutation breeding, and variety development and so on. Through the substantial work, significant achievements were made. Some examples of research output are as follows: sources of male sterility in local Onion cultivar were identified and source material of cytoplasmic genetic male sterility (Ogura type) in Radish has been collected and being transferred to the local cultivars through crossing. About 500 genetic source materials of rice were collected and varieties with low non-digestible proteins were identified. Some mutants of rice with low non-digestible proteins and high protein mutants of mungbean were also identified. 57 of scientific papers were published.

It should be noted that one of the department members,

Associated professor, Dr. Ali, was selected as one to the best scientists in Bangladesh.

Department of Plant Pathology

The long term expert, Prof. Dr. Sugiura, contributed to the development of the department as well as in the overall management of IPSA project as the team leader. 11 JICA short term experts were dispatched and transferred various technique concerning electron microscopy as well as nematology, virology, fungal diseases, bacteriology. Among many research achievements, some examples are shown as follows. Several compounds of carbofurans and some organic amendments like mustard oil-cakes were standardized to control ufra nematode of rice and root-knot nematodes of rice, jute, and several other vegetable crops. Wild solanum species were selected to use as root-stock of eggplant and tomato to control root-knot disease. 27 research papers were published.

Department of Soil Science

Total number of JICA experts were 11, out of which two experts were dispatched twice or tripple. The study on effects of manuring on physical, chemical and microbiological properties of IPSA soil with alternate cropping of rice and wheat was regularly carried out. Water management was also carried out successfully with many crops by field experiments. Physical properties of soils representing different regions of Bangladesh was mostly carried out by the MS students. Experiments on microbial biomass were carried out at IPSA and eight soils were so far examined. In order to continue the job, the transportation for collecting soil samples is a big constraint. The effects of nodule bacteria and their nitrogen fixation were intensively carried out with different legumes. 26 research papers were published.

Department of Horticulture

Total number of JICA experts were 7, out of which one expert was dispatched twice. The following varieties were released as a variety by the National Seed Board; two lablab bean varieties as a "IPSA Sada Seem" and "IPSA Subuj Seem" cultivable year round (1991) and one guava variety as a "IPSA Payara" capable of year round fruiting (1995). There are many lines waiting for release such as early, mid and late season lines of cauliflower, two Brassica Greens capable of year round production, heat tolerant tomato lines capable of offseason production. Micropropagation technique for orchids and thuja was to be established. Total 43 research papers were published, out of which 16 were in foreign journals.

It is also to be noted that Assoc. Prof. Dr. Hossain received award from Bangladesh Association for Advancement of Sciences (BASS) for the best research paper presentation in the year 1992.

Department of Entomology

A total number of JICA short term experts was 8 and one long term expert was dispatched twice, so input of JICA experts was at satisfactory level, while only two counterparts from Bangladesh was provided. An illustrated monograph of the rice field spiders of Bangladesh was published in 1993. Hereditary basis of adult colour polymorphism in Nezara viridula, green stink bug, was determined and the genotypes were assumed. Two laboratory manuals on insect physiology and morphology were also prepared. Many species of insects were collected and the identified number of species is considered to be the top level in Bangladesh.

The equipment installed in the department was not so sophisticated and can be sustainable for future research. Number of research papers published was 34.

Department of Crop Botany

Three experts were dispatched from JICA and only two teaching staff were allocated in the department. This department was originally considered as a supporting department due to lack of teaching staff and it was difficult to distinguish the research items from that of other department such as agronomy, genetics and plant breeding, and horticulture. The research items of TSI were restricted to the studies of cucurbit probably due to shortage of counterpart at that time. Therefore, the two counterparts conducted their research not using cucurbit but using other crops and released totally 21 research papers.

As mentioned above, in the IPSA faculty members have successfully conducted many researches and have often contributed their research results to several domestic and international science journals. In the second phase, 256 papers were published and the figure may run up to 300 at the end of this year.

Faculty members also gave presentations at the professional meetings held outside IPSA. In August 1994, two faculty members presented their papers in the International Horticultural Congress held in Japan as a part of the C/P training program.

The IPSA science journal, "The Annals of Bangladesh Agriculture" has been published in biannual basis with JICA assistance, to disseminate the research results since June 1991. As of May 1995, a total of seven journals was published and the Vol. 4, No.2 is also about to be published in June 1995.

However, IPSA faculty members rarely have a chance to present their research results in the international science meetings and the international research journals as well as due to the none availability of such facility and support at IPSA.

(4) Manpower development and technical guidance of experts

In order to upgrade the research abilities of IPSA faculty member, a large number of JICA experts were dispatched to the

Project and counterparts training in Japan in accordance with TSI to enable the counterparts of Bangladesh to master the following:

a. approach to problem solving,
b. search for and reading of references,
c. planning/design, implementation and evaluation of the experiments,
d. interpretation of results,
e. writing of research reports and research papers.

Most of the IPSA faculty members have a training at Kyushu University and other universities in Japan to learn both basic and applied technical knowledges/skills to enable them to reach their full potential for high level research. In addition, five faculty members were awarded Doctoral degree through the scholarship program by the Ministry of Education of GOJ.

It must be noted again that two IPSA faculty members were awarded prizes individually for their reports at the 1992 annual meeting of Bangladesh Association for the Advancement of Science.

According to the results of self evaluation made by JICA experts, the activities of the research programme in every department were satisfactory (Table 7-1). The Team consider that the evaluation on the output of the research program is satsifactory in some fields but fair in Agronomy and Soil Science.

## 7-2. Academic Program

### (1) Introduction of New Course-Based Curriculum

One of the most significant achievement in the academic program of IPSA is the introduction of the new course-based curriculum and its implementation. The new course-based curriculum introduced at IPSA in August 1991, is based on the course-credit system. It is expected to improve the quality of post-graduate education.

The Annual system/Traditional system, followed by BAU and all other agricultural colleges brought on much criticism such as out-of-date syllabi, inflexibility, session jam, repetition of course content etc. The 'semester and course-based curriculum system' introduced by IPSA has a great impact on the students and these educational institutions. The advantages of the 'Semester and Course System' of IPSA are as follows:

a. the 'Semester and Course System' shows good results in a sense of producing graduates on timely basis;
b. the course system is more amenable to the incorporation of the up-to-date information and knowledge into a particular field that is the annual system;
c. students can, within the boundaries of requirement, choose courses which best fit their interest and career plans;

d. the system of examinations associated with the 'Semester and Course System' provide frequent feed back to both the students and teachers regarding their respective performance; and

e. being nearly two years program, Master degree of IPSA is expected to be of the international standard.

In-service and fresh graduate students prefer to apply to IPSA rather than to BAU, consequently, superior students would be admitted to IPSA.

A Ph.D. program has also been offered by four departments, namely, Agronomy, Genetics and Plant Breeding, Horticulture, and Plant Pathology. A new course-based curriculum has been implemented for both M.S. and Ph.D. programs. Degrees will be conferred by IPSA on candidates who fulfill all requirements for these programs. The position of Dean of Graduate Studies was established to provide leadership to the implementation of the new programs. Needless to say, these accomplishments are the result of the continuing efforts made from the beginning of the Project.

(2) Implementation of the New Course-based Curriculum

a. Academic calendar

The program for the M.S. degree usually requires at least five (5) consecutive terms and nine (9) consecutive terms in the case of Ph.D. candidates.

There are three terms starting in the Autumn, Winter and Summer of each academic year. Each term consists of twelve (12) weeks. IPSA plans to hold an academic calendar which has been established, and to-date has been implemented as planned except Winter '94 term. Indications are that timely implementation of programs will be possible in the future. Since most of the universities are behind in their academic calendars, timely implementation of IPSA's academic

calendar is a major accomplishment in the Bangladesh environment. The academic calendar initially laid out is shown in Table (1).

Table (1) IPSA Academic Calendar

| Term | Duration |
|---|---|
| 1. Autumn | August 14, 1991 to November 7, 1991 |
| 2. Winter | November 20, 1991 to February 17, 1992 |
| 3. Summer | May 6, 1992 to August 3, 1992 |
| 4. Autumn | August 19, 1992 to November 12, 1992 |
| 5. Winter | November 25, 1992 to February 25, 1993 |
| 6. Summer | May 5, 1993 to August 2, 1993 |
| 7. Autumn | August 11, 1993 to November 4, 1993 |
| 8. Winter | November 16, 1993 to February 8, 1994 |
| 9. Summer | April 16, 1994 to July 9, 1994 |
| 10. Autumn | July 25, 1994 to October 4, 1994 |
| 11. Winter | Not Implemented |
| 12. Summer | May 24, 1995 to August 1995 |

Program requirements, administrative procedures, test and grading procedures, courses offered and course descriptions are well articulated in the "IPSA Catalogue 1993 - 1995".

b. Admission

(1) Selection of the candidates

The candidates for admission to the M.S./Ph.D. degree course are selected by the Admission Committee as per recommendations of the respective departments. Each department evaluates the application based on the past academic performance (scores of B.Sc. Ag, HSC and SSC) and experience in their field of interest (in the case of in-service students) and the choice of the department indicated by the applicant. The maximum number of students to be admitted in a department in any particular term is determined in consideration of availability of teaching, research and other facilities at IPSA in order to maintain the quality of education.

(2) Number of the students

Whereas 479 M.S. students studied at IPSA under BAU affiliation, since implementation of the IPSA's new curriculum, 353 students have been enrolled to M.S. programs in nine academic departments and 17 students have been admitted to Ph.D. programs in four departments as on April 30, 1995 (Table 1-2-3)

One of the important roles of IPSA is to provide the opportunities of higher studies for in-service trainees.

Since introduction of course-based curriculum 64 in-service students have been enrolled and 17 students are enrolled in Ph.D. course.

c. Quality of Teaching and Faculty

(1) Faculty Members

Currently, there are 25 faculty member for 191 students in mini departments. All the IPSA faculty member either have a Ph.D. or M.S. degree. Besides, many of the academic staff have the experience of post-doctoral studies or technical training in Japan.

There are still 24 vacancies in the IPSA faculty. It is essential to fill these posts as early as possible in order to minimize the teaching load of each faculty member so that the faculty may contribute much time to conduct research programs.However, the IPSA faculty is rounded out by highly qualified adjunct faculty from BARI, BRRI, BAU, DAE, Dhaka University, among others. This arrangement has served as a stimulus for the IPSA faculty to improve their teaching skills. Teachers/student ratio is about 1:4 (excluding adjunct faculty) at present.

(2) Application of the research activities

Since IPSA aims at being research oriented educational institution, the IPSA faculty members have an obligation of conducting research program and students thesis research is largely involved in faculty's research activities. As a result, students have been able to enjoy close guidance of faculty and JICA experts. Some of their research thesis have published in science journals. The research activities of the IPSA faculty are also applied to the course work and students laboratories.

(3) Curriculum

Course-catalogue is often reviewed by the Board of Studies at each department and revised for the purpose of up-dating/improving the course work. The present IPSA catalogue (1993-95) is the third edition since introduction of new curriculum in 1991.

(4) Teaching reference

The manual of laboratory practices have been prepared mainly for the student laboratory practices in close collaboration with the JICA experts. Ten laboratory manuals so far have been published and seven more under preparation.

d. Facilities

All departments except agricultural economics have their

own student laboratory with a sufficient amount of equipment. Subject matter laboratories with sophisticated equipment are also available for students. A student computer laboratory equipped with micro computer is open from 8:00 a.m. to 10:00 p.m. New library building installed with books and journals is also open from 8:00 a.m. to 8:00 p.m. A 16 ha fully irrigated experimental farm is located in the campus for field experiments.

e. Placement of students

As of April 30, 1995, a total of 60 students have completed their graduation requirements for the M.S. degree under the new curriculum. The students graduated with M.S. degree have joined to agricultural research institutions or extension department of MOA (Table ৭-২-৮). It may be too early to make a complete assessment on the quality of the IPSA graduated students, it is ventured to conclude that IPSA graduates are recognized as quality manpower for research institutions and that the research based academic program combined with the course-based curriculum is appropriate for producing high quality manpower in Bangladesh.

(3) Financial support for students

a. Stipend

Presently, all the M.S. and Ph.D. students are given Tk. 250 - Tk. 300 and Tk. 450 - Tk. 500 respectively as a stipend on monthly basis. Besides, the students, who obtain the first place in each term in their respective departments, are given additional amount of Tk. 800 for three months in the following term as incentive.

b. Scholarship

Financial support to the graduate students is considered to be an important element in attracting and retaining quality students. This has been recognized by the concerned authorities and a provision of financial assistance for the IPSA students have been prepared as a scholarship program by an endowment fund of PL-480 (Tk. 17 million). Amount of scholarship is Tk. 1,250 for M.S. and Tk. 1,750 for Ph.D. students per month.

c. Research assistantship

Research assistantship has also has been provided in accordance with PP of IPSA and has been operated from May 1993. The amount is the same as the scholarship program. This research assistantship program will improve not only students' research skill and financial situation but also IPSA's research quality as well as quantity.

(4) Academic administration

With the introduction of independent graduate program, a Board of Studies (BOS) for each academic department has been established. The BOS formulate courses of studies, sets academic standards for the departments and prescribes courses and research load for the students. The academic council provides policy guidelines for the institute's overall academic activities. A Dean of graduate studies who coordinates overall academic program established in 1991 act as a Chairman of the academic council.

(5) Convocation for conferring of degrees

The convocation of IPSA graduate students is going to held on June 24 1995 and the Prime Minister of the Government of the Peoples Republic of Bangladesh as Chancellor of the IPSA will inaugurate the ceremony. It will be the first convocation of IPSA and it will be one of the most significant achievements of the IPSA project.

7-3 Outreach Program

(1) Activities

Since the beginning of the project, the outreach program has been recognized as one of the main activities of the project. IPSA has an obligation to disseminate its research results to the society in order to accelerate the agricultural development and improve economic well-being of the farmers.

According to the R/D, there are three kinds of activities of the outreach program;

a) to give technical guidance and advice to IPSA teaching staff on training of agricultural researchers, extension personnel and teaching staff of agricultural institutions.

b) to hold seminars for agricultural researchers and IPSA students, etc.

c) to hold seminars and field days for disseminating the results of the project to agricultural extension personnel and farmers.

Japanese experts helped their counterparts to execute the outreach program. They gave advices on workshops. They also helped to publish experimental manuals. An example of significant outputs of such activities is "trainers training on grafting technology and production of tomato and egg plant" held in March, 1994.

JICA experts held seminars for students and researchers of other concerning institutions on the recent topics of

agriculture.

Seminars or field days by JICA experts targeting agricultural extension personnel and farmers were not executed.

Besides the above mentioned activities, faculty members of IPSA made presentations for seminars and workshops held at other institutions. Even a total of 266 publications by IPSA faculty members (1990-1995) can be classified as the activity a) above.

(2) Accomplishment

As a whole, the objective of this program has been achieved to some extent. Seminars, workshops, training and publications by IPSA faculty members and JICA experts, even if they didn't have a direct purpose for outreach program, contributed very much to the diffusion of the results of research activities.

Finally, it should be noted that the team and IPSA personnel have maintained different ideas about the outreach program. The team believes that the activities like holding seminars, training or publishing of research findings should be enough to achieve the objective of the program. But the IPSA authority thinks that the objective of the program can not be achieved without disseminating specific practical techniques and knowledge through extension workers.

The self-evaluation (Table 7-1) by the Japanese experts is agreeable.

7-4 Institutional Development

As a result of the considerable amount of input support activities, IPSA has made a remarkable progress in institutional development as an educational and research institution. Activities and their achievements are as follows:

1) The IPSA Act was approved by the Parliament in January 1994, and it was ratified as an Act by the President of Bangladesh in March 1994. As per provision of the Act IPSA has become an autonomous institution with degree granting authority. This is a remarkable milestone in the history of IPSA.

2) IPSA restructured its administration in accordance with the IPSA Act. The IPSA Act prescribes that the Board of Regents headed by the Rector is the supreme body to look after the overall management of IPSA. The Academic Council chaired by the Rector was also established to administer academic affairs.

3) According to the approved Project Proforma of the second phase, a total of 221 posts for faculty and staff are approved by the GOB for IPSA.

As of March 31, 1995, there are 24 full-time faculty members out of 49 sanctioned posts at IPSA. In addition to the faculty members, there are 144 supporting staff members in administration, library, engineering, farm, security and others.

4) Minimum physical facilities have been developed with the assistance of GOJ and the USA. Administrative, faculty and library buildings, student laboratories, field laboratories and field office were constructed. The computer center and its capability were expanded. Equipment to cope with various types of research has been installed.

5) Linkages between IPSA and BARI, BRRI and BAU were formally established by MOU.

Thus the institutional development of IPSA has been achieved a great deal.

Self evaluation level of the activities performance in each depart are summarized in Table ๆ-ๆ.

## 8 SUSTAINABILITY OF IPSA

IPSA is an autonomous post-graduate institute having authority to confer M.S. and Ph.D. degree in agricultural science. In such a case, there is a historical fact that such an educational institution in a country may have definite sustainability for centuries. IPSA has to be planned, organized, facilitated and managed so as to have such a sustainable autonomy in Bangladesh.

### 8-1 Organizational Aspects

All higher education institutions in Japan such as colleges, universities and graduate schools, except training schools and/or courses, are under the systematic control of the Ministry of Education in order to produce as many and rich human resources as possible to the society. The staff are required to utilize their all ability to research and education inside the campus of his/her institution, while the Ministry of Agriculture, Forestry and Fishery (MAFF) in Japan has their offices with research and experimental organizations and suitable training and extension functions in order to promote the national agriculture. However, in Bangladesh, IPSA was organized under the Ministry of Agriculture to give graduate education to in-service and fresh students in the field of agriculture.

One of basic ideas of organizing a better institution of higher education and research is to develop an harmonized democratic system of management supported by academic and general administrative staff led by Director/Rector. Because, the academic staff ought to be a specialist of education and research in his specialty, while the general administrative staff ought to be a specialist of regulations and laws in the operation and management of his/her office.

From the view points of such organizational aspects mentioned above, IPSA project is evaluated as follows ;

(1) In consequence of the IPSA Act enacted in January 1994, IPSA has been fully autonomous institution of post-graduate study in agricultural education. The promulgation of the IPSA Act is the remarkable development in the Second Phase of the IPSA Project.

(2) IPSA has been playing an important role in the field of agricultural education and research to disseminate the research results through a large number of research papers and manuals published in national and international journals as an admirable outreach activity.

(3) IPSA has also been playing an important role to turn out the graduates as valuable human resources in order to contribute to the development of agricultural science and technology to support not only national but also international agriculture.

(4) These contributions of IPSA are widely recognized by relevant people and societies in Bangladesh.

(5) A new administrative set up consisting of the Board of Regents, Academic Council, and other important authorities/committees, has been organized at IPSA in the Second Phase following the IPSA Act and IPSA has started to function with new strength in all areas.

(6) IPSA faculty members and staff are also cooperative with the Rector to establish well functioning administration to support necessary program activities of IPSA.

Major changes of the IPSA administration are as follows ;

a. Meeting of the Board of Regents is regularly held.
b. Academic Council assumes full responsibilities for the academic programs.
c. Measures are being taken to appoint a Registrar and a Treasurer.
d. Twenty four vacant positions of faculty are expected to be filled by the end of the project.
e. The convocation, degree awarding ceremony of IPSA is scheduled to be held on June 24, 1995.
f. The collaboration with the UGC, BARI, BRRI and other institutions would be much more than before.
g. The master plan of IPSA for the next five years is being prepared.

8-2 Financial Aspects

Phase II project was scheduled to terminate in June 1995, but it has been extended by GOB for another one year up-to June 1996 to complete the incomplete construction works.

Consequently, after June 1996 as indicated in the current IPSA's PP, most of the Institution's activities will be funded from revenue budget of the GOB. This is the one of essential conditions for IPSA's sustainability beyond June 1996.

8-3 Technical Aspects

As a result of the intensive technical cooperation program through the JICA experts and providing the C/P training program in Japan, sufficient knowledge/skills have been transferred to the IPSA faculty and staff for implementing/developing the program activities. For example, considerable number of research papers contributed to both domestic and foreign journals, proceedings and so forth may indicate that the IPSA faculty members have gained capabilities for conducting research programs by themselves. In fact, two academic staff among twenty five faculty members were awarded as the best research scientists at the 1992 annual meeting of Bangladesh Association for the Advancement of Science.

Moreover, close relationships have been established between

IPSA and universities in Japan through many activities mentioned above. These relationship can be considered as one of the important resources enabling IPSA faculty to access/correspond easily with the Japanese scientists in order to solve technical issues faced on their program activities.

8-4 Physical Facility Aspects

High quality research and education programs of IPSA are based on the daily effort of the faculty and staff. Physical facilities such as laboratory, library, experimental farm and scientific equipment are one of most important factors to support the sustainable development of program activities.

IPSA is well equipped with modern/appropriate facilities to meet the many kinds of requirement on agricultural research, education and outreach programs. Maintenance of these facilities and equipment is the key of IPSA's sustainability.

Nevertheless, equipment maintenance system as stated in R/D is not fully established yet at IPSA. The matter of maintenance should be taken more seriously by the faculty. Otherwise, IPSA will lose many of them in the near future and it will result in disruption of the program activities. The preventive measures such as periodical inspection, proper operation and regular use of the equipment should be implemented immediately at each department.

## 9 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations have been made by the Joint Evaluation Team after the review of IPSA operations and related documents:

(1) IPSA management has remarkably been improved in the second phase, especially in 1994 and 1995, except equipment maintenance system. Further improvement is needed in the overall management including experimental farms.

(2) Academic programs have suffered to some extent due to insufficient recruitment of necessary faculty members. These vacant positions should be filled up without further delay. Teaching capability of the existing departments should be strenghthened.

(3) Research activities have been successful to large extent as a result of smooth technology transfer from Japan to the counterparts in IPSA. However, there is need for further development of research capability in IPSA.

(4) Outreach activities have not been fully achieved. However, a large number of research papers and manuals have been published which can be very valuable references to other institutions and extension specialists.

(5) The sustainability of the IPSA has been obtained through establishment of better administration system according to IPSA Act.

(6) However, there have been delays in construction of staff housing in IPSA campus. Proper maintenance system of equipment and facilities in the campus is yet to be fully established.

(7) GOB budgeting in second phase has been satisfactory. However, necessary budgeting of GOB will be needed for sustainability of IPSA. Japanese assistance and collaboration for further development of IPSA as a Center of Excellence will also be needed.

(8) It will be beneficial for IPSA if some sort of technical support would be rendered from Japan, time to time, to help boost IPSA's development and sustainability. The team identified the following fields which will be considered as further supports from Japan:

   a. Maintenance of the equipment is a key issue and necessary measures should be considered.

   b. New academic staff in IPSA is going to be employed shortly. Further assistance from Japan to IPSA academic staff in research and educational fields. Also new IPSA's academic and management staff training

should be considered.

c. If necessary, additional support from Japan, including items shown above (8-a and 8-b) should be considered in accordance with GOB request.

(9) Basically, IPSA is becoming a sustainable institution in terms of organizational, financial, educational, research and technical points of view. The present technical cooperation by JICA ends on July 3, 1995, as scheduled.

(10) The team would like to appreciate the untiring and strenuous efforts and contributions of the people from Japan, U.S.A. and Bangladesh who were associated with the IPSA project.

## 2　実施協議調査討議議事録（R／D）

署名討議議事録

THE RECORD OF DISCUSSIONS
BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF BANGLADESH
ON THE JAPANESE TECHNICAL COOPERATION
FOR THE INSTITUTE OF POSTGRADUATE STUDIES
IN AGRICULTURE PROJECT (PHASE II) IN BANGLADESH

With regard to the recommendations of the Joint Tripartite Evaluation on the Technical Cooperation for the Institute of Postgraduate Studies in Agriculture Project dated July 24, 1989, the Japanese Implementation Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Professor Koji Wada, Dean of the Faculty of Agriculture, Kyushu University, visited Bangladesh from June 5 to June 15, 1990 for the purpose of working out the details of the technical cooperation program concerning the Institute of Postgraduate Studies in Agriculture Project (Phase II) in Bangladesh (hereinafter referred to as "the Project").

During its stay in Bangladesh, the Team exchanged views and had a series of discussions with the Bangladesh authorities concerned in respect of desirable measures to be taken by both Governments for the successful implementation of the Project.

As a result of the discussions, both parties agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Dhaka, June 14, 1990

Koji Wada

Professor Dr. Koji Wada
Leader,
Implementation Survey Team,
Japan International Cooperation Agency,
JAPAN

Dr. S. H. Khan
Director,
Institute of Postgraduate Studies
in Agriculture,
Ministry of Agriculture,
BANGLADESH

## THE ATTACHED DOCUMENT

### I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of Bangladesh will cooperate with each other in implementing the Project for the purpose of developing a sustainable institution to strengthen agricultural postgraduate education and relevant research in Bangladesh.

2. The Project will be carried out at the Institute of Postgraduate Studies in Agriculture (hereinafter referred to as "IPSA") at Salna, Gazipur.

3. The Project will be implemented in accordance with the Master Plan which is given in Section I of the Annex.

### II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense the services of Japanese experts as listed in Section II of the Annex through the normal procedures under the Colombo Plan Technical Cooperation Scheme.

2. The Japanese experts referred to in 1. above and their families will be granted in Bangladesh the privileges, exemptions and benefits no less favourable than those accorded to experts of third countries working in Bangladesh under the Colombo Plan Technical Cooperation Scheme.

### III. PROVISION OF MACHINERY AND EQUIPMENT

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for implementation of the Project as listed in Section III of the Annex through normal procedures under the Colombo Plan Technical Cooperation Scheme.

2. The Equipment will become the property of the Government of Bangladesh upon being delivered C.I.F. to the Bangladesh authorities concerned at the ports and/or airports of disembarkation, and will be utilized exclusively for implementation of the Project in consultation with the Japanese experts referred to in Section II of the Annex.

## IV. TRAINING OF BANGLADESH PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive at its own expense the Bangladesh personnel connected with the Project for technical training and/or study visit in Japan through normal procedures under the Colombo Plan Technical Cooperation Scheme.

2. The Government of Bangladesh will take necessary measures to ensure that the knowledge and experience acquired by the Bangladesh personnel from technical training and/or study visit in Japan will be utilized effectively for implementation of the Project.

## V. SPECIAL MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

For fostering the smooth promotion of the Project, the Govenment of Japan, in accordance with the laws and regulations in force in Japan, will take necessary measures through JICA to supplement a portion of the local cost expenditures such as those for minor construction work.

## VI. SERVICES OF BANGLADESH COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. In accordance with the laws and regulations in force in Bangladesh, the Government of Bangladesh will take necessary measures to secure at its own expense the necessary services of Bangladesh counterpart and administrative personnel as listed in Section IV of the Annex.

2. The Government of Bangladesh will allocate the necessary number of well qualified personnel corresponding to each Japanese expert to be dispatched by the Government of Japan as specified in Section II of

the Annex for effective and successful transfer of technology under the Project.

## VII. MEASURES TO BE TAKEN BY THE GOVERNMENT OF BANGLADESH

1. In accordance with the laws and regulations in force in Bangladesh, the Government of Bangladesh will take necessary measures to provide at its own expense:

   (1) Land, buildings and facilities as listed in Section V of the Annex;

   (2) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for implementation of the Project other than those provided through JICA under III above;

   (3) Transportation facilities and travel allowance for the official travel of Japanese experts within Bangladesh;

   (4) Suitably furnished accommodations for the Japanese experts and their families.

2. In accordance with the laws and regulations in force in Bangladesh, the Government of Bangladesh will take necessary measures to meet:

   (1) Expenses necessary for transportation of the Equipment within Bangladesh as well as for installation, operation and maintenance thereof;

   (2) Customs duties, internal taxes and fees imposed on the Equipment which are not exempted from such payment in Bangladesh;

   (3) Handling, clearing and any other charges imposed on the Equipment in Bangladesh;

   (4) All running expenses necessary for implementation of the Project.

## VIII. ADMINISTRATION OF THE PROJECT

1. The Secretary, Ministry of Agriculture, will bear overall responsibility for implementation of the Project.

2. The Director of IPSA, as Head of the Project, will be responsible for the administrative and managerial matters of the Project.

3. The Japanese Team Leader will provide necessary recommendations and advice on technical and administrative matters concerning implementation of the Project to the Head of the Project.
4. The Japanese experts will give necessary technical guidance and advice to the Bangladesh counterpart personnel on matters pertaining to the implementation of the Project.

5. For effective and successful implementation of the Project, the Coordination Committee will be established with the function and composition as referred to in Section VI of the Annex.

## IX. CLAIMS AGAINST JAPANESE EXPERTS

The Government of Bangladesh undertakes to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with, the discharge of their official functions in Bangladesh, except for those arising from willful misconduct or gross negligence by the Japanese experts.

## X. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.

## XI. TERM OF COOPERATION

The duration of technical cooperation for the Project under this Attached Document will be five (5) years from July 4, 1990.

# ANNEX I

## I. MASTER PLAN

### 1. Objectives of the Project

The project will be carried out for the purpose of strengthening postgraduate level agricultural research and education at IPSA and making IPSA a sustainable institution, thus contributing to enhancement of higher agricultural education and agricultural research system in Bangladesh toward the accelerated agricultural development and the improved economic well-being of the farmers.

### 2. Activities under Japanese Technical Cooperation

The activities under Japanese Technical Cooperation are as follows:

(1) Research Program in the following fields

- Agronomy
- Genetics and Plant Breeding
- Plant Pathology
- Soil Science
- Horticulture
- Entomology
- Crop Botany
- Others

a) To give technical advice for survey, planning and implementation of practical research and experimental activities conducted by IPSA teaching staff.

(2) Academic Program

a) To give technical advice to IPSA teaching staff in order to improve the teaching and advising methods for student research and experimental activities in M.Sc. or Ph.D. program.

b) To give technical guidance for preparing teaching materials including writing of the textbook.

c) To give technical guidance and advice on lectures to IPSA

teaching staff.

d) To give technical guidance and advice for arranging curriculum, especially related to experimental activities.

e) Others.

(3) Outreach Program

a) To give technical guidance and advice to IPSA teaching staff on training of agricultural researchers, extension personnel and teaching staff of agricultural institutions.

b) To hold seminars for agricultural researchers and IPSA students, etc.

c) To hold seminars and field days for disseminating the results of the Project to agricultural extension personnel and farmers.

## II. JAPANESE EXPERTS

1. Team Leader

2. Coordinator

3. Specialists in the fields of:

Agronomy
Genetics and Plant Breeding
Plant Pathology
Soil Science
Horticulture
Entomology
Crop Botany
Others

Note: 1) Long term specialists in the above mentioned fields will stay at IPSA for more than one year in the duration of the Project.

2) Short term specialists in the above mentioned fields may be dispatched when necessity arises for smooth implementation of the Project.

## III. LIST OF EQUIPMENT

1. Equipment, instruments, materials, and spare parts for laboratory and field research activities.
2. Agricultural machineries and materials for the teaching/experimental farm.
3. Audio visual equipment.
4. Books and other printed materials.
5. Vehicles.
6. Other necessary equipment.

## IV. LIST OF BANGLADESH COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Head of the Project (Director of IPSA)
2. Counterpart personnel (teaching staff) in the fields of:
   - Agronomy
   - Genetics and Plant Breeding
   - Plant Pathology
   - Soil Science
   - Horticulture
   - Entomology
   - Crop Botany
   - Others
3. Administrative personnel
   (1) Administration
   (2) Accounting
4. Supporting staff
   (1) Manager of teaching/experimental farm
   (2) Librarian
   (3) Engineers
   (4) Other staff
5. Laborers

## V. LIST OF LAND, BUILDINGS AND FACILITIES

1. Land

   Land for Campus of IPSA including teaching/experimental farm.

2. Buildings and facilities

   (1) Office(s) for Japanese Team Leader, Coordinator and Specialists

   (2) Laboratories

   (3) Class rooms and practice rooms

   (4) Library

   (5) Dormitory

   (6) Other necessary buildings and facilities

## VI. THE COORDINATION COMMITTEE

1. Functions

   The Coordination Committee will meet at least once a year and whenever the necessity arises, and review:

   (1) the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation formulated under the framework of this Record of Discussions;

   (2) the overall progress of the technical cooperation program as well as the achievements of the above mentioned Annual Work Plan;

   (3) major issues arising from or in connection with the technical cooperation program.

2. Composition

   (1) Chairman;

   Secretary, MOA or his designee

   (2) Bangladesh Side;

   a) Director General, BARI, MOA

   b) Director General, BRRI, MOA

   c) Executive Vice-Chairman, BARC, MOA

d) Division Chief (Agriculture), Planning Commission

e) Personnel concerned to be nominated by MOA

(3) Japanese Side;

a) Team Leader

b) Coordinator

c) Resident Representative of Bangladesh Office, JICA

d) Personnel concerned to be dispatched by JICA

(4) Member-Secretary;

Director, IPSA, MOA

Note: 1) The US advisor nominated by the Japanese Team Leader and the Representative of USAID Mission to Bangladesh will attend the Coordination Committee as members.

2) Official of the Embassy of Japan in Bangladesh and specialist nominated by the Japanese Team Leader may attend the Coordination Committee as observers.

Abbreviations:

MOA = Ministry of Agriculture

BARI = Bangladesh Agricultural Research Institute

BRRI = Bangladesh Rice Research Institute

BARC = Bangladesh Agricultutal Research Council

USAID = United States Agency for International Development

## EXPLANATORY NOTES ON THE RECORD OF DISCUSSIONS FOR TECHNICAL COOPERATION TO IPSA BY THE GOVERNMENT OF JAPAN

The Record of Discussions is in very general terms. The total size of the project in financial terms would be discussed among all concerned agencies/organizations/Ministries including the donor agencies and submitted as Project Proforma for clearance by PEC/ECNEC.

### II. DISPATCH OF JAPANESE EXPERTS

Dispatch of experts will be based on specific terms of reference for each expert developed in consultation with concerned IPSA faculty and Japanese Team Leader.

### III. PROVISION OF MACHINERY AND EQUIPMENT

In the process of selecting equipment, more consultaiton is required among the concerned parties for proper assessment of suitability from the viewpoint of program need and maintenance.

### IV. TRAINING OF BANGLADESH PERSONNEL IN JAPAN

Since improvement of capacity and performance of the teaching staff of IPSA in providing a high quality research base at the postgraduate level is of critical importance, it is suggested that JICA will propose to the Ministry of Education of the Government of Japan to reserve at least one Ph.D. scholarship offer per year for IPSA during the project period.

### VII. MEASURES TO BE TAKEN BY THE GOVERNMENT OF BANGLADESH

1. Transportation facilities to be provided for official travel of Japanese experts will, in most cases, be through the use of vehicles under this project. JICA will provide the travel allowances for Japanese experts whenever possible.

2. JICA also will assist in funding suitably furnished accommodation for the Japanese experts and their families.

### XI. TERM OF COOPERATION

IPSA Project Phase II as referred to in the Record of Discussions will be treated as a spill-over project during the Fourth Five Year Plan period from the Government of Bangladesh side.

ANNEX II

TENTATIVE SCHEDULE OF IMPLEMENTATION

I. Project Activities

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 1. Research Program | | | | | | |
| (1) To give technical advice for survey, planning and implementation of practical research and experimental activities conducted by IPSA teaching staff. | \| | — | — | — | — | \| |
| 1) Agronomy | | | | | | |
| 1- Tillage and stand establishment | \| | — | — | — | — | \| |
| a) Soil management and soil moisture conservation | \| | — | — | — | — | \| |
| b) Crop production technique | \| | — | — | — | — | \| |
| c) Fertilizer management | \| | — | — | — | — | \| |
| 2- Eco-physiology of crop production | \| | — | — | — | — | \| |
| a) Crop physiology | \| | — | — | — | — | \| |
| -Crop characters | | | | | | |
| -Photosynthesis and productivity | | | | | | |
| -Stress physiology | | | | | | |
| b) Plant nutrition | \| | — | — | — | — | \| |
| -Plant-soil relationship | | | | | | |
| c) Crop ecology | \| | — | — | — | — | \| |
| -Canopy structure and root system | | | | | | |
| -Crop competition | | | | | | |
| 3- Weed management | | \| | — | — | — | \| |
| 4- Improvement of seed quality | | \| | — | — | — | \| |
| 2) Genetics and Plant Breeding | | | | | | |
| 1- Practical approaches for improvement some characters | \| | — | — | — | — | \| |
| a) Rice : | \| | — | — | — | — | \| |
| -Screening of locally available rice germplasms for ESP | | | | | | |
| -Screening of mutant lines of rice for total protein and endosperm storage protein | | | | | | |
| -Screening of local germplasms and mutant lines for high lysine content | | | | | | |

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| b) Others :<br>-Onions:Hybrid varieties<br>-Egg plant:Disease and insect resistance<br>-Wheat:Nutritional improvement | | ├ | ─ | ─ | ─ | ┤ |
| 2- Utilization of plant tissue culture for plant breeding | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Haploid breeding by anther culture<br>-Development of homozygous lines of rice using haploid breeding technique<br>-Proliferation of male sterile onions by using tissue culture | ├ | ─ | ─ | ─ | ─ | ┤ |
| b) Somaclonal variation in regenerants | | | ├ | ─ | ─ | ┤ |
| c) Trial of remote hybridization by using plant biotechnology<br>-The comparison with conventional breeding and new techniques in egg plant and tomato | | | | ├ | ─ | ┤ |
| 3- Cytogenetical analysis of some crop plants | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Chromosomal behavior of trisomics | ├ | ─ | ─ | ─ | ─ | ┤ |
| b) Some cytogenetical observations of remote hybrids | | | ├ | ─ | ─ | ┤ |
| 4- Mutation breeding | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Rice<br>Development of mutant lines using physical and chemical mutagens | ├ | ─ | ─ | ─ | ─ | ┤ |
| b) Others<br>-Wheat:Development of mutant lines using physical and chemical mutagens | | | ├ | ─ | ─ | ┤ |
| 5- Improvement of dioecious and pulse crop | ├ | ─ | ─ | ─ | ─ | ┤ |

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 3) Plant Pathology | | | | | | |
| 1- Plant Nematology | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Ecological studies on plant parastics nematodes | | ├ | ─ | ─ | ─ | ┤ |
| b) Histopathological studies on nematode-infected plants by using EMs | | ├ | ─ | ┤ | | |
| c) Control of nemic diseases of major crops | ├ | ─ | ─ | ─ | ─ | ┤ |
| 2- Plant Virology | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Survey and monitoring of virus and MLOs diseases of major crops (Emphasize the Legumes and Vegetables) | ├ | ─ | ─ | ─ | ─ | ┤ |
| b) Identification and Classification of plant viruses and MLOs | | ├ | ─ | ─ | ─ | ┤ |
| c) Epidemiology of plant virus and MLOs diseases | | ├ | ─ | ─ | ─ | ┤ |
| d) Management and control of major plant virus and MOLs diseases | | | | | ├ | ┤ |
| 3- Fungal Diseases | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Isolation and identification of major soil-brone plant pathogens | | | ├ | ─ | ─ | ┤ |
| b) Isolation and identification of antagonistic micro-organisms from Bangladesh soils | | | ├ | ─ | ─ | ┤ |
| c) Evaluation of antagonistic micro-organisms against major soil-borne pathogens for bio-control | | | | | ├ | ┤ |
| d) Ecological studies on soil-borne plant pathogens | | ├ | ─ | ─ | ─ | ┤ |
| 4- Plant Bacteriology | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Survey and monitoring of bacterial diseases of major crops | | ├ | ─ | ─ | ─ | ┤ |
| b) Isolation and identification of plant pathogenic bacteria causing diseases of major crops | | ├ | ─ | ─ | ─ | ┤ |
| c) Bio-control of major bacterial deseases of major crops | | | | | ├ | ┤ |

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 5- Genetic Plant Pathology | | ⊢ | — | — | — | — ⊣ |
| a) Search of resistant plant materials against some plant diseases | | | ⊢ | — | — | — ⊣ |
| 6- Miscellaneous | | | | | | |
| a) Physiological studies of parasitism with selected fungal, viral bacterial diseases | | | | | | ⊢⊣ |
| 4) Soil Science | | | | | | |
| 1- Effects of manuring on physical and chemical properties of IPSA soils | ⊢ | — | — | — | — | — ⊣ |
| 2- Water management of different crops (wheat, maize, radish, carrot, mustard, onion and other upland crops) for IPSA and related soils | ⊢ | — | — | — | — | — ⊣ |
| a) Water requirement of crops by field experiment | ⊢ | — | — | — | — | — ⊣ |
| b) Water requirement of crops by lysimeter experiment | | | | ⊢ | — | — ⊣ |
| c) Soil management and tillage practice for increasing soil water storage | | ⊢ | — | — | — | — ⊣ |
| 3- Physical properties and constraints of eight soils representing different regions of Bangladesh | ⊢ | — | — | — | — | — ⊣ |
| 4- Mineralogical studies of Bangladesh soils relating to soil potentiality and soilgenesis | | | ⊢ | — | — | — ⊣ |
| 5- Estimation of microbial biomass of eighteen soils representing different regions of Bangladesh | ⊢ | — | — | — | — | — ⊣ |
| 6- The effectiveness of nodule bacteria and their performance for nitrogen fixation in different legumes (mungbean, cowpea, gardenpea, soybean and groundnuts) | ⊢ | — | — | — | — | — ⊣ |

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 7- Studies of soil microflora with special reference to nitrogen dynamic in Bangladesh | ├ | ─ | ─ | ─ | ─ | ┤ |
| 8- Evaluation and improvement of soil chemical fertility of upland soil | | ├ | ─ | ─ | ─ | ┤ |
| 5) Horticulture | | | | | | |
| 1- Collection, evaluation, maintenance and utilization of horticultural germplasm in Bangladesh | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Fruits | | | | ├ | ─ | ┤ |
| b) Vegetables | ├ | ─ | ─ | ─ | ─ | ┤ |
| c) Flowers and ornamental plants | ├ | ─ | ─ | ─ | ─ | ┤ |
| 2- Improvement of horticultural production | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Fruits | | | | ├ | ─ | ┤ |
| -Propagation:micropropagation, and rootstock | | | | | | |
| b) Vegetables | ├ | ─ | ─ | ─ | ─ | ┤ |
| -Improvement and development of vegetable varieties | | | | | | |
| -Management | | | | | | |
| -Seed production technology | | | | | | |
| c) Orchid culture and production of ornamental plants | | | | | ├ | ┤ |
| 3- Biotechnology in horticultural plant | ├ | ─ | ─ | ─ | ─ | ┤ |
| a) Micropropagation in vegetables,ornamentals and tropical fruit | ├ | ─ | ─ | ─ | ─ | ┤ |
| b) Virus free plant in vegetables, ornamentals and tropical fruits | | | ├ | ─ | ─ | ┤ |
| c) Somatic hybrid plants in various plants in Bangladesh | | | | ├ | ─ | ┤ |
| d) Somaclonal variations in economically important horticultural plants | | ├ | ─ | ─ | ─ | ┤ |

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 4- Hybrid varieties ($F_1$) in horticultural plants | \| | — | — | — | — | \| |
| a) Vegetables | \| | — | — | — | — | \| |
| 5- Taxonomy, classification and variety identification of horticulture plants in Bangladesh | | \| | — | — | — | \| |
| a) Cytogenetic studies in horticultural plants | | \| | — | — | — | \| |
| b) Chemotaxonomy of horticultural plants | | | | \| | — | \| |
| -Classification and variety identification by isozyme and DNA analysis in tropical fruits, vegetables and ornamental plants | | | | | | |
| 6- Use of growth regulators in horticultural plants | | | | | \| | \| |
| a) Plants propagation | | | | | | |
| b) Flowering | | | | | | |
| c) Fruit set | | | | | | |
| 6) Entomology | | | | | | |
| 1- Ecological studies | \| | — | — | — | — | \| |
| a) Insect pests | \| | — | — | — | — | \| |
| - Ecological and integrated control studies on boreres affecting legums | | | | | | |
| - Ecological and biological studies on insect pests including their natural enemies of important crops | | | | | | |
| b) Beneficial insects | | \| | — | — | — | \| |
| - Biological studies on pollination and utilization of insect pollinators for vegetable seed and oil seed production | | | | | | |

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 2- Classification and taxonomy | | | | | | |
| a) Establishment and management of referential insect collection | | | | | | |
| - Survey, collection and identification on important crop pests and their natural enemies | | | | | | |
| 7) Crop Botany | | | | | | |
| 1- Comparative studies of growth and development of cucurbits raised from seeds and vegetative organs | | | | | | |
| 2- Embryology | | | | | | |
| a) Application of phytohormones for flower initiation of cucurbits | | | | | | |
| b) A study of fruit setting behavior of cucurbits | | | | | | |
| 8) Farm management | | | | | | |
| 1- Farm development | | | | | | |
| a) Soil improvement | | | | | | |
| b) Germplasm garden | | | | | | |
| c) Experimental orchard | | | | | | |
| d) Landscape | | | | | | |
| e) Others | | | | | | |
| 2- Farm utilization | | | | | | |
| 3- Water management | | | | | | |
| 4- Maintenance and repair of farm | | | | | | |
| 5- Maintenance and repair of agricultural machinery | | | | | | |
| 9) Maintenance of equipment | | | | | | |
| 1- Operation and maintenance of equipment | | | | | | |
| 2- Repair of equipment | | | | | | |
| 3- Green house management | | | | | | |
| 4- Operation, maintenance and repair of electricity and other supply facilities | | | | | | |
| 10) Others | | | | | | |

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 2. Academic Program | | | | | | |
| (1) To give technical advice to IPSA teaching staff in order to improve the teaching and advising methods for student research and experimental activities in M.Sc. or Ph.D program | ├ | ─ | ─ | ─ | ─ | ┤ |
| (2) To give technical advice for preparing teaching materials including writing the textbook | ├ | ─ | ─ | ─ | ─ | ┤ |
| (3) To give technical guidance and advice on lectures to IPSA teaching staff | ├ | ─ | ─ | ─ | ─ | ┤ |
| (4) To give technical guidance and advice for arranging curriculum, especially, related to experimental activities | ├ | ─ | ─ | ─ | ─ | ┤ |
| (5) Others | ├ | ─ | ─ | ─ | ─ | ┤ |
| 3. Outreach Program | | | | | | |
| (1) To give technical guidance and advice IPSA teaching staff on training of agricultural researchers, extension personnel and teaching staff of agricultural institutions | ├ | ─ | ─ | ─ | ─ | ┤ |
| (2) To hold a seminars for agricultural researchers and IPSA students, etc. | ├ | ─ | ─ | ─ | ─ | ┤ |
| (3) To hold a seminars and field days for disseminating the results of the Project to agricultural extension personnel and farmers | ├ | ─ | ─ | ─ | ─ | ┤ |

II. Japanese contribution

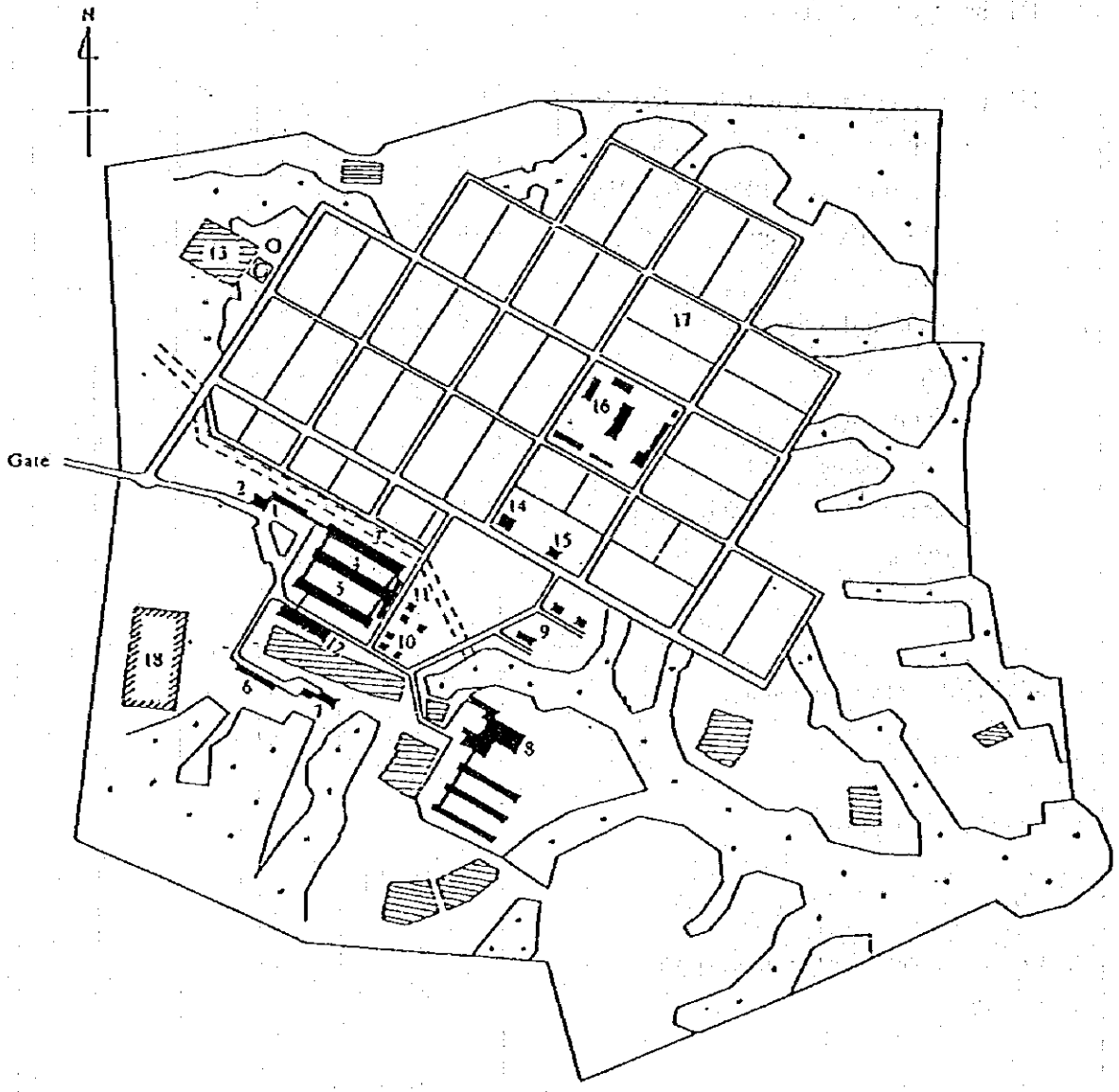
| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 1. Dispatch of Experts | | | | | | |
| [ Long-term ] | | | | | | |
| - Team Leader | | | | | | |
| - Coordinator | | | | | | |
| - Agronomy | | | | | | |
| - Genetics and Plant Breeding | | | | | | |
| - Plant Pathology | | | | | | |
| - Soil Science | | | | | | |
| - Horticulture | | | | | | |
| - Entomology | | | | | | |
| - Crop Botany | | | | | | |
| - Farm management | | | | | | |
| - Maintenance of Equipment | | | | | | |
| - Others | | | | | | |
| [ Short-term ] | | | | | | |
| - Agronomy | | | | | | |
| - Genetics and Plant Breeding | | | | | | |
| - Plant Pathology | | | | | | |
| - Soil Science | | | | | | |
| - Horticulture | | | | | | |
| - Entomology | | | | | | |
| - Crop Botany | | | | | | |
| - Farm Management | | | | | | |
| - Maintenance of Equipment | | | | | | |
| - Others | | | | | | |
| 2. Dispatch of Teams | | | | | | |
| - Consultation Survey Team | | | | | | |
| - Technical Guidance Team | | | | | | |
| - Interim Evaluation Team | | | | | | |
| - Evaluation Team | | | | | | |
| 3. Training of Counterparts Personnel in Japan | <Approximately three personnels a year > | | | | | |
| 4. Provision of Machinery and Equipment | | | | | | |

III. Bangladesh Contribution

| Categories | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|
| 1. Counterpart personnel | | | | | | |
| (1) Head of the Project | | | | | | |
| (2) Personnel in the following fields | | | | | | |
| - Agronomy | | | | | | |
| - Genetics and Plant Breeding | | | | | | |
| - Plant Pathology | | | | | | |
| - Soil Science | | | | | | |
| - Horticulture | | | | | | |
| - Entomology | | | | | | |
| - Crop Botany | | | | | | |
| - Farm Management | | | | | | |
| - Maintenance of Equipmeot | | | | | | |
| - Others | | | | | | |
| 2. Administrative personnel | | | | | | |
| 3. Land and Buildings | | | | | | |
| 4. Expenses for implementation of the Project | | | | | | |

# INSTITUTE OF POSTGRADUATE STUDIES IN AGRICULTURE

## CAMPUS MAP




LEGEND

1. Functional Building.
2. Auditorium.
3. Functional and Faculty Building.
4. Student Lab.
5. Faculty Lab. and Classrooms.
6. Workshop.
7. Medical Center and Cafeteria.
8. Student Dormitory.
9. Residential Quarter.
10. Service Station.
11. Nethouses and Greenhouse.
12. Library.
13. Reservoir.
14. Weather Center.
15. Insect Trap.
16. Farm Complex.
17. Experimental Field
18. Pond.

O Deep tube well pump.
⊠ Irrigation booster pump.

Brief History of IPSA

May 1979 : GOB planed to move Bangladesh Agricultural College (BAC) from Dhaka to Salna, Gazipur as a Bangladesh College of Agricultural Science (BCAS) in order to expand its capacities and requested GOJ for construction of college building and technical assistance of college education.

Aug 1980 : GOB changed its plan from "the move of BAC" to "newly-establishment of BCAS".

Mar 1983 : GOJ agreed to construct BCAS building in Apr. 1981 and completed its construction. GOJ also dispatched preliminary survey team for technical cooperation of BCAS.

Oct : GOB again changed its plan of BCAS from under graduate education to post graduate education as the "Institute of Postgraduate Studies in Agriculture (IPSA)" instead of BCAS,

Apr 1984 : GOB requested technical assistance for IPSA from GOJ.

Oct : IPSA started its operation. 1984.

Jul 1985 : Technical cooperation of GOJ began by Japan International Cooperation Agency (JICA).

Apr 1986 : The Government of the United States through the Agency for International Development (USAID) began participating in the project.

Oct 1988 : IPSA was independent from BARI.

Jul 1989 : Tripartite Evaluation was conducted by the three Governments and based on the recommendations of the Tripartite Evaluation Team, the Government of Bangladesh requested continuation of both JICA and USAID assistance for further years as the Phase II project.

Aug : The PPP of the IPSA Project was formally approved by ECNEC.

Jun 1990 : Record of Discussions was signed between GOB and GOJ for the IPSA Project Phase II technical cooperation until July 1995 by JICA.

Jul : University Vice-Chancellors meeting made a decision that IPSA will have an Ordinance with degree granting authority.

Oct : Tentative Schedule of Implementation (TSI) for Phase II technical cooperation was discussed and was agreed by GOB and GOJ.

May 1991 : Memorandum of Understanding was signed with BARI and BRRI.

Aug : New course-based curriculum has introduced to IPSA and began admitting students under its independent M.S. and Ph.D. programs.

Nov : The Project Implementation Letter was signed between GOB and USAID for IPSA Project Phase II technical cooperation until October 31, 1993.

Mar 1992 : New library, student laboratory and field laboratory buildings were constructed by GOJ grant assistance program.

Aug : PCP of IPSA Project Phase II was formally approved by ECNEC.
Nov : PP of IPSA Project Phase II was formally approved by DPEC.
Dec : Revised TSI was approved by GOB and GOJ.
May 1993 : The draft of the IPSA Ordinance was endorsed by the Cabinet and processed to the Ministry of Law.
Aug : Five Year Research Master Plan (1990-1995) was prepared and submitted to Bangladesh Agricultural Research Council (BARC).
Aug : The tripartite evaluation was conducted by GOB, GOJ and U.S.A.
Oct : USAID terminated its assistance.
Jan 1994 : The IPSA ordinance was approved by the President.
Mar : The IPSA ordinance was ratified as the Act by the parliament.
Oct : Winter Term was cancelled due to the administrative problem of IPSA.
Nov : Academic program of IPSA was closed by the office order of MOA.
Apr 1995 : New rector was appointed by the chancellor and the academic program was reopened.
May : The final evaluation was held by GOB and GOJ.
Jun : The first convocation will be held at IPSA.
Jul : The technical assistance of JICA will be terminated.

Table 6 - 1. List of the JICA Long-Term Experts Dispatched in Phase II

| F.Y. | No | Name of Expert | Subject | Duration | (M/M) | Position |
|---|---|---|---|---|---|---|
| 1990 to 1995 | 1 | Dr. Yoshihiro HIRASHIMA | Team Leader | 90. 7. 3 ~ 90. 8.30 | ( 1.9) | Kyushu University |
| | 2 | Dr. Miyoji SUGIURA | Team Leader | 91. 3.20 ~ 94. 3.19 | (36.0) | Kyushu University |
| | 3 | Dr. Bungo SAKAGUCHI | Team Leader | 94. 2.26 ~ 95. 7. 3 | (16.2) | Kyushu University |
| | 4 | Mr. Jitsuo TAKASUGI | Coordinator | 90. 7. 3 ~ 91. 9.15 | (14.5) | JICA |
| | 5 | Mr. Tomoyuki FUJII | Coordinator | 91.11. 6 ~ 95. 7. 3 | (43.9) | JICA |
| | 6 | Dr. Osamu HIROTA | Agronomy | 91. 9.11 ~ 93. 9.10 | (24.0) | Kyushu University |
| | 7 | Dr. Kazumi MAEDA | Agronomy | 94. 6. 1 ~ 95. 7. 3 | (13.1) | Kochi University |
| | 8 | Dr. Kazuo OGATA | Entomology | 93. 9. 2 ~ 95. 7. 3 | (22.1) | Kyushu University |
| | 9 | Mr. Nobuharu MORITA | Farm Management | 93. 3. 2 ~ 95. 3. 1 | (24.0) | JICA |
| | | | | Total | (195.7) | |

Table 6 - 2. List of the JICA Short-Term Experts Dispatched in Phase II

| F.Y. | No | Name of Expert | Subject | Duration | (M/M) | Position |
|---|---|---|---|---|---|---|
| 1990 | 1 | Dr. Fumitake KUBOTA | Agronomy | 90.10. 3 ~ 90.12. 2 | (2.0) | Kyushu University |
| | 2 | Dr. Waichi AGATA | Agronomy | 91. 3. 7 ~ 91. 3.28 | (0.7) | Kyushu University |
| | 3 | Dr. Hikaru SATHO | Gen.& Plant Breeding | 90.11.28 ~ 90.12.27 | (1.0) | Kyushu University |
| | 4 | Dr. Eizo ENDO | Plant Pathology | 90. 7.11 ~ 90. 9.10 | (2.0) | Saga University |
| | 5 | Dr. Kazuhiko EGASHIRA | Soil Science | 90. 9.12 ~ 90.10.22 | (1.3) | Kyushu University |
| | 6 | Dr. Takuya MARUMOTO | Soil Science | 90.10.17 ~ 90.12.21 | (2.2) | Yamaguchi University |
| | 7 | Dr. Motoki IKEDA | Soil Science | 91. 3. 7 ~ 91. 3.25 | (0.6) | Kyushu University |
| | 8 | Dr. Chiyoko OHOKUMA | Entomology | 90. 7.11 ~ 90. 8.22 | (1.4) | Kyushu University |
| | 9 | Dr. Katsura MORIMOTO | Entomology | 91. 3. 7 ~ 91. 3.27 | (0.7) | Kyushu University |
| | 10 | Dr. Yosuke TASHIRO | Horticulture | 90.10.31 ~ 90.12.10 | (1.3) | Saga University |
| | 11 | Dr. Nobumasa NITO | Horticulture | 90.12.20 ~ 91. 1.19 | (1.0) | Saga University |
| | 12 | Mr. Yoshimi HARAZAKI | Electron Microscope | 91. 1.13 ~ 91. 1.23 | (0.3) | JEOL Co., Ltd. |
| | | | | Total | (14.5) | |
| 1991 | 13 | Dr. Jiro Harada | Crop Science | 91.11.16 ~ 91.12.15 | (1.0) | Saga University |
| | 14 | Dr. Hirohumi SANEOKA | Crop Science | 92. 1.11 ~ 92. 4.24 | (3.5) | Hiroshima University |
| | 15 | Dr. Yutaka TAKAGI | Gen.& Plant Breeding | 91.12.14 ~ 92. 1.12 | (1.0) | Saga University |
| | 16 | Dr. Norimichi SAKO | Plant Pathology | 91.12.21 ~ 92. 1. 8 | (0.6) | Saga University |
| | 17 | Dr. Nobuyoshi ISHIBASHI | Plant Pathology | 91.12.25 ~ 92. 1.24 | (1.0) | Saga University |
| | 18 | Dr. Sadao KAWAGUCHI | Soil Science | 91.10. 2 ~ 91.11.15 | (1.5) | Kyushu University |
| | 19 | Dr. Takeo YAMAKAWA | Soil Science | 91.12. 4 ~ 92. 3. 4 | (3.0) | Kyushu University |
| | 20 | Dr. Junichi YUKAWA | Entomology | 91.12. 4 ~ 91.12.24 | (0.7) | Kagoshima University |
| | 21 | Dr. Akira WAKANA | Horticulture | 92. 2.15 ~ 92. 3.18 | (1.1) | Kyushu University |
| | 22 | Dr. Kei OHKUBO | Crop Botany | 91.11.16 ~ 91.12.15 | (1.0) | Kyushu University |
| | 23 | Dr. Takao SETSU | Landscape | 92, 1.11 ~ 92. 3.11 | (2.0) | Kyushu University |
| | 24 | Dr. Kei NAKAJI | Farm Management | 92. 2.15 ~ 92. 3.18 | (1.1) | Kyushu University |
| | | | | Total | (17.5) | |
| 1992 | 25 | Dr. Tomohiko YOSHIDA | Crop Science | 92.10. 2 ~ 92.10.30 | (0.9) | Kyushu University |
| | 26 | Dr. Akihiro NOSE | Crop Science | 93. 4. 4 ~ 93. 6. 4 | (2.0) | Ryukyu University |
| | 27 | Dr. Taizo ADACHI | Gen.& Plant Breeding | 92.12.21 ~ 93. 1.10 | (0.7) | Miyazaki University |
| | 28 | Dr. Kunimitsu FUJIEDA | Gen.& Plant Breeding | 93. 4. 4 ~ 93. 5. 2 | (0.9) | Kyushu University |
| | 29 | Dr. Noriaki MATSUYAMA | Plant Pathology | 92. 9.15 ~ 92.10.13 | (0.9) | Kyushu University |
| | 30 | Dr. Kei ARAI | Plant Pathology | 92.12.19 ~ 93. 1.10 | (0.7) | Kagoshima University |
| | 31 | Dr. Kazuhiko EGASHIRA | Soil Science | 92. 9. 2 ~ 92. 9.30 | (0.9) | Kyushu University |
| | 32 | Dr. Nobuhumi MIYAUCHI | Soil Science | 92.12.19 ~ 93. 1.10 | (0.7) | Kagoshima University |
| | 33 | Dr. Yoshio YAMADA | Soil Science | 92. 9.22 ~ 92.10. 7 | (0.5) | Kyushu University |
| | 34 | Dr. Osamu TADAUCHI | Entomology | 93. 1. 6 ~ 93. 3.15 | (2.3) | Kyushu University |
| | 35 | Dr. Yasuji KAJITA | Entomology | 92. 8.27 ~ 92. 9.23 | (0.9) | Kyushu University |
| | 36 | Dr. Yousuke TASHIRO | Horticulture | 92. 8. 5 ~ 92. 8.30 | (0.8) | Saga University |
| | | | | Total | (12.2) | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 37 | Dr. Toshihiro MOCHIZUKI | Crop Science | 93. 9. 1 ～ 93.12.10 | (3.3) | Kyushu University |
| | 38 | Dr. Tadahiko HURUYA | Crop Science | 93.11. 2 ～ 94. 1.31 | (3.0) | Kyushu University |
| | 39 | Dr. Hikaru SATOO | Gen.& Plant Breeding | 93.11.27 ～ 94. 1.12 | (1.5) | Kyushu University |
| | 40 | Dr. Mitsuro KAMEYA | Plant Pathology | 93.12.17 ～ 94. 1.14 | (0.9) | Yamaguchi University |
| | 41 | Dr. Kinji TANAKA | Plant Pathology | 94. 4. 8 ～ 94. 5. 4 | (0.9) | Saga University |
| 1993 | 42 | Dr. Kazuhiko EGASHIRA | Soil Science | 93. 9. 8 ～ 93.10.15 | (1.2) | Kyushu University |
| | 43 | Dr. Motoki IKEDA | Soil Science | 93. 9. 8 ～ 93.10. 4 | (0.9) | Kyushu University |
| | 44 | Dr. Yozo MURAKAMI | Entomology | 94. 2.22 ～ 94. 3.16 | (0.7) | Kyushu University |
| | 45 | Dr. Syuhei NOMURA | Entomology | 93.10.25 ～ 93.12. 5 | (1.4) | Kyushu University |
| | 46 | Dr. Eisuke MATSUO | Horticulture | 93.10.19 ～ 93.11. 7 | (0.6) | Kyushu University |
| | 47 | Dr. Kei OHOKUBO | Crop Botany | 94. 3.29 ～ 94. 5. 2 | (1.1) | Kyushu University |
| | 48 | Mr. Eiji KITAMURA | Electron Microscope | 93. 9.28 ～ 93.10. 9 | (0.4) | JEOL Co., Ltd. |
| | | | | Total | (15.9) | |
| | 49 | Dr. Humitake KUBOTA | Crop Science | 94.10.21 ～ 94.11. 9 | (0.6) | Kyushu University |
| | 50 | Dr. Hideki SUGIMOTO | Crop Science | 94.11.22 ～ 94.12.28 | (1.2) | Ehime University |
| | 51 | Dr. Syujiro SHIBAYAMA | Weed Science | 94.12.20 ～ 95. 1.13 | (0.8) | Saga University |
| | 52 | Dr. Tadao KATAYAMA | Gen.& Plant Breeding | 94.11. 9 ～ 94.11.27 | (0.6) | Kagoshima University |
| | 53 | Dr. Naoki MATSUZOE | Gen.& Plant Breeding | 94.11.22 ～ 95. 1.29 | (2.3) | Kagoshima University |
| | 54 | Dr. Takayuki TANAKA | Gen.& Plant Breeding | 94.12.13 ～ 95. 1.16 | (1.1) | Kyushu Tokai University |
| 1994 | 55 | Dr. Noriaki MATSUYAMA | Plant Pathology | 94. 7.20 ～ 94. 8.10 | (0.7) | Kyushu University |
| | 56 | Dr. Naruhito FURUYA | Plant Pathology | 94. 7.20 ～ 94. 8.21 | (1.1) | Kyushu University |
| | 57 | Dr. Junya ISHIBASHI | Plant Nutrition | 94. 9.28 ～ 94.10.19 | (0.7) | Kyushu University |
| | 58 | Dr. Kei MORIMOTO | Entomology | 94.10.14. ～ 94.11. 6 | (0.8) | Kyushu University |
| | 59 | Dr. Haruhisa INDEN | Horticulture | 94.11.22 ～ 94.12.11 | (0.6) | Miyazaki University |
| | 60 | Dr. Ikuo MIYAJIMA | Plant physiology | 95. 2. 3 ～ 95. 3.19 | (1.5) | Kyushu University |
| | 61 | Dr. Tatsuji KASAI | N-15 Analyzer | 94.10. 8 ～ 94.10.16 | (0.3) | JASCO Co., Ltd. |
| | | | | Total | (12.3) | |

Table 6 - 3. Man Months of Counterparts Training in Japan. (Japanese F.Y.)

| Field | Phase I | Phase II | | | | | | Total (M/M) |
|---|---|---|---|---|---|---|---|---|
| | 1985~90 | 1990 | 1991 | 1992 | 1993 | 1994 | Sub total | |
| Agricultural Extension | 0 | — | — | 9.0 | — | — | 9.0 | 9.0 |
| Agronomy/Plant Physiology | 8.6 | — | — | 8.3 | — | — | 8.3 | 16.9 |
| Corp Botany(Plant Hormone) | 0 | — | — | 10.4 | — | — | 10.4 | 10.4 |
| Entomology | 11.0 | — | 10.8 | — | — | — | 10.8 | 21.8 |
| Genetics & Plant Breeding | 11.3 | 11.5 | — | — | 9.7 | 0.9 | 22.1 | 33.4 |
| Horticulture | 22.3 | — | — | — | 6.9 | — | 6.9 | 29.2 |
| Plant Pathology | 9.5 | — | — | 8.3 | — | — | 8.3 | 17.8 |
| Soil Science | 8.9 | — | — | — | 22.5 | — | 22.5 | 31.4 |
| Farm Management | 8.4 | 11.0 | — | — | — | — | 11.0 | 19.4 |
| Maintenance of equipment | — | — | 8.0 | — | — | — | 8.0 | 8.0 |
| Agricultural Machinery | 1.6 | — | — | — | — | — | 0 | 1.6 |
| Observation Ture to Japan | — | — | 0.7 | — | — | 0.9 | 1.6 | 1.6 |
| Administrative Management | — | — | 3.0 | — | — | — | 3.0 | 3.0 |
| Personal Computer Instruc | — | — | — | — | — | 5.5 | 5.5 | 5.5 |
| Total | 81.6 | 22.5 | 22.5 | 36.0 | 39.1 | 7.3 | 127.4 | 209.0 |

T Table 6-4 Summary of major equipment supplied in Phase I and Phase II.

| | AGR | CBT | ENT | GPB | HOR | PLP | SSC | Others | Total |
|---|---|---|---|---|---|---|---|---|---|
| G | 7 | 15 | — | 4 | 7 | 11 | 3 | 55 | 102 |
| JR | 41 | 2 | 40 | 41 | 44 | 123 | 105 | 75 | 471 |
| L | 2 | — | — | 3 | 2 | 4 | 1 | 24 | 36 |
| Un | 10 | — | — | 1 | — | — | — | 4 | 15 |
| | 60 | 17 | 40 | 49 | 53 | 138 | 109 | 158 | 624 |

Abbreviations: Departments - AGR=Agronomy; CBT=Crop Botany; ENT=Entomology; GPB=Genetics & Plant Breeding; HOR=Horticulture; PLP=Plant Pathology; SSC=Soil Science; Classifications- G=Grant assistance; JR=Technical cooperations; L=Local purchase; Un=unregistered.

Table 7-1. Results of self-evaluation by JICA experts on input, activities, and output in research, academic, and outreach programs.

| Department | Inputs: Staffing | Dispatched experts | C/P training | Equipment supply |
|---|---|---|---|---|
| 1 Agronomy | II | I | III | I |
| 2 Genetics and Plant Breeding | IV | III | I | II |
| 3 Plant Pathology | III | I | II | I |
| 4 Soil Science | IV | I | II | II |
| 5 Horticuluture | III | II | II | II |
| 6 Entomology | IV | I | II | II |
| 7 Crop Botany | IV | IV | IV | III |

| | Activities: Research program | Academic program | Outreach program | Outputs: Reseach program | Academic program | Outreach program |
|---|---|---|---|---|---|---|
| 1 Agronomy | II | III | II | III | III | III |
| 2 Genetics and Plant Breeding | II | II | III | I | II | II |
| 3 Plant Pathology | II* | II | II | II | III | II |
| 4 Soil Science | II | III | II | III | III | III |
| 5 Horticulture | II | II | II | II | III | III |
| 6 Entomology | II | II | II | I | II | III |
| 7 Crop Botany | II | III | III | III | III | X |

I: quit satisfactory
II:satisfactory
III:fair
IV:incomplete
V:far from complete
X:impossible to evaluate
* denotes the average value of I and III for experts and C/P, respectively

Table 7-1-2 The number of publications of IPSA faculty (Japanese Fiscal Year)

| Department | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Total |
|---|---|---|---|---|---|---|---|
| Agronomy | 13 | 12 | 10 | 6 | 5 | 2 | 48 |
| Genetics & Plant Breeding | 17 | 11 | 11 | 9 | 7 | 2 | 57 |
| Plant Pathology | 4 | 5 | 2 | 8 | 8 | 0 | 27 |
| Soil Science | 2 | 7 | 2 | 4 | 1 | 10 | 26 |
| Horticulture | 10 | 6 | 9 | 7 | 10 | 1 | 43 |
| Entomology | 2 | 3 | 6 | 14 | 7 | 2 | 34 |
| Crop Botany | 3 | 5 | 3 | 4 | 0 | 6 | 21 |
| Sub-total | 51 | 49 | 43 | 52 | 38 | 23 | 256 |
| Agricultural Extension* | 0 | 1 | 4 | 0 | 2 | 0 | 7 |
| Statics & Biometry* | 0 | 5 | 0 | 0 | 0 | 0 | 5 |
| Total | 51 | 55 | 47 | 52 | 40 | 23 | 268 |

* Two departments were assisted by USAID

Table 7-2-2 Students Admitted (Ad) deffered (Df), dropped (Dp), continued (Cn) and graduated(Gr) drom 91 to 94 under IPSA Curriculum.

| Department | Autumn (August) 1991 | | | | | Winter (November) 1991 | | | | | Summer (May) 1992 | | | | | Autumn (August) 1992 | | | | | Winter (November 1992) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ad | Df | Dr | Cn | Gr | Ad | Df | Dr | Cn | Gr | Ad | Df | Dr | Cn | Gr | Ad | Df | Dr | Cn | Gr | Ad | Df | Dr | Cn | Gr |
| Agril. Econ. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Agril. Ex. Edc. | 6 | 1 | 2 | 0 | 3 | 4 | 0 | 1 | 1 | 2 | 4 | 1 | 1 | 0 | 2 | 3 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| Agronomy | 10 | 0 | 1 | 3 | 6 | 3 | 0 | 0 | 0 | 3 | 8 | 2 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Crop Botany | 4 | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entomology | 6 | 0 | 2 | 0 | 4 | 1 | 0 | 1 | 0 | 0 | 3 | 0 | 2 | 0 | 1 | 6 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gen.& Pl. Breed. | 8 | 0 | 2 | 1 | 5 | 1 | 0 | 0 | 0 | 1 | 5 | 0 | 2 | 2 | 1 | 5 | 0 | 2 | 3 | 0 | 2 | 0 | 2 | 0 | 0 |
| Horticulture | 10 | 1 | 2 | 3 | 4 | 3 | 0 | 1 | 0 | 2 | 8 | 2 | 2 | 0 | 4 | 6 | 1 | 3 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Plant Pathol. | 8 | 0 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 1 | 5 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Soil Science | 8 | 0 | 4 | 0 | 4 | 3 | 0 | 1 | 0 | 2 | 8 | 0 | 5 | 1 | 2 | 7 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Total | 60 | 3 | 17 | 11 | 29 | 16 | 0 | 4 | 1 | 11 | 39 | 4 | 16 | 5 | 14 | 32 | 9 | 11 | 8 | 4 | 5 | 1 | 3 | 1 | 0 |
| Applied | 148 | | | | | 72 | | | | | 311 | | | | | 139 | | | | | 27 | | | | |

Table 1. Cont'd...

| Department | Summer 1993 | | | | | Autumn 1993 | | | | | Winter 1993 | | | | | Summer 1994 | | | | | Autumn 1994 | | | | | Total (Aug. 91 to Win.94) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ad | Df | Dr | Cn | Gr | Ad | Df | Dr | Cn | Gr | Ad | Df | Dr | Cn | Gr | Ad | En | Df | Cn | Gr | Ad | Df | Dr | Cn | Gr | Ad | Df | Dr | Cn | Gr |
| Agril. Econ. | 10 | 0 | 2 | 8 | 0 | 2 | 0 | 1 | 1 | 0 | 4 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 4 | 0 | 8 | 0 | 0 | 8 | 0 | 28 | 0 | 3 | 25 | 0 |
| Agril. Ex. Edc | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 6 | 0 | 5 | 1 | 0 | 4 | 0 | 0 | 4 | 0 | 10 | 0 | 0 | 10 | 0 | 42 | 3 | 9 | 22 | 8 |
| Agronomy | 2 | 0 | 1 | 1 | 0 | 7 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 6 | 0 | 7 | 0 | 0 | 7 | 0 | 45 | 2 | 7 | 26 | 10 |
| Crop Botany | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 9 | 0 | 0 | 9 | 0 | 16 | 1 | 1 | 11 | 3 |
| Entomology | 5 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 4 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 10 | 0 | 1 | 9 | 0 | 36 | 3 | 12 | 16 | 5 |
| Gen.& Pl. Breed. | 5 | 0 | 1 | 4 | 0 | 3 | 0 | 0 | 3 | 0 | 7 | 0 | 4 | 3 | 0 | 2 | 0 | 0 | 2 | 0 | 7 | 0 | 0 | 7 | 0 | 45 | 0 | 13 | 25 | 7 |
| Horticulture | 3 | 0 | 2 | 1 | 0 | 8 | 0 | 2 | 6 | 0 | 9 | 0 | 3 | 6 | 0 | 4 | 0 | 0 | 4 | 0 | 6 | 0 | 0 | 6 | 0 | 58 | 5 | 15 | 27 | 11 |
| Plant Pathol. | 5 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 4 | 0 | 2 | 0 | 0 | 2 | 0 | 10 | 0 | 1 | 9 | 0 | 38 | 2 | 12 | 19 | 5 |
| Soil Science | 4 | 0 | 1 | 3 | 0 | 4 | 0 | 1 | 3 | 0 | 3 | 0 | 2 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 9 | 0 | 0 | 9 | 0 | 48 | 3 | 16 | 20 | 9 |
| Total | 34 | 0 | 13 | 21 | 0 | 28 | 0 | 5 | 23 | 0 | 41 | 0 | 19 | 22 | 0 | 28 | 0 | 1 | 27 | 0 | 76 | 0 | 1 | 75 | 0 | 369 | 19 | 98 | 201 | 58 |
| Applied | 118 | | | | | 121 | | | | | 54 | | | | | 35 | | | | | 137 | | | | | | | | | |

Table 7-2-3

## Academic Accomplishment

### 1984-90 (under BAU curriculum):

| Enrolled | Graduated |
|---|---|
| 479 | 200 |

### 1991-95 (under IPSA curriculum)

| | Total | MS | Ph.D |
|---|---|---|---|
| Enrolled | 370 | 353 | 17 |
| Deferred | 45 | 45 | 0 |
| Dropped | 74 | 71 | 3 |
| Graduated | 60 | 60 | - |
| Continuing | 191 | 177 | 14 |

Table 7-2-4 EMPLOYMENT RECORD

| Department | Employer | Number |
|---|---|---|
| Plant Pathology | BARI | 5 |
| | BRRI | 1 |
| | BSRI | 1 |
| | DAE | 2 |
| | | 9 |
| Genetics & Plant Breeding | BARI | 14 |
| | BRRI | 1 |
| | Sonali Bank | 2 |
| | DAE | 2 |
| | BJRI | 1 |
| | | 20 |
| Entomology | Bangladesh Sugar & Food Industrial Corporation (BSFIC) | 1 |
| | DAE | 7 |
| | BCS(Admin) | 2 |
| | Higher Study(ABROA) | 2 |
| | Collage | 1 |
| | BARI | 1 |
| | BRRI | 2 |
| | | 16 |
| Horticulture | BARI | 18 |
| | BADC | 5 |
| | DAE | 8 |
| | BAI | 7 |
| | Hazi Danas Agricultural Collage (HDKC) | 1 |
| | Patuakhali Agricultural College (PKC) | 1 |
| | | 38 |
| Agricultural Extension Education | NGO | 4 |
| | DAE | 7 |
| | Water Development Board (WDB) | 2 |
| | | 13 |
| Soil Science | BARI | 4 |
| | BRRI | 5 |
| | NGO | 4 |
| | BCS (Admin) | 3 |
| | | 14 |
| Agronomy | BARI | 21 |
| | BRRI | 2 |
| | BCS(Admin) | 3 |
| | Bangladesh petrolium Corporation | 1 |
| | Bangladesh Suggar Mills | 1 |
| | DAE | 4 |
| | Sonali Bank | 1 |
| | BJRI | 1 |
| | Ministry of information | 1 |
| | Collage | 1 |
| | IPSA | 1 |
| | | 37 |
| Crop Botany | Ministry ofi Establishment | 1 |
| | Patuakhali Agricultural College (PKC) | 1 |
| | NGO | 1 |
| | Higher Study (ABROAD) | 1 |
| | | 4 |

Table 7-3-1

# Research Activities and Seminars Titles of JICA Experts

Table II-3. List of research activities and seminar titles of JICA experts.

| Department of Agronomy | | |
|---|---|---|
| Expert | Research Activities | Seminar title |
| Kubota, F. | Effect of solar radiation on the production parameters and phytosynthetic rate in mungbean and black grams<br>Influence of water stres on the photosynthetic rate and growth parameters of mungbean | How to growth analysis of plants |
| Agata, W. | Planning of research program<br>Preliminary survey on weed flora | Physiological and ecological studies on photosynthesis and matter production in crop plants |
| Harada, J | Study on the growth of root system in wheat and on the soil moisture content | Morphological aspects of root systems of rice and soybean |
| Saneoka, H. | Varietal differnces in leaf cell membrane stability and water use efficiency of foxtail millet<br>Varietal differences in plant growth, nutrient uptake and root activity in rice | --- |
| Yoshida, T. | Pot culture experiments<br>Survey on upland crops | Some topics in malting barley and sweet potato new cultivars |
| Nose, A. | Improvement of research environment<br>Study on productivity of sugarcane<br>Study on photosynthetic traits of summer tomato | An improvement of sugarcane cultivation in subtropics |
| Hirota, O. | Study on the intercroppying system of mungbean and other crops | Canopy analysis by computer simulation |
| Mochizuki, T. | Classification of deep-water rice varieties by morphological and physiological characters<br>Survey and collecting of deep-water rice<br>Technology transfer of isozymic analysis | --- |
| Furuya, T. | Growth analysis of upland crops<br>Survey, collecting of legminous seeds | --- |
| Kubota, F. | Study on growth and photo-synthesis responces of mung-bean leaves to the increased concentration of salt in soil | Photosynthesis studies at Kyushu University: Recent progress and future strategy |

| | | |
|---|---|---|
| Sugimoto, H. | Analysis of root system of major field crops | Excess moisture injury of soybeans in drained paddy field |
| Shibayama, H. | Survey on weed flora<br>Ecological study on weed<br>Classification and identification of major weed | Prospect for improvement of integrated weed management (IWM) in rice |
| Maeda, K. | Research planning of Agronomy Department, with special reference to leguminous crops | [Some topics on the IDEO-TYPE of groundnut (to be scheduled)] |

| Department of Crop Botany | | |
|---|---|---|
| Expert | Reseach Activities | Seminar title |
| Ohkubo, K. | Plant hormone analysis | Dormancy and plant hormones |
| Ohkubo, K. | Advanced analytical method on plant hormones | Physiology of growth habit in lablab bean |
| Miyajima, I. | Biochemical study on plant flavonoid pigment, using HPLC | The practical use of high performance liquid chromatography (HPLC) in horticulture |

| Department of Entomology | | |
|---|---|---|
| Expert | Reseach Activities | Seminar title |
| Okuma, C. | Faunal survey on spiders of paddy fields<br>Classification and identification of spiders<br>Status of spiders as predators in agro-ecosystem | Paddy field spiders: their habits, classification and importance to IPM |
| Morimoto, K. | Survey on insect fauna using various traps<br>Survey on the ladybird beetles as predators<br>Preparation and identification of specimens | Recent development of pest control methods in Japan |
| Yukawa, J. | Study on gall and gall makers<br>Study of insect behavior using a video set | Biology and life history strategies of gall midges |
| Kajita, Y. | Study on white flies and their natural enemies | --- |
| Tadauchi, O. | Faunal survey on wild bees<br>Insect pest and their natural enemies of vegitable in dry season | Introduction of pollinating wild bees |
| Nomura, S. | Study on insect faunas under different agro-ecosystems<br>Study on aqatic insect fauna<br>Effectivness of hanging trap<br>Preservation and identification of insect specimens | Insect community in soil ecosystem |

| | | |
|---|---|---|
| Murakami, Y. | Study on the insect pests and their natural enemies of mango trees | Recent advances in the use of biological control agents under IPM in Japan |
| Morimoto, K | Survey on insect pest and their natural enemies of major crops<br>Faunal survey of insects under different environments<br>Establishment of referential collection | Systematic entomology, biodiversity and sustainable agriculture |
| Ogata, K. | Ecological study on insect pests of major crops<br>Agroecosystem and biodiversity of ants<br>Establishment of referential collections | [ in prep., title not fixed] |

| Department of Genetics and Plant Breeding | | |
|---|---|---|
| Expert | Reseach Activities | Seminar title |
| Satoh, H. | Evaluation of genetic resources for seed storage protein in rice by SDS-PAGE<br>Genetic vairation of seed storage protein in mungbean, lablab bean and wheat<br>Some physicochemical properties of endosperm starches in rice varieties | --- |
| Takagi, Y | Technology transfer of gradient gel electrophoresis<br>Technology transfer of total protein analysis<br>Polyploidization in Momordica species | Mutation breeding for quality improvement in soybean: Alternation of seed coat color and linolenic acid content |
| Adachi, T. | Isozyme analysis of mungbean<br>Protoplast isolation and culture<br>Anther culture in radish | Isozyme analysis and plant biotechnology |
| Fujieda, K | Introducing vegetable crop varieties<br>F1 hybrid breeding of radish using male-sterility<br>Advanced grafting technology, in particular, selection of rootstocks<br>Breeding method using standard pot media<br>Establishment of vinyl house and its maintenance | --- |
| Satoh, H. | Advanced methods for evaluation of genetic characters<br>Survey and collection of genetic resources in rice | Mutation breeding in rice |

| | | |
|---|---|---|
| Katayama, T. | Survey, collection and identification of genetic resources in rice<br>Ecological observation of field rice varieties<br>Preservation technique of seed storage | Taxonomy, evaluation and diversity of genus Oryzae |
| Matsuzoe, N. | Advanced technique of grafting<br>Stable production of grafting plant using mist irrigation system | Fruit quality of grafted tomato and vegetable production in desert area |
| Tanaka, T. | Cytogenetic technology transfer<br>Observation technique of chromosomes<br>Theory and practice of pollen tube observation | Introduction Horticultural Biotechnology |

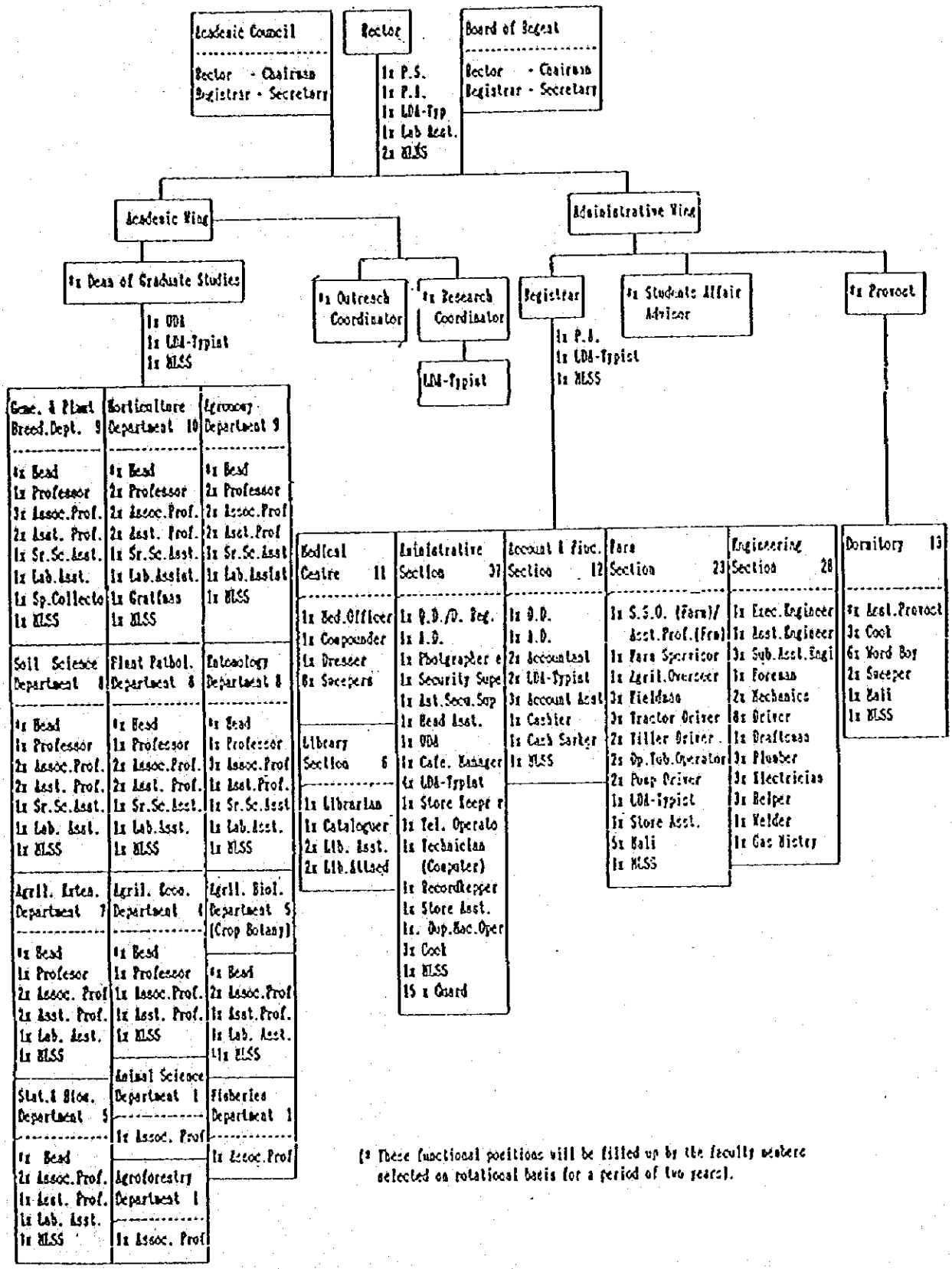
| Department of Horticulture | | |
|---|---|---|
| Expert | Reseach Activities | Seminar title |
| Tashiro, Y. | Survey, collection, evaluation and preservation of gene resource of horticultural crops | --- |
| Nito, N. | Improvement of Papaya production (feasibilty study on mass propagation, pollen development, surface and inner structure of pollen, etc)<br>Ethylene analysis of Sapota fruit | Establishment of embryonic callus in Citrus for further feasible studies |
| Wakana, A. | In vitro propagation of papaya and guava<br>Grape cultivation<br>Floral biology in mango<br>Isozyme analysis in horticultural crops<br>Pollen tube behavior in Brassica | --- |
| Tashiro, Y. | Tissue Culture of potato, garlic and orchid<br>Investigation of commercial products of potato and garlic | --- |
| Matsuo, A. | Survey on floricultural market<br>Tissue culture | 1) Propagation and production of trumpet lily<br>2) Horticulture and the human life |
| Inden, H. | Experiment on soilless culture<br>Experiment of tissue culture<br>Experiment of isozyme analysis for Brassica<br>Experiment on simple evaluation methods fo nutrient condition of plant or soil | Varietal differentiation of the Japanese bunching onion (Allium fistulosum L.) |

| Department of Plant Pathology | | |
|---|---|---|
| Expert | Reseach Activities | Seminar title |
| Kondoh, E. | Ecological study on plant parasitic nematodes | --- |
| Sako, Y. | Purification of gamma globulin and preparation of conjugate<br>Field visit and virus disease survey | --- |
| Ishibashi, N. | Development of culture of root-knot nematodes on explant tranformed root<br>Collecting fungivorous nematode | Integrated biological control of soil pests by beneficial nematodes |
| Matsuyama, Y. | A rapid detection of phytopathogenic bacteria<br>Extraction of the bacterial substance from Solanum sp. | --- |
| Arai, T. | Technology transfer of maintenace and operation Electron Microscope, and preparation of samples | --- |
| Kameya, M. | Survey and monitaring of virus amd MLOs disease of major crops<br>Diagnose and identification of causal virus disease by serological and biological methods | Diagnosis of virus disease in soybeans |
| Tanaka, K. | Collection and isolation of soil-borne pathogen | Postharves disease of onion in Saga Prefecture |
| Matsuyama, Y. | The identification of fungi with direct colony thin layer chromatograph<br>The isolation of antibiotics from wild Solanum spp. | Recent advancement of plant pathological research in our laboratory at Kyushu University |
| Furuya, N. | Technology transfer of bacterology (media preparations; inoculation technique; identification)<br>Study on the race of Pseudomonas solanacearum | Biological control of Bacterial Wilt of tomato and bacterial seedling rot of rice by Pseudomonas glumae |

| Department of Soil Science | | |
|---|---|---|
| Expert | Reseach Activities | Seminar title |
| Egashira, K. | Efficient use of rainfall water of the Kharif season to rabi crops<br>Soil physical properties after become constraint to crop production | --- |

| | | |
|---|---|---|
| Marumoto, T. | Survey on typical soils of different areas and analysis of relation between available nutrient status and microbial biomass<br>Effect of the longterm manuring on soil fertility, microbial biomass, and crop productivity<br>Analysis of the degradation character under different temperatures | --- |
| Egashira, K. | Water management of different rabi crops in terrace soil<br>Effects of long-term manuring on physical and chemical properties of terrace soil<br>Physical properties of selected soils representing different upland regions | --- |
| Kawaguchi, S. | Native clay-fixed ammonium contents and fixation of added ammonium in some representative Bangladesh soils | --- |
| Yamakawa, T. | N-15 tracer techniques using emission spectrometry<br>Assay methods for Acetylene Reduction Activity<br>Sampling and analytical methods for soil sample on soil texture, pH and elements, on Acetylene reduction Activity, Nitrate Reduction Activity | --- |
| Yamada, Y. | Technical advises to reseach program | Introduction to minor elements |
| Miyauchi, N. | Preliminary survey for K-fixation research in IPSA | --- |
| Egashira, K. | Research review on: water and soil management of different rabi crops; effect of long-term manuring on the physical and chemical properties of Terrace Soils; physical properties of main Bangladesh soils | Cosmos, earth, and soil |
| Ikeda, M. | Plant nutrition research, in particular, introduction and establishment of hydroponic culture | Shading effects on nitrate utilization in non-nodulated soybean during pod fill |
| Ishizuka, J. | Hydroculture and N-15 tracer technique | --- |

Fig 7-4-1 ORGANOGRAM OF INSTITUTE OF POSTGRADUATE STUDIES IN AGRICULTURE (IPSA)




(* These functional positions will be filled up by the faculty members selected on rotational basis for a period of two years).