

供与された機材は、各学科の研究室、学生実験室、農場等に設置され、学生、教官に使用されている。ただ、試薬、実験器具等は教官が占有しているとの指摘もあり、適正且つ民主的な管理が望まれる。

バングラデシュには、実験機器を扱う業者が非常に少なく、機種も限られている。そのため、現地調達を促進し業者を育成するため、製作が容易で機能が簡便な恒温機が、長期専門家の指導で現地業者により製作され、実験に利用されている。

また、本プロジェクトには、日本製の精密機械（電子顕微鏡等）が供与されている。バングラデシュ国内には精密機械を扱う業者が育成されていないため、どうしても現地調達は困難である。プロジェクト終了後の維持管理につき早めに対策をとる必要がある。

4) ローカルコスト負担

フェーズⅡの1992年度までの総額は、4,159万円であり、この中に農場事務室建設（258万円、1991年度）、技術交換（106万円：1991年度、149万円：1992年度）そして、応急対策（網室補修、210万円：1992年度）等が含まれ、プロジェクト活動の推進に貢献している。

1993年度も現地セミナー、現地語教科書作成そして応急対策（温室改修）を予定している。特に、温室改修は学生及び教官実験に不可欠であり、早急な対応が望まれる（表3）。

5) バングラデシュ側の投入実績

カウンターパートの配置は、1992年12月の巡回指導調査団が報告しているように、日本で研修したカウンターパートは全員復職、IPSAの発展に貢献している。ただし、アメリカで学位を取得した遺伝育種学の講師が退職しており、職位の違いによる問題が指摘された。

バングラデシュ側が負担した予算は、1990年7月から1993年6月までの合計は142百万Tkであり、117.6百万Tkが支出されている。しかしながら、研究・教育費はわずか全予算の4.9%しかなく、その多くが人件費や建設・補修費に当てられている（表4）。研究・教育を中心としたIPSA運営を考えると研究・教育費は、さらに増大されるべきであろう。IPSA側が負担した建設・補修は、農場の屋根付コンクリート乾燥場、農場車庫、キャンパス内フェンス等であるが、フェーズⅠに比較してIPSA側のプロジェクトに対する負担額は増えつつある。

6) 三国協力

本プロジェクトは、フェーズⅠより日・米・バの三国合同プロジェクトとして実施されてきている。その協力活動は日本側をシニアパートナー、アメリカ側をジュニアパートナーとしてそれぞれ自然科学分野、社会科学分野に活動を分担してきた。また、施設建設、機材供与等に関しても協議・調整し、効率的に重なることなく実施してきた（3-4 他の協力期間との関連参照）。

プロジェクト運営に係る合同委員会は一年間に1～2回であったが、プロジェクト内での調整会議は月に1～2回実施され、日米間の協力体制は密接に連携していた。しかし、USAIDは、政策の変更・資金の縮小・所長の交代等により、1991年11月に協力期間を1993年10月まで

とすることを「バ」国政府に通知し承諾を得、同プロジェクトからの協力終了を確定した。本プロジェクトは、フェーズⅠの終了時評価（三国合同評価）の際、フェーズⅡの5年間も三国協力を実施する旨が勧告されており、1995年7月までUSAIDが協力する予定であったが、フェーズⅡ開始（1990年7月4日）から1年4ヶ月経過した1991年11月6日に「バ」国から協力終了の承諾を得て1993年10月に協力を終了することは、事実上の撤退と言える。

USAID側は、今回の合同評価の結果、IPSAへの協力は予定通り完全に終了したとしているが、まだ職員宿舎の未着工、農業経済学科・コンピュータトレーニング及び科目制カリキュラムの改善等で協力継続の必要性が散見された。USAIDの担当分野については、日本側は活動範囲に含めずバングラデシュ側が独自に担当することが今回の合同評価で確認された。

また、本プロジェクトに関しては、各国それぞれの書類に基づき実施しているため（日・バ：R/D、バングラデシュ：PP、USAID：MINI PROJECT PAPER）、上位目標・プロジェクト目標等に認識の違いが存在している。ログフレーム（三国協力活動部分）に各書類の目標の違いを記しており、三国合同評価調査団では、その違いを確認し評価作業を行った。

表4 バングラデシュ側投入実績 (1)

:1990-91 Fiscal Year:

Sl.No.	Name of Account	Budget Allocation	Expenditure
1.	Salary of Teacher, Officer, and Employees	Tk.25,16,000.00	Tk.25,08,000.00
2.	Allowance of Teacher, Officer and Employees	27,06,000.00	26,23,000.00
3.	Misc. Expenditure	53,87,000.0	53,65,000.00
4.	Expenditure about Student	1,94,000.0	1,73,000.00
5.	Expenditure on the Subject of Education	51,000.00	49,000.00
6.	Expenditure about Research purpose	11,46,000.00	11,40,000.00
7.	Misc. Construction	39,28,000.00	39,28,000.00
8.	Office Equipment	12,000.00	11,000.00
9.	Books and Journals	60,000.00	59,000.00
10.	CDST	60,00,000.00	76,19,000.00
Total Taka:		2,20,00,000.00	2,34,75,000.00

Unspend Tk. 16,19,000.00 of CDST allocation on 1989-90 has been spended on 1990-91 on 1990-91 financial year.

表 4 - 2

:1991-92 Fiscal Year:

Sl.No.	Name of Account	Budget Allocation	Expenditure
1.	Salary of Teacher, Officer, & Employees	Tk.41,40,000.00	Tk.38,82,000.00
2.	Allowance of Teacher, Officer and Employees	30,17,000.0	26,23,000.00
3.	Misc. Expenditure	1,28,81,000.0	1,09,88,000.00
4.	Expenditure about Student	4,12,000.00	2,74,000.00
5.	Expenditure on the Subject of Education	9,05,000.00	3,70,000.00
6.	Expenditure about Research purpose	36,45,000.00	25,57,000.00
7.	Misc. Constraction/Repair	81,80,000.00	81,39,000.00
8.	Office Equipment	19,00,000.00	18,89,000.00
9.	Ferniture	18,00,000.00	17,45,000.00
10.	Books and Journals	1,20,000.00	98,000.00
11.	CDST	1,30,00,000.00	1,30,00,000.00
Total Taka:		5,00,00,000.00	4,55,65,000.00

Unspend Tk. 44,35,000.00 has been adjusted in the nest year.

表 4 - 3

:1992-93 Fiscal Year:

Sl.No.	Name of Account	Budget Allocation	Expenditure
1.	Salary of Teacher, Officer, & Employees	Tk.48,75,000.00	Tk.43,17,000.00
2.	Allowance of Teacher, Officer and Employees	37,33,000.0	31,58,000.00
3.	Misc. Expenditure	1,09,45,000.0	84,22,000.00
4.	Expenditure about Student	8,32,000.00	5,10,000.00
5.	Expenditure on the Subject of Education and Research	12,65,000.00	6,05,000.00
6.	Expenditure about Farm	33,50,000.00	18,14,000.00
7.	Expenditure for Residential House Constraction	1,35,00,000.00	—
8.	Misc. Constraction/Repair	60,00,000.00	50,39,000.00
9.	Ferniture	12,00,000.00	11,61,000.00
10.	Equipment	12,00,000.00	5,59,000.00
11.	Books and Journals	11,00,000.00	10,14,000.00
12.	Scholarship for Students	1,70,00,000.00	1,70,00,000.00
13.	CDST	50,00,000.00	50,00,000.00
Total Taka:		7,00,00,000.00	4,85,99,000.00

Total Budget allocation was Tk.700.00 Lakh

Total received Tk.575.00 Lakh

Unspend Tk.89,01,000.00 will be adjusted in the nest year.

5. 問題点と対応策

5-1 管理運営

IPSAの管理運営上特に問題となる点とその対応策を列挙すれば以下のようである。

- a) 職員不足による管理運営機能の停滞……有能な事務職員の採用とあらゆる事務のコンピューター化
- b) 教官不足による研究機能の不足……有能な教官の採用
- c) 予算の配分……研究予算のうちの少なくとも50%は教育研究用とし、そのうちのかなりの割合は年度当初に各学科へ配分し、学科長の裁量で自由に使用できることが必要である。
- d) 農場管理……専任の管理人を置き、農場の利用を希望する各学科から選出された委員をもって農場管理委員会を組織する。管理人(助教授クラス以上の人をもって当てる)は委員会の長となり、委員会は農場の運営に関するあらゆる問題を審議する。

農場内の私有地の問題を早期に解決し、フェンスを巡らせるなどの方法で盗難を防止する。

- e) 図書館の充実……図書館経費を飛躍的に増額することにより、書籍の増加を計り、事務員を補充し、サービスの向上に務める。

全ての業務をコンピューター化することによって能率を向上させる。

- f) 奨学金……奨学金を増額し、できれば、修士課程の学生には1000Tk/Month博士課程の学生には3000Tk/Month程度とする。また、優れた研究には研究補助金が支給できるような制度を設ける。
- g) JICAおよび我が国の協力大学はなるべく多くの長期専門家を派遣するように努力する。

5-2 研究計画

1) 研究課題

各学科で実施されている研究課題は、その計画段階で「研究調整委員会」に諮られ、ここでTSIで確定された研究計画との整合性が検討されている。従って、研究課題と上位計画との整合性に関しては疑問をはさむ余地はない。但し、農業経済学科が調査団に与えた研究課題5項目は「研究調整委員会」での審議を経していない。国家の第4次経済発展5ヵ年計画では、農業生産をあげるために、農村地域に自由市場経済を浸透させ、投資に見合う報酬が得られる社会経済組織を創り、価格政策を構ずることによって、農民にインセンティブを与えることを強調しているので、この政策と整合する研究課題が設定されなければならない。具体的には、次のような基礎的な調査研究が実施され、その結果に基づいて新たな農家支援方策が構ぜられるべきと考えられる。

- ① 農産物価格の季節変化の分析
- ② 農産物の流通経路と流通組織、及び流通段階別のマージン

③ 農業金融の構造と融資獲得の方法

④ アグリビジネスの現状と新経済活動のチャンス

2) 派遣専門家の派遣分野の時期

フェーズⅡにおける長期及び短期専門家の派遣は、1993年8月時点で累積151.7M/Mであり、残る128.3M/Mを1995年7月までに実施しなければならない。また、派遣された専門家の学科別配置状況は表に示したとおりであるが、学科別研究課題別に見ると濃淡がある。

IPSA側は、調査団に対して、長期派遣専門家の数が少ないこと、短期派遣専門家の派遣時期が日本の大学の学期末や夏休みに集中していて、IPSA教員の希望する時期と必ずしも一致していないと指摘された。派遣された長期専門家は、実験や研究の計画段階から結果の取りまとめまで指導することができ、カウンターパートの研究成果に結びついて、大いに喜ばれるが、短期(通常3~4週間)ではそこまではできない。しかし、できるだけIPSA側の希望に沿うよう九大をはじめ国内支援大学の協力が望まれる。また、今迄派遣されなかった研究項目に対しては特に考慮する必要があるだろう。

3) 新カリキュラムの導入に伴う教官の講義、学生指導、研究実施の時間配分の相剋

今回の巡回指導(中間評価)の期間中、IPSA教官との面談の機会があり、研究・教育活動の実態を聞いたが、各教官それぞれ、講義と学生の世話に忙しくて、実験の時間がなかなか取れない、という不満がきかれた。

1991年8月学期から新カリキュラムをベースにした講義が開始された。新カリキュラムはオレゴン州立大学から派遣された長期専門家が指導し、アメリカで実施されている制度をモデルに作成されたものであり、現行のIPSAカリキュラムがそれである。先に農業経済学科と農業普及・教育学科の場合を紹介したが、各学科で開講する講義科目と卒業に必要とする科目と単位数がきちんと定められている。各科目には簡単ではあるが100字前後のシラバスで説明が記されている。各科目に番号が付けられ、低位桁数値を初級レベルに、内容が高度化するに従い高位桁数の数値を付け、学生は低位桁数値の科目から受講するよう指導される。このシラバスにより、学生は開講される以前に科目の内容を予め知ることができ、特に選択科目の選定に便利である。また、学生は低位桁の科目から履修を始め、真面目に出席して講義を受け、所定の高位桁の科目を習得すれば、一応その分野の知識を修得したことになり、M. S.の学位を受ける資格を満たすことになる。従って特別に秀才でなくても努力すれば、高い学位を取得できる点に、この制度の優れた面がある。また一旦、社会人となった人が、再び大学へ戻って、高レベルの専門を身につけようとする場合にも好都合である。

4) 学生が教員の講義を評価する制度

今回のIPSA滞在期間中に、USAIDの長期専門家Dr. R. Witter(オレゴン州立大教授、1993年6~9月までIPSAプロジェクト滞在)は、学生が教員の講義の仕方や内容を評価する制度をIPSAに導入する目的で、そのモデルとなる質問事項を準備しており、その原稿を私に見せ

てくれた。この制度は、アメリカでは多くの大学で採用され、有効に機能しているようである。日本では少数の私立大学で試験的に行われたことがあると聞くが、国立大学ではその例を聞かない。日本の農学系大学院における教育方針は、講義よりも実験実習にウエイトをおき、それを基礎として学生が研究者に自立していくことを基本方針とする伝統があるからである。IPSAの教育方針としてアメリカ方式と日本方式のいずれがベターか、調査団の中で検討し、両方を合体した方式がベストであるとまとめた。この制度が導入されれば、教官は講義の準備にますます多くの時間をとられることになる。目下空席のポストに教官が配置されれば、教官の繁忙さは現状よりは改善されるけれども、学生指導に忙しくて研究や実験の時間がとれない、という基本的な問題は解決されないであろう。この制度の導入は十分な注意が必要である。

5-3 教育計画

(1) 教官定員の未充足問題

現在IPSAには22名の教官が在籍しているが、これは92年に採択されたIPSAの新整備計画に定める教官定員(49名)の半数にも満たない人数であり、教官人員の不足はIPSAの抱える最も深刻な問題の一つとなっている。とりわけ農業経済学科では本務教官が全くいないという異常な状況にあり、最近外部の講師が何らかの理由によって授業に来なくなったため、学科の学生がIPSAをやめてしまったというような遺憾な事態が発生したほどである。

このようにIPSAの教官リクルートは異常なほど遅滞しているが、阻害要因とに多くの理由があると思われるが、その理由の一つとして、現在の教官スタッフが、内部昇進の機会を確保するため外部からの教官リクルートに反対しているということが言われている。こうした様々な事情がリクルート停滞の背景にあるとすれば、問題のドラスティックな解決は容易でないと考えられるが、我が国としても折にふれて教官リクルートについて注意を喚起していくことが望まれる。何れにせよ、本年5月に行われた新聞紙上での教官公募の結果がどのようなものとなるか注目される場所である。

(2) 科学的な基礎教育の脆弱性

IPSAの教育活動に関し、とりわけ日本側関係者から指摘されている問題点として、教官・学生双方の科学的な基礎教育の脆弱性があげられる。これは、バ国における学部レベルの理科教育、さらには中等教育以前の理科教育に遡って由来するものであり、それだけにIPSAの内部だけで完全に解決できる問題ではない。しかしながら、95年のプロジェクト終了を目前にしてとりわけ懸念されている問題が、教官の実験器具・機器の操作能力の不足であり、我が国派遣専門家の撤退後の機器のメンテナンス問題に深刻な影を落としている。このため我が国としても、残りのプロジェクト期間中に、可能なかぎりIPSA教官の指導に努めるとともに、可能であればプロジェクト終了後についても、何らかの形で機器のメンテナンスや教官の指導について協力を継続することが望まれる。

また、学生に対しては、必ずしも「postgraduate studies」の位置づけにとらわれず、基礎的な科学実験に関する教育を充実する方策が望まれる。

(3) 学生に対する経済的助成・就職支援等

IPSAの学生には、経済的な助成を必要とする者が少なくない。現在、全ての学生がstipendを支給されているが、金額としては300Tk前後であり、生活に十分な額であるとは言いがたい。このため米国のPL-480基金に基づいた奨学金制度が計画されてきたが、現在にいたるまで支給されておらず、IPSA当局による一刻も早い支給の開始が必要である。

また、バングラデシュでは、学生が適当な就職先を見出すことは容易ではなく、過去の学生のドロップアウトの理由も、大半が就職に関するもの（就職口が見つかりと学業をやめてしまう）であると言われている。現在のところIPSA当局は学生の就職支援のために特段の活動を行っていないが、学生が学業に専念できるよう、在学生に対する奨学金の拡充とともに、卒業生に対する就職支援を業務として実施することが必要である。

IPSAの学生は、学内で拳銃発砲事件が発生するなど学生運動が激化し高等教育機関の荒廃が危ぶまれているバングラデシュにおいて、こうした運動の影響が及んでおらず、一般に勉学に熱心であると評価されている。これが教官に対するよい意味でのプレッシャーの役目を果たしており、現在、計画されている学生による教官の評価が実施されれば、さらに教官のモチベーションを高めることが期待される。優秀な学生の存在は、IPSAの自立発展性にとっても重要であり、学生に対する厚生施策の一層の充実が望まれる所以でもある。

なお、IPSAはダッカ市街から40キロほど離れたかなり隔絶した地に位置しており、このことは学生運動の影響を遠ざけるためには有効であると考えられたが、周辺には店舗や娯楽施設等が全く存在せず、学生の日常生活には非常に不便であることから、日用品を購入できる施設などを整備することが望まれる。

5-4 波及計画

1992年12月の巡回指導調査団の報告書では、IPSAプロジェクトにおける波及計画の定義とその活動内容が確立されていないことが今後の問題点として挙げられていた。その後、1993年4月から2ヵ月間アメリカ側の短期専門家Dr. W. Youngbergが招聘され、波及計画推進のための調査および提言を行った。同氏は、共通認識の上立ったIPSAとしての波及計画の定義（definition）がこれまで欠けていた事を指摘するとともに、IPSA教授陣との議論をもとにIPSA波及計画の目標をまとめ、具体的な活動内容を盛り込んだ実施計画案を提案した。同時に、波及計画が実施される為には、各学部の代表からなる委員会がIPSA内部に設置されることを強く提唱している。

前章でも述べたようにIPSAの波及活動が活性化しない根本的な原因は、教授陣の人数が足りないことに起因している。今後、波及計画の定義が明確化され委員会が組織されても、教授陣が

授業や研究に忙しい現状では、波及計画に関する活動は制約を受けざるを得ない。前述のDr. W. Youngbergも、その報告書の中で早急に人員が揃わない限り本格的な波及計画の実施は、難しいと言及している。(It is strongly recommended that a major commitment to an expanded Outreach and Extention program not be undertaken until additional faculty resources are available.)。この問題は波及計画の面だけでなくIPSAの活動全般に大きく影響を与えているのは言うまでもない。是非とも早急な解決が望まれる。

5-5 協力計画

1) 専門家の派遣

長期専門家は、カウンターパートへの単なる技術移転だけでなく、研究・教育に対する姿勢を身をもって伝える重要な役割があり、プロジェクト側もその点を指摘している。49名の教官枠のうちわずか22名で運営しているIPSAには若い教官が多く、研究や学生への指導経験も浅い。また、短期専門家の派遣時期は現地の希望時期に必ずしも一致していない。IPSAの持続発展性を考えると、280M/Mという観点だけではなくカウンターパートの育成という観点からできるだけ多くの長期専門家を派遣することが望まれる。

長期専門家を派遣する対応策として、国内支援委員会を組織する九州大学を中心とした各大学からのリクルートはもとより、広く他の大学からもリクルートできるシステムの確立が考えられる。また、文部省の他に農水省にも人材を積極的にリクルートするよう更に働きかける必要がある。いづれにせよ現在の情報を最大限に生かし長期専門家派遣の実現に努力すべきである。

専門家の派遣にかかる目標は1992年12月に280M/Mに修正されたばかりであり、1993年8月からプロジェクトが終了する1995年7月までの約1年10ヶ月で140M/M以上達成するよう最大限努力する必要がある。長期専門家の派遣人数増加については三国合同評価報告書でも報告されている。

2) 研修員の受け入れ

研修員の受け入れに関しては、特に問題はなく順調に進捗している。

教官リクルートが今後推進された場合、カウンターパートの研修の増大が考えられ、選抜された研修員を積極的に受け入れることが必要である。我が国としては研修員の受け入れをできる限り実施することがIPSAの持続発展性を向上させるために重要である。

3) 機材供与

現地業者の育成、IPSA側の機材管理システムの確立等プロジェクトには課題が多くこれらの踏点は三国合同評価報告書で指摘したところであるが、プロジェクトの持続発展性から考慮すると、機材の現地調達をできる限り推進していくことが重要である。そのためには、現地調達可能な機材の選定、現地の業者育成、精密機械維持管理システムの確立等が考えられる。プ

プロジェクトでは既に現地調達を推進している他、長期専門家の指導により現地業者が恒温機を作成して、実験に利用していた。

特に精密機器の維持管理は問題である。この問題の解決法としてプロジェクト実施期間中にできるだけ修理点検しておくことは必要であるが、プロジェクト終了後の維持管理の方法も早急に検討しておくことが重要である。現地の業者育成も重要であるが、短期間で育成することは困難であり、1995年7月のプロジェクト終了後の機材管理はバングラデシュ側に委ねられるものの、その修理・補修ができるように日本の業者との連絡・調整をサポートするシステムを構築することも一つの対応策である。

4) ローカルコスト

本来バングラデシュ政府が負担すべきローカルコストであるが、バングラデシュ側の負担にも限度があり、プロジェクト運営・実施に必要な経費は日本側が負担している。特に、設備の緊急補修、セミナー開催、マニュアル・教科書作成、他のプロジェクトとの技術交換等は、プロジェクト目標達成のために必要な活動であり、今後も実施されることが望まれる。

5) バングラデシュ側の投入

IPSA運営にかかるバングラデシュ側の投入は、人件費、建設・補修費等に当てられ、研究・教育費はわずか4.9%である。研究に基礎を置く教育を標榜している限り、研究・教育費への予算配分は相当額（50%程度）が必要であり、わずかな予算では、IPSAの自立発展は望めない。1992年11月のPP承認により、国家開発予算（ADP）がIPSAに配分されるようになったため、相当額の研究・教育費を配分することは容易のはずである。バングラデシュ側の判断を期待する。

また、PCPの承認により国家プロジェクトとなった結果、ECNECはプロジェクト終了時の1995年7月以降は現在の国家開発予算（ADP）から経常予算に移行するように勧告している。農業大臣も1994年から移行準備に取りかかるよう指示しており、プロジェクト側はバングラデシュ側が滞りなく経常予算に移行するよう注意する必要がある。

6) 三国協力

USAIDの1993年10月の協力終了に伴い、USAIDとIPSAの2国間で活動してきた項目については、バングラデシュ側が実施する旨が確認された。ただし、今後も協力が必要と判断された職員宿舎の建設、農業経済学科・コンピューターセンター・科目制カリキュラム等への短期専門家派遣については三国合同評価報告書で勧告しており、USAIDの善処が期待される。職員宿舎に関しては1993年中に着工する見込みである。

日本側の活動については、今までの活動範囲を広げずに1995年のプロジェクト終了に向けて活動する旨が確認された。1992年12月に改訂されたTSIに基づきプロジェクト終了に向けて活動することが重要である。

また、上位目標・プロジェクト目標等が書類により異なる点は認識され、三国合同評価報告

書の教訓にも今後新たに三国でプロジェクトを開始する場合、同一書類に署名するよう指摘している。1994年度の日本側の終了時評価の際、R/D及びPPが公式書類として「バ」側は要求すると推測されるが、2国間で正式に署名された書類はR/Dであるため、あくまでもR/Dに基づき評価することを「バ」側に事前から説明しておくべきである。

6. 評価結果総括

6-1 評価の総括

IPSAプロジェクト運営の現状を調査し、管理・運営、研究・教育、波及に分けて下記のように評価した。

IPSAプロジェクトの進行度はフェイズⅠ、フェイズⅡを通して（1985年7月～1993年8月現在）見た場合、必ずしも順調に進行していたとは言い難い。

何故ならば、プロジェクトをスタートさせた時点で本プロジェクトの基幹をなす大学院設置法とも言うべき、『IPSA Ordinance/Act』が制定されていないこと、また、両フェイズとも国家プロジェクトとしての政府のプロジェクト認定書とも言えるPCP（Project Concept Paper、バ国政府と農業省間の合意）、これを更にブレイク・ダウンさせたPP（Project Proforma、バ国農業省とIPSAプロジェクト間の合意）も得られないままプロジェクトを開始した為に、プロジェクトを運営しながら上記の法的根拠を整備しなければならなかったと言うハンディがあり、プロジェクト側はかなりの精力がこれらの制定に割かれた。

その上、プロジェクト運営の中心となる行政や研究面は農業省の管轄下、教育面はUGC（University Grants Commission 教育省所属）による統括下にあると言う、IPSA独特の極めて不安定なプロジェクト運営を強いられている。

更に、当時のIPSA学長のIPSAプロジェクトに対する無気力さとフェイズⅠの末期に持ち上がったIPSAの農業省から教育省への移管問題によるIPSA教官の動揺、エルシャド政権からカルダ・ジア政権への政権交代による政府内部の混乱と動揺も加わり、新カリキュラム（コース・クレジット・システム）のモデルをフェイズⅠで準備しながら、実際に新しい教育システムをIPSAに導入したのはフェイズⅡが開始されて1年後、つまり、1991年8月であった。

この事実からも明らかなように、本プロジェクトの進行は1987～1991年代に生じた上述のIPSAを取り巻く社会状況に大きな影響を受けた。

仮に、プロジェクト全体の流れを『大学院大学の教育システムの確立とこれに立脚した人造り』にあるとするならば、ある人物が修士課程（2年間）に入学し、これを終了、博士課程に入学して、3ヶ年でコースを終了するのを1つの行程と見れば、常識的には、1行程は5～6年要すると考えられる。

若し、理想的なプロジェクト運営がなされたとして、フェイズⅠの3年目、すなわち、1988年に新カリキュラムが導入されていれば、フェイズⅠの終了時（1990）には修士学生が誕生しており、フェイズⅡの3年目、1993年には博士課程を終了した学生が誕生していた計算となる。このような単純な算術が正しいか否かの論議を別とすれば、本プロジェクトの進行は最低2年立ち遅れていると言える。

他方、1991年8月にバ国の農業高等教育（IPSA）に新教育システム（コース・クレジット・シ

システム)を導入してからの教育面でのIPSAの進展はすでに述べたように目を見張るものがあると高く評価出来る。

残念なことに、修士課程2年、博士課程の3年間と言う新システムの教育期間はどんなにプロジェクトの遅れを他の部分でカバーして取り戻そうとしても、取り戻すことは出来ない。この点が他のJICAプロジェクトと異なり、教育に必要な時間の壁は越えることが出来ない。

以上の理由から、教育面では本プロジェクトは当初予定より、少なくとも2年以上は遅れていると判断される。

一般的に、開発途上国におけるプロジェクトの進行の度合いはその国の経済発展に大きく影響される。この事実は東南アジア諸国(マレーシア、タイ、インドネシアなどの発展中進国)におけるわが国のプロジェクトの進展度と比較してみれば明らかなことである。

このような視点から見れば、バ国(LLDC)におけるプロジェクトの多少の遅れは致し方ないのかも知れない。

その上、プロジェクトの進行度に密接に関連するのはプロジェクトに関与する相手国のキーパーソンの資質の問題がある。この点でも本プロジェクトは不幸であったと言える。

要するに、本プロジェクトの進行は行政・研究・波及などの面でそれぞれ多少の遅れが見られるものの、全体としてはスムーズに流れていると評価する。

後述するように、現在のIPSAが直面している諸問題は、主として、バ国の社会経済的な理由に起因する部分が多い。そこで、これらの問題を乗り越えて、今後、プロジェクトの当事者が更なる努力を払い、今回、指摘した諸問題を解決して頂きたいと言う意味で、総括及び提言の内容を、特に、プロジェクトの問題点に絞って記載した。

a) 管理運営

IPSAの管理運営は、MOAの習わしと思われるが、組織の長に集中した権力によって行われている。いかに長が有能でも、予算、人事、その他、運営に関するそれぞれの事項(図書館運営、農場利用、入学生選抜、奨学金問題、職員更生問題など)を取り扱うためには有能な事務職員のサポートが必要である。にもかかわらず、副学長など重要なポストを始め、多くの職員の席を欠員のまま放置している。これらは急いで補充されなければならない。またIPSAを機能的に運営してゆくためには各種委員会を組織し、より開かれた審議により、客観的に納得できる管理運営が行われなければならないが、この点は少しずつ努力の跡がみられる。

IPSAオーディナンス(Ordinance)が1993年末までに制定されるものと期待される(農業大臣、農業省次官談)ので、それを機会に、管理運営に関する組織と方法について再検討する必要がある。オーディナンスはMOAとMOLの協議によって現在ベンガル語で作成中であるが、その内容について至急に検討する必要がある。

図書館、農場の管理運営についても問題が多い。図書館には図書購入用の予算を増額し、図書の実を計ると共に、職員の増員とコンピューター化によってサービスを充実し、利用効率

の向上を計らなければならない。農場では、未だに解決されずに残されている私有地の問題を急いで解決し、農場の周囲にフェンスをめぐらすことによって、農場の設備や実験用の植物を盗難から守らなければならない。保安要員による夜間巡回を行う必要もあろう。

b) 教育・研究

教育については、1991年8月から新カリキュラムが取り入れられ、教官による熱心な講義が行われている。しかし、教官数は定員の半数にも足りない（定員49中27が空席）ため、多くの講義をBARI, BRRI, BAU及びDUなどからの非常勤講師に頼っているのが現状である。教官は講義に追われ、研究に没頭する余裕がない。学術雑誌へのレポートは多いが、これらの内のかんりのものは留学先での研究成果、長期または短期専門家との共同研究、または近隣研究機関との共同研究で得られたものである。教官の空席が速やかに充足され、それぞれの教官が研究に熱中できるような環境が必要である。Research-based educationを標榜しているからには研究の活性化はIPSAにとって欠かすことができない。現在までにJICAから購送された研究用の機器も研究の活性化があってこそ役立つものである。長期専門家の派遣が研究の活性化を促すことは明らかであり、我が国としてはそのための格段の努力が必要である。

c) 波及

研究の成果として実用化できる可能性のある園芸作物の新品種が育成されている。これらは我が国に留学中に行った共同研究の成果が基礎になったものであり、このような成果が、今後IPSA独自の研究から続出することが望まれる。このような目先の波及も現在のバ国にとっては重要であり、研究者の励みになるが、大学院大学の真の波及は、将来育つ研究者の数と質にある。

6-2 提言

IPSAプロジェクトの終了を2年後にひかえた現在でも、GOB (MOA) 及びIPSAには早急に実施しなければならないことが余りにも多い。今後、我が国としては、下記の事項がいかに進展するかを見守る必要がある。

a) IPSA オーディナンスの制定

現在、IPSAはIPSA オーディナンスの制定が遅れているため、独自に修士号、博士号の称号を出すことができない。従って、1993年に修士課程を終了した28人も未だに称号は贈られていない。このような不合理を解消するためにはGOBがIPSAのためのオーディナンスを制定しなければならない。現在、その為の申請書がMOAからMOLに送られており、1993年中には国会で批准される見通しである。この内容を至急に検討すると共に、この実現に向けてあらゆる努力が必要である。

b) 教官のリクルート

IPSAの教官定員は、現在、49名である。そのうち27名が空席のままであることは前述のとおり

りである。この欠員は研究教育の面のみならず、IPSA運営のあらゆる面で大きなマイナスである。教官のリクルートは現在進行中である。今までの例ではほとんど全ての採用者が内部から昇格しており、選考が公正に行われているものかどうか疑われる。優れた教官（教育と同時に研究能力の高い教官）を広く国の内外から求め、採用することはIPSAの発展につながる重要な課題である。

c) IPSA 管理運営機構の改善

IPSAにはその管理運営に必要な中堅事務職員が少ない。これを採用してIPSAの事務（予算、人事、入試、図書、農場、教官の業績、学科の活動など）に関する情報を管理し、IPSAの能率的な運営に役立てることが必要である。このためにはコンピューターを利用するのが最も賢明である。

IPSAはMOAの一組織であるため、その管理運営機構はMOAの規則と慣習にしたがっている。全ての予算は組織の長が掌握し、いかに少額でもそのサインがなければ支出することはできない。しかも、各学科への割り当ては全くゼロである。これでは各学科は年間の研究計画も立てられず、また実験上消耗品などが緊急に必要な場合でも自由に購入するわけにいかない。

このような管理運営の方法は大学には全くふさわしくない。少なくとも年度当初から予算項目にしたがって割り当て、共通費を除いた一定の額は各学科に一定の基準で配当し、教育研究に自由に使用できるように改められなければならない。ちなみに、教育省に属する大学では予算の学科への配当は行われている。オーディナンス制定後早急に改善されることが必要である。

d) IPSA 予算の増額

IPSA予算のうち主要な部分（建築、施設、機器購入修理、研修員派遣、専門家受け入れなど）はJICAとUSAIDからの援助に頼ってきたが、バングラデシュ側も年次開発計画（ADP）からの配当額を年々増加する傾向にある。ところが、前述のように、その中に占める研究教育費の割合は極めて少なく、教育研究機関としては全く異常である。予算の大部分は研究教育のために支出されるように改善されなければならない。

また、1993年10月のUSAID撤退後からは、今までUSAIDに頼っていた図書購入費などはGOBの予算で賄う努力が必要であり、さらに、1995年のプロジェクト終了に向けて今から予算的な準備を整える必要がある。

e) 農場管理

IPSAの農場管理上重大な支障となっている私有地はIPSA設立当初からの懸案事項であったが、未だに解決していない。この買上と、盗難防止のためのフェンスの整備は早急に必要である。農場の運営に関しても問題が多い。農場が必要な学科はそれぞれ一定面積を確保し、学科の責任において管理し、利用している。従って、IPSA全体の農場利用計画が立てられない。農場と各学科とは密接な関係にあると同時に、農場の主体性も必要である。これらの問題を解

決するためには関係学科から選出される委員で農場委員会を組織することが望まれる。

f) 図書館、学生実験室、農場実験室の建設

我が国の無償協力資金によってフェーズⅡで計画されたこれらの建築物は、いずれも立派に完成し、供用されている。ただ現在のところ、前述のように、図書の数少なく、サービスが不十分なために、学生によって十分に利用されているとは言えない。職員の補充と事務のコンピューター化が急がれる。USAID (OSU) からの短期専門家が8月下旬に着任しているので、図書館の管理運営も軌道に乗るものと期待される。

学生実験室、農場実験室も完成し、機能している。

g) 研究用機器の維持管理

プロジェクト開始以来、JICAからIPSAに購送された研究用の機器は莫大な量に上る。これらの機器が十分に利用されているとは言えない。その原因は教官の不足による。一刻も早く教官の空席を補充することが重要である。そして、研究が活性化すれば自ずから機器の利用効率は高まるはずである。

これらの機器の中には複雑な電子部品を内蔵し、一度壊れるとバ国では修理できないものが多い。この場合、メーカーに診断を依頼し、部品を取り寄せて交換しなければならない場合もあろう。メーカーの支店がダッカにあればこのようにして修理することも可能であろうが、現実には不可能である。特に重要な機器の場合には専門家として我が国から技術者が派遣されているが、これが可能なのはプロジェクトの続く期間だけであろう。

この研究用機器の維持管理の問題は、特に1995年プロジェクト終了以後、最重要課題となる可能性があり、今から対策を立てておく必要がある。

基本的には次のような対策が考えられる。

- (1) GOBからの十分な修理予算の確保、そのためには、将来、高価な研究用機器はBARI, BRRI, その他の研究機関と共同利用することによって国からの特殊予算を獲得する。
- (2) 専門家からあらゆる機会に機器の使用法について特訓を受ける。
いかに複雑な機器でも、使用法を誤らなければ故障はほとんど起こらないはずである。
- (3) 主な機器については責任者を定め、使用簿を整備することなどによって管理を厳重に行う。
但し、これによって使用を制限するようなことになってはならない。
- (4) 電子部品の多い機器の購送を今後できるだけ差し控える。

h) 共同研究の推進

IPSAの近くにはバ国の農業研究の中心的組織であるBARI, BRRIがある。そこでは多くの研究者が主に実用的な研究課題に取り組んでいる。また、これらの研究機関からは多数の研究者が非常勤講師としてIPSAへ講義に派遣されている。従って、IPSAの機器を利用して共同研究することは合理的である。現にIPSAとこれらの研究機関の間には協定が交わされていて共同研究が行われている。基礎研究と実用研究との間はこれらの共同研究によって密接に結び付

き、波及の成果もあがるはずである。また、これによって、IPSAの研究用機器もさらに有効に利用できるものと期待される。この種の共同研究はさらに国際的にも可能であり、現にエジプト及びケニアの大学との間に協定が結ばれている。

i) 長期専門家派遣の必要性

この問題はプロジェクト発足当初からの問題であり、依然として困難な状態にあるが、フェーズⅡになって若干の改善がみられる。Agronomy, Entomologyの両学科に長期専門家が着任し、さらに農場管理にも送られている。IPSAの各学科の研究に方向性を与え、研究成果を得るためには長期の専門家が必要である。プロジェクト終了まで、なるべく多数の長期専門家を派遣できるよう、そのための日本側の一層の努力が望まれる。

j) 基礎教科目の充実

科学的な基礎知識と基礎的実験技術の向上を計るため、IPSA内に共通基礎学科を置き、科学、物理学、生物学、分子遺伝学などの基礎分野の教授と実験方法の指導が望まれる。

k) 奨学金、研究助成金の増額

IPSAにはIn-serviceとFreshに分けられる2種類の学生がおり、これら両者の間には経済的にかなりの差があることは前述のとおりである。経済的に恵まれないFreshな学生の割合が増加する傾向にあり、奨学金は少なくとも4～5倍に増額することが望まれる。さらに、研究助成の制度も創設し、優れた研究には国の助成金が与えられるべきである。このようにして優れた教官、優秀な学生を確保し育てることはIPSA発展のための必要条件である。

l) 教官の評価

教官は常に自ら最善を尽くし、責任を果たすように努力することが必要であるが、教官の資質向上のためには教官の評価を行うのが望ましい。それには下記の方法が考えられる。

- (1) 自己評価（学術論文の数と掲載雑誌、社会活動）
- (2) DirectorとDeanのそれぞれによる学内における活性評価
- (3) 学生による教授内容の評価

m) USAIDの撤退に伴う対応策

USAIDは1986年からIPSAプロジェクトに参加し、いわゆる三国共同プロジェクトの1翼を分担してきたが、1993年10月で撤退する。これに伴い本評価チームは次の事項を要望した。USAIDはこれらに対し善処することを表明した。

- (1) PL480資金による職員宿舎の建設の推進
- (2) 農業経済学科に対する短期専門家の派遣
- (3) コンピューター利用システムの完成と利用のための短期専門家の派遣
- (4) カリキュラム実施状況の調査と見直しのための短期専門家の派遣
- (5) IPSAの運営、教育、研究などに対するOSUの協力
- (6) 今後のIPSAに対する支援、IPSAとOSUとの協力関係の維持

n) 学科増設案

IPSAは現在11学科からなっているが、多くの欠員を抱え、内容的には不安定で、十分に機能しているとは思われない。にもかかわらず、ECNECはIPSAにAnimal Science, Agroforestry、およびFisheryの3学科の増設をPCPにより承認した。このことにより、遠からず具体化してくることが考えられる。万一对応の必要性が生じた場合にはIPSAにおける今までの経験とIPSAの現状が貴重な判断材料となろう。

これらの提言は、三国評価の結果としてバ国に報告済みである。今後、我が国としては、これらがバ国によっていかに実行されるかを注視する必要がある。特にオーディナンスの制定と、それに続く管理運営組織の改善及び教官のリクルートによる大幅な増員が重要である。残された2年のプロジェクト期間中に、我が国としてはあらゆる面で最善を尽くすよう努力しなければならない。

6-3 教訓

a) 事前調査の重要性と計画の見直し

IPSAプロジェクトはバ国に大学院大学を設立して運営するという大事業である。それも、高等学校の移転問題に端を発し、2転3転しながらたどり着いた大学院計画である。1985年以来、JICAとUSAIDは多額の資金と労力を投入しながら8年間経過した。九州大学と各支援大学、および、OSUも多くのエネルギーを使った。その結果、IPSAの設備、備品は着実に増加し、教官数も増えつつある。しかし、大学院としての制度・運営上には依然として未解決の問題があり、プロジェクトが終了する2年後が心配である。このように遅滞している根本的な原因は主にバ国の社会経済的事情（政権の交代など）とそれに対する判断の甘さにあったものと考えられる。

b) 三国間共同プロジェクトにおける分担と一元化

本プロジェクトは三国間共同プロジェクトとして実施されてきたが、三国間に共通の協定書はなく、二国間の協定により実施されてきた。従って、USAIDはGOBとの二国間だけで協定を締結することによりたやすく撤退することになった。USAIDはバ国との協定内容を完了したための行動というが、客観的には必ずしもそのようには見えない。USAIDが担当していた分野はカリキュラムを除いて何ひとつ完了しているとは思えない。しかし、我が国からクレームを付けることにも無理がある。一つのプロジェクトに多国が共同して関係する場合、プロジェクト全体の目標と同時にそれぞれの分担部分の目標と責任についてもあらかじめ互いに合意しておくことが重要である。

c) 専門家派遣の可能性に関する事前調査

IPSAプロジェクトにおいては、長期専門家の派遣が困難であった。そもそも我が国の大学にはサバーチカルの制度はなく、講座制であるところが多いため、教授、助教授が長く教室を

空けて外国に滞在することには無理がある。従って、この種のプロジェクトを始める場合には、人員派遣の可能性を十分に事前調査することが重要である。また、途上国の高等教育問題でわが国（JICA）がプロジェクトを計画するためには、まずわが国の大学組織の改変（大学の講座制の改廃、または国際対応の学科や研究科などの新設など）が必要であり、ゆとりのある大学、または国際専門の組織がわが国の大学内にできてはじめて無理なく長期専門家の派遣が可能となろう。それまでは、留学生の受入れに重点を置いて途上国の高等教育問題に対応せざるを得ないであろう。

附 属 资 料

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, crop management						
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 productivities						
-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						
b) Plant tissue culture						
c) Others :						
-Hybrid varieties (onion, radish)						
-Eggplant: Disease and insect resistance						

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Categories	1990	1991	1992	1993	1994	1995
-Wheat:Nutritional improvement						
3- Cytogenetical analysis of some crop plant						
a) Some cytogenetical observation of remote hybrids						
4- Mutation breeding						
a) Rice						
Development of mutant lines using physical and chemical mutagens						
b) Others						
-Development of mutant lines using physical and chemical mutagens (Wheat, Mungbean)						
5- Improvement of dioecios and pulse crop						
6- Variety development of horticultural plants						
a) Vegetables						
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 MLOs diseases						
3- Fungal Diseases						

llg *[Signature]*

Categories	1990	1991	1992	1993	1994	1995
a) Isolation and identification of major soil-born plant pathogens						
b) Isolation and identification of antagonistic micro-organisms from Bangladesh soils						
c) Evaluation of antagonistic micro-organisms against major soil-born pathogens for bio-control						
d) Ecological studies on soil-born plant pathogens						
4- Plant Bacteriology						
a) Survey and monitoring of bacterial diseases of major crops						
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 rice) for IPSA and related soils						
a) Water requirement of crops by field experiment						
b) 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)						

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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 and management						
b) Vegetables						
-Improvement and development of vegetable varieties						
-Management						
-Seed production technology						
c) Ornamental plants						
-Production						
3- Biotechnology in horticultural plant						
a) Micropropagation in vegetables, ornamentals and tropical fruits						
b) Virus free plant in vegetables,						

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Categories	1990	1991	1992	1993	1994	1995
4- Taxonomy, classification and variety identification of horticulture plants in Bangladesh						
a) Chemotaxonomy of horticultural plants						
- Classification and variety identification by isozyme analysis in tropical fruits, vegetables						
5- Use of growth regulators in horticultural plants						
a) Flowering						
b) Fruit set						
6) Entomology						
1- Ecological studies						
a) Insect pests						
- Ecological and integrated control studies on borers 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						

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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 of endosperm						
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						
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						

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Categories	1990	1991	1992	1993	1994	1995
<p>2. Academic Program To support the following activities of IPISA teaching staff through giving technical advice/guidance.</p> <p>(1) Improvement of the teaching and advising methods for student research and experimental activities in M.Sc. or Ph.D program</p> <p>(2) Preparation of teaching materials including writing the textbook</p> <p>(3) Lectures of IPISA teaching staff</p> <p>(4) Arrangement of curriculum, especially, related to experimental activities</p> <p>(5) Others a) Improvement of library service b) Improvement of computer center</p>						
<p>3. Outreach Program To support the following activities of IPISA teaching staff through giving technical advice/guidance.</p> <p>(1) training of agricultural researchers, extension personnel and teaching staff of agricultural institutions</p> <p>(2) Seminars for agricultural researchers and IPISA students, etc.</p> <p>(3) Seminars and field days for disseminating the results of the Project to agricultural researchers, extension personnel and teaching staff of agricultural institutions</p>						

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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				—	—	—
-Others				—	—	—
	[one to three Expert (s) per year except for Team Leader and Coordinator]					
[Short-term]						
-Agronomy	—	—	—	—	—	—
-Genetics and Plant Breeding	—	—	—	—	—	—
-Plant Pathology	—	—	—	—	—	—
-Soil Science	—	—	—	—	—	—
-Horticulture	—	—	—	—	—	—
-Entomology	—	—	—	—	—	—
-Crop Botany		—	—	—	—	—
-Farm Management			—	—	—	—
-Maintenance of Equipment	—	—	—	—	—	—
-Others				—	—	—
2. Dispatch of Team						
-Consultation Survey Team	—	—	—	—	—	—
-Technical Guidance Team				—	—	—
-Interim Evaluation Team			—	—	—	—
-Evaluation Team					—	—
3. Training of Counterparts Personnel in Japan						
	(Approximately three (3) personnels per year)					
4. Provision of Machinery and Equipment	—	—	—	—	—	—

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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 Equipment						
-Others						
2. Administrative personnel						
3. Land and Buildings						
4. Expenses for implementation of the Project						

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附属資料 2

三国合同評価報告書 (英文)

JOINT TRIPARTITE EVALUATION
OF
INSTITUTE OF POSTGRADUATE STUDIES IN AGRICULTURE PROJECT
IN BANGLADESH

A Project by the Government of Bangladesh
in Cooperation with
The Government of Japan and
The Government of the United States of America

September 1, 1993

JOINT TRIPARTITE EVALUATION
OF
INSTITUTE OF POSTGRADUATE STUDIES IN AGRICULTURE PROJECT
IN BANGLADESH

Report of Evaluation Team
September 1, 1993

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

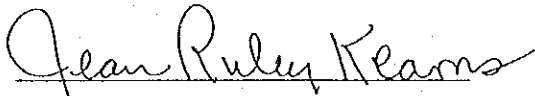
Submitted to Relevant Agencies of :

the GOVERNMENT OF JAPAN,
the GOVERNMENT OF THE UNITED STATES OF AMERICA, and
the GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH.

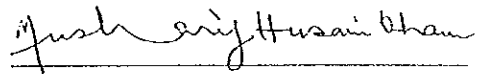
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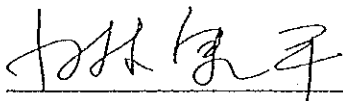
Dr. Satoshi Wakimoto, Team Leader



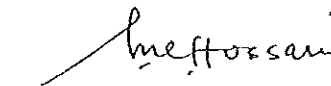
Dr. Jean Ruley Kearns



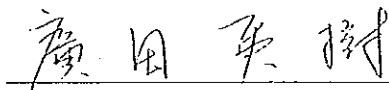
Professor, M.H. Khan



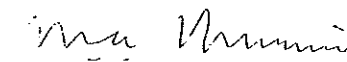
Dr. Kouhei Kobayashi



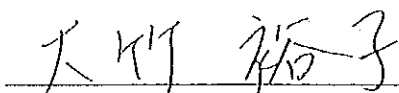
Mr. Md Enayet Hossain



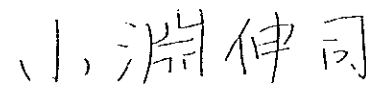
Mr. Hideki Hirota



Mr. M. Abdul Mumin



Ms. Yuko Otake



Mr. Shinji Obuchi

ACKNOWLEDGEMENTS

During the preparation of this report, the Tripartite Evaluation Team received excellent cooperation, support and assistance from many individuals. The report itself required a structure to accommodate the needs of the respective international donor agencies as well as that of Government of Bangladesh. In this sense this report deviates from the usual evaluation report in structure and concept and content usually required in a bilateral situation.

It is our distinct pleasure to record our grateful appreciation to the following persons who constituted a working group and produced the Working Paper for the team: Dr. M. Sugiura, Team Leader, JICA; Dr. R.E. Witters, Curriculum and Research Advisor USAID/OSU; Mr. T. Fujii, Coordinator, JICA; and Dr. E. Ahsan, Rector, IPSA.

This evaluation could not have been accomplished in the time available without having the Working Paper and file of documents relative to the project. It synthesized for the team the historical record relating to the evaluation of the IPSA project and also provided in detail the progress and constraints faced in the IPSA project. We are grateful to all who participated in preparing report.

We wish to express special appreciation and gratitude to the IPSA administration, Faculty, staff and students who shared their valuable time and thoughts with us. We also appreciate the work of the JICA staff.

We express our thanks to the many officials at the several National Research Institutes, the Bangladesh Agriculture Research Council, University Grants Commission, and the executives within the Ministry of Agriculture, Planning Commission and other GOB offices, officials of USAID, the Embassy of the Government of Japan, and others, with whom we had such pleasant and helpful interactions. They were most gracious and freely shared their insights with us and we thank them.

Further, the team wishes to especially recognize the courtesies extended and the technical guidance given to the team by Dr. Sugiura and Dr. Witters. Without their assistance, preparation of this report would have been very difficult.

LIST OF ACRONYMS AND ABBREVIATIONS

ADP	Annual Development Plan
BADC	Bangladesh Agricultural Development Corporation
BAI	Bangladesh Agricultural Institute
BARC	Bangladesh Agricultural Research Council
BARI	Bangladesh Agricultural Research Institute
BRRI	Bangladesh Rice Research Institute
BINA	Bangladesh Institute of Nuclear Agriculture
BAU	Bangladesh Agricultural University
BCAS	Bangladesh College of Agricultural Science
CDST	Customs Duty and Sales Tax
CERDI	Central Extension and Resource Development Institute
C/P (s)	Counterpart (s)
DAE	Department of Agricultural Extension
DG	Director General (BARI, BRRI)
DPEC	Departmental Project Evaluation Committee
DU	Dhaka University
ECNEC	Executive Committee of the National Economic Council
ERD	Economic Relations Division
GOB	Government of Bangladesh
GOJ	Government of Japan
IPSA	Institute of Postgraduate Studies in Agriculture
IMED	Implementation, Monitoring, and Evaluation Division
JICA	Japan International Cooperation Agency
M/M	Man/Month
MOA	Ministry of Agriculture
MOU	Memorandum of Understanding
MOE	Ministry of Education
NBR	National Board of Revenue
OSU	Oregon State University
PC	Planning Commission
PEC	Project Evaluation Committee
PIL	Project Implementation Letter
PKC	Patuakhali Krishi College
PCP	Project Concept Paper
PP	Project Proforma
R/D	Record of Discussion
TK	Bangladesh Taka
TSI	Tentative Schedule of Implementation
UGC	University Grants Commission
USA	United States of America
USAID	United States Agency for International Development
USD	United States Dollar

Contents

1. Table of Contents	
2. Executive Summary-----	1
3. Purpose of the Evaluation-----	2
4. Team Composition-----	2
5. Evaluation Methodology-----	3
6. Background of IPSA Project	
6.1. Background of IPSA Project-----	5
6.2. Goal and Objectives-----	8
6.3. Strategies Followed for Accomplishment of the Objectives (1990 -1995)-----	12
7. Input Support Activities	
7.1. Dispatching of Experts-----	14
7.2. Faculty and Staff Training-----	17
7.3. Dispatching of Special Teams-----	19
7.4. Procurement of Machinery and Equipment-----	21
7.5. Physical Infrastructure and Campus-----	22
7.6. The Administration Structure-----	23
7.7. Staffing (Faculty and Staff)-----	26
7.8. IPSA Project Budget-----	30
7.9. Project Supporting Bodies in Japan and the USA-----	30
7.10. Financial Support for IPSA Students-----	32
7.11. GOB budget for IPSA Project-----	33
8. Program Activities and Accomplishments	
8.1. Institutional Development-----	35
8.2. Research Program-----	39
8.3. Academic Program-----	46
8.4. Outreach Program-----	55
9. Sustainability of IPSA and its End-of-Project Status-----	57
10. Constraints to Project Implementation and Attainment of Goals-----	60
11. Tripartite Relationships and Effectiveness-----	64
12. Conclusions and Recommendations	
12.1. Conclusions-----	66
12.2. Recommendations-----	67
13. Lessons Learned-----	72
14. Appendices	
14.1. Evaluation Scope of Work	
14.2. Logical Framework	
14.3. Reference Documents For Evaluation Report	

14.4. List of Individuals and Agencies Met

14.5. Comparison of Previous Evaluations and Present Project Status

2.0 EXECUTIVE SUMMARY

The Institute of Postgraduate Studies in Agriculture (IPSA) was established in 1983 charged to conduct post-graduate training at the masters and doctoral levels as well as research and outreach programs. The first group of students in the masters program was admitted in June 1984. Technical cooperation between the GOB and Japan began in 1985 and the United States joined the project in 1986. Funding from Japan was provided via the Japan International Cooperation Agency and United States funding was provided by the United States Agency for International Development through a contract with Oregon State University. Near the end of Phase I a joint tripartite evaluation was held and on June 14, 1990 JICA agreed to continue their involvement in the project until July 3, 1995 and on November 6, 1991 USAID agreed to continue project support until October 1993. Thus, the present evaluation represents the final project evaluation for USAID involvement and a mid-term or interim evaluation for JICA support.

The Joint Tripartite Evaluation Team was composed of five JICA representatives, three GOB representatives and one USAID/OSU representative. The objectives of the evaluation were to assess the overall performance and impact of the project to date with emphasis on Phase II, to recommend measures to be taken by the contributing governments, and to provide feedback of the evaluation results to assist the project in reaching stated objectives and goals. To achieve these goals, the Evaluation Team conducted interviews with a wide range of individuals and agencies, reviewed a significant number of documents, and discussed issues with relevant persons/agencies.

Generally, the status of project activities is very good relative to donor and GOB inputs and impact. However, the central critical issue relates to the lack of an enacted Ordinance for the IPSA. Without an Ordinance the Institute cannot issue degrees, construct an adequate administration/management unit, or initiate necessary changes for sustainability. Second in importance to the enactment of the Ordinance is the necessity to increase the level of IPSA manpower (27 vacant positions now exist in the faculty). These two topics (Ordinance and manpower) were part of the first Tripartite Evaluation recommendations and are still pending. Other recommendations of the current Evaluation Team relates to continued GOB support for the sustainability of IPSA, the need for USAID to continue involvement in the project with limited but specific inputs, the desirability (in terms of sustainability) of the US and Japanese universities to continue professional linkages with IPSA, and specific programic issues.

The key lessons learned centered around the positive impact on the IPSA program due to the cooperative working relationship among IPSA, the United States/OSU technical assistance personnel and the Japanese experts. The culturally and socially sensitive input from IPSA combined with the technical knowledge of the other two partners resulted in forward progress for the project. The technical expertise of Japan and the US did not overlap and thus the division of labor created a workable climate which benefited IPSA.

3. PURPOSES OF THE EVALUATION

The purposes of the evaluation were as follows:

- 1) The Second Tripartite Evaluation is a joint effort to produce an interim evaluation of JICA project activities and a final evaluation with the USAID participation.
- 2) To assess the overall performance and impact of the Project to date.
- 3) To recommend measures to be taken by the three Governments concerning pending issues and major problems encountered.
- 4) To provide feedback for efficient implementation to attain the goals of the Project.

4. TEAM COMPOSITION

The evaluation team consisted of representatives from the JICA, USAID and the GOB.

1) The Team Leader and Members from JICA:

- (1) Prof. Dr. Satoshi Wakimoto Team Leader, (Institutional Development)
Tokyo University of Agriculture,
Department of Agriculture,
Professor emeritus, Kyushu University.
- (2) Prof. Dr. Kouhei Kobayashi (Research Program)
Department of Agricultural Economics, Faculty
of Agriculture, Kyushu University.
- (3) Mr. Hideki Hirota (Academic Program)
Senior Specialist, the Minister's Secretariat,
Policy Planning and Coordination Division,
Ministry of Education, Science and Culture.
- (4) Ms. Youko Ohtake (Outreach Program)
Assistant Director, Department of Planning and
Program, Foundation for Advanced Studies on
International Development.
- (5) Mr. Shinji Obuchi (Cooperation Policy/Planning)
Staff, Agricultural Technical Cooperation
Division, Agricultural Development Cooperation
Department, Japan International Cooperation
Agency (JICA).

2) The Member from USAID:

- Prof. Dr. Jean Kearns University of Arizona,
Deputy Executive Director, The Consortium for
International Development.

3) The Members from The Government of Bangladesh:

- (1) Prof. M.H. Khan Member, University Grants Commission.
- (2) Mr. Md. Enayet Hossain Joint Chief (Planning Wing), Ministry of
Agriculture.
- (3) Mr. Md. Abdul Mumin Joint Chief, Crop Wing, Agriculture Division,
Planning Commission, Ministry of Planning.

5.0 EVALUATION METHODOLOGY

The Joint Tripartite Evaluation actually served two purposes. It was the mid-term or interim evaluation of the JICA funded part of the project and it was the final evaluation of the USAID funded part of the project. The key difference in the two purposes was timing but the findings were based on the same conditions and the findings were the same.

In order to ascertain the status of the project, the evaluation team utilized several procedures. The most time consuming and probably the most productive procedure consisted of interviews with individuals and groups who were familiar with the work of IPSA.

The interview listing was as follows:

- The Minister of Agriculture
- The Secretary of the Ministry of Agriculture
- Institute of Postgraduate Studies in Agriculture
(administration, faculty, staff, students)
- Bangladesh Rice Research Institute
- Bangladesh Agricultural Research Institute
- University Grants Commission
- Bangladesh Agricultural Research Council
- Bangladesh Agricultural University
- Planning Commission
- Economic Relations Division of the Ministry of Finance
- Japan International Cooperation Agency (resident staff)
- United States Agency for International Development (resident staff)
- Oregon State University Experts (long and short term)
- Japan International Cooperation Agency Experts (long term)

During these interviews the team received information from the interviewees relative to GOB issues specifically concerning IPSA as well as issues related to the internal work of the institution. Some of the interviews were conducted with the entire team while other discussions took place between individuals or with a part of the whole team. Discussions were recorded and the team reviewed the information periodically.

In addition to the interviews, the evaluation team reviewed a significant amount of documents. A sample listing of some of the reviewed documents is as follows:

- IPSA Catalogue, 1992-1993
- IPSA Annual Research Review
- Bangladesh Agricultural Research Information System, IPSA
Research Experiments for 1993-94
- Joint Tripartite Evaluation on IPSA Project, 1989
- Record of Discussions Between GOB and JICA, June 14, 1990
- Memorandum of Understanding Between JICA/DHAKA and
USAID/DHAKA, June 1990
- Minutes of Discussions, JICA Consultation Survey Team,
October 1990
- Minutes of Coordination Committee, July 1992, December 1992
- Curriculum Workshop Recommendations, Prof. Eisgruber, 1992
- Memorandum of Understanding, BARI, BRRI, BAU, JKUCAT

Information Management Systems Information Sheet
Plan of Work, Prof. Witters
Listing of Long and Short Term Experts
Listing of Participant Trainees in Japan and USA
Listing of Inventory Procured by USAID or JICA
Evaluation Report, Prof. Eisgruber
Listing of Books and Journals Provided by USAID or JICA
Listing of IPSA Publications

A Logical Framework was prepared and utilized by the evaluation team as an overall "map" of the project. Entries in the logframe were discussed in reference to the information acquired in the interviews and in the document review process.

Tripartite Evaluation Team meetings were held frequently and the amount of time devoted to deliberations was considerable. The basic pattern of work was for the individual members to prepare a draft of a specific part of the report and then bring that draft to the entire team to discuss and review. The draft was then revised by the responsible team member and finalized.

The Tripartite Evaluation Team concluded that within the time constraints of the evaluation period that they were satisfied that every effort was made to accurately ascertain the exact status of IPSA at this point in time.

6.0 BACKGROUND OF IPSA PROJECT

6.1 Background of IPSA Project

(1) Establishment of IPSA

The Government of Bangladesh (GOB) attaches importance to the development of the agricultural sector to increase productivity. As a result, agricultural education, research, and extension organizations have undergone several reforms in order to adapt to advances in science and technology. In line with this agricultural development policy, the GOB recognized the need for highly skilled technical manpower, and decided to establish the Bangladesh College of Agricultural Science (BCAS) in August 1980 to produce B.S. level graduates. To accomplish the objectives as envisioned at that time, the GOB requested the support from the Government of Japan (GOJ) to establish the physical facilities for the BCAS. In response, the GOJ began providing grant assistance through The Japan International Cooperation Agency (JICA) and the BCAS campus was established in March 1983.

The BCAS was basically oriented towards undergraduate training programs with little emphasis on post-graduate studies. A subsequent assessment indicated an increased demand for manpower trained at post-graduate levels which was not being met within the country for various reasons. Thus before the college started functioning, it was transformed into The Institute of Post-Graduate Studies in Agriculture (IPSA) following a decision of the GOB.

(2) Cooperation of JICA and USAID

In response to a request from GOB, technical cooperation between the GOJ through JICA and The GOB began in July 1985 in accordance with the Record of Discussion (R/D) mutually agreed upon. The Government of the United States of America through the Agency for International Development (USAID) began participation in the project in April 1986. The first phase of the technical cooperation program with JICA and USAID continued until July 1990. However, before the termination of Phase I, a tripartite evaluation was conducted by the three governments. Based on the recommendations of the Tripartite Evaluation Team, the Government of Bangladesh requested continuation of both JICA and USAID assistance for a further five years. This period of time became Phase II. On June 14, 1990, JICA agreed to continue their assistance until July 3, 1995. On November 6, 1991, USAID agreed to continue support until October 1993. Up to this time, the developmental activities of IPSA are largely funded through technical assistance by JICA and USAID.

Since the initiation of the Project, JICA has been primarily engaged in assistance in the natural science field and in physical facilities development, while USAID has been engaged in assistance of the social science field and

curriculum development with academic administration through dispatching experts, training, procurement of machineries/equipment and a grant assistance program by both agencies.

The Secretary of the MOA bears overall responsibility for the implementation of the Project. The Director/Rector of IPSA, as the Head of the Project, is responsible for the administration and managerial matters of the Project, and the Japanese Team Leader provides necessary recommendations and advice on technical and administrative matters to the Director. The Coordination Committee, headed by the Secretary of MOA, was established to look after overall project implementation and to address the issues relating to the program for smooth operation of the Project.

(3) Institutional Development of IPSA

Until October, 1988, administrative responsibility for IPSA resided with the Bangladesh Agricultural Research Institute (BARI). Since then, IPSA has been administratively responsible directly to the Ministry of Agriculture (MOA). The Management Committee chaired by the Secretary of MOA was set up as the policy making body for IPSA.

IPSA operated its postgraduate program following the BAU curriculum until 1990. However, with approval of UGC and MOA, IPSA introduced its own course-based curriculum and has been admitting students under its independent masters and doctoral programs since August 1991.

In July 1990, in a meeting of the University Vice-Chancellors a decision was made that IPSA should have an Ordinance with degree granting authority as a fully autonomous institution and be a "Center of Excellence" in the field of agricultural research and postgraduate education. The draft of the IPSA Ordinance, prepared by MOA/IPSA, was endorsed by the GOB Cabinet in May 1993 and is now being processed by the Ministry of Law, before its final approval by Parliament.

(4) Present Status of IPSA

IPSA is located at Salna, Gazipur, about 10 km northwest of Gazipur District headquarters and about 40 km north of Dhaka. It is in close proximity to the Bangladesh Research Institute (BARI) and Bangladesh Rice Research Institute (BRRI) from where it can draw on assistance for its program activities.

There are nine academic departments offering M.S. and Ph.D. degree programs. The departments are agricultural economics, agricultural extension education, agronomy, crop botany, entomology, genetics & plant breeding, horticulture, plant pathology and soil science. The statistics department is not offering a degree, but offers courses as a supporting department. IPSA is a

research oriented educational institution. Therefore, its academic program is operated based on the research program.

As of August 1, 1993, there were 22 full-time faculty members at IPSA out of 49 approved posts. Complementing this IPSA core faculty are over 50 senior scientists from BARI, BRRI and other research and educational institutions who serve as adjunct faculty. These adjunct faculty teach classes and/or supervise thesis research on a part-time basis. There are also 135 administrative and supporting staff in administration, farm, library, engineering, and other sections.

Since implementation of the course-based curriculum began in August 1991, 186 students have been enrolled in M.S. and 11 students in Ph.D. courses. Out of these, 12 students have completed the M.S. course. The academic year consists of three terms, beginning in August, November and May. Students are admitted at the beginning of each term. As of August 1, 1993, there were 93 students in the M.S. program and 9 students in the Ph.D. program.

A Tripartite Evaluation Team (Bangladesh, Japan and USA) evaluated IPSA's academic, research and developmental activities in 1989. For the development and sustenance of IPSA, the Team recommended the continuation of donor assistance for a further period of five years. GOB decided that the life term of the project should be extended up to June 1995 and that the technical support from JICA and USAID should be continued.

Based on the recommendation of the Tripartite Evaluation Team and following a GOB decision, a Record of Discussion was signed between the Govts. of Bangladesh and Japan emphasizing continuation of the Japanese technical cooperation on IPSA. A separate Note of Exchange was signed on December 26, 1990 between the Govts. of Bangladesh and Japan providing grant assistance for the development of library and physical facilities for IPSA. JICA assistance will remain effective until July 3, 1995 and USAID assistance is to continue until October 1993. Meanwhile the revised Project Proforma which extends the life term of the project up to June 1995 was approved by ECNEC on August 5, 1992.

The Institute of Postgraduate Studies in Agriculture (IPSA) will develop into an autonomous institution of higher learning with degree conferring authority. To implement the project successfully for attaining the objectives an appropriate organizational structure with adequate manpower strength has been suggested.

For successful implementation of IPSA's teaching, research and outreach programs, and to strengthen mutual understanding among the collaborating institutions, a Memorandum of Understanding (MOU) between IPSA and BARI/BRRI was signed. A considerable amount of facilities have been created during Phase I and some more facilities are planned for completion during Phase II.

6.2 Goal and Objectives

(1) Goal of the Project

The goal of IPSA Project, Phase II is "to accelerate agricultural development and to improve the economic well-being of the farmers". (Record of Discussions signed on June 14, 1990 between GOB and GOJ).

Similarly, the Mini Project Paper, prepared by USAID/Dhaka in March 1990, described the goal of the Project, as follows, "to improve rural incomes, the quality of life of rural residents, and to enhance agricultural development through training of postgraduates".

(2) Objectives of the Project

The objectives of the Project are "to strengthen postgraduate level agricultural research and education (leading to M.Sc. and Ph.D.) at IPSA and to make IPSA a sustainable institution, thus to contribute to enhancement of higher agricultural education and agricultural research system in Bangladesh" toward the achievement of the goals. (Record of Discussions signed on June 14, 1990 between GOB and GOJ).

The Project will achieve its objectives through conducting the following programs: a. Research program, b. Academic program and c. Outreach program.

The Mini Project Paper also stated that the purpose of the Project was "to establish a sustainable institution which integrates agricultural postgraduate education and problem oriented basic research, improves the quality of agricultural postgraduate education offered in Bangladesh, and which has strong linkages and outreach programs with educational/NARS institutions".

Similarly, the PP of the IPSA Project, approved by the Departmental Project Evaluation Committee in November 4, 1992, stated the objectives of the Project as follows:

- 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 (1985-1990);
- 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, field days etc.

(3) Sustainability of IPSA

Objectives of the Project are to make IPSA a sustainable institution through technical cooperation programs in several fields of IPSA development. In order to achieve IPSA sustainability, the following should be reconfirmed :

i. What is the sustainability of IPSA ?

Briefly, the sustainability of IPSA means that IPSA should become an institution that can continue to fulfill its essential tasks with its own and GOB resources and domestic support without any external assistance.

It can be said that Project objectives have been carried out in order for IPSA to gain sustainability. In other words, IPSA's sustainability will result from the effective implementation of the Project.

ii. Criteria of IPSA's sustainability (see table 1)

a. Autonomy and status of IPSA.

To be a sustainable institution and to attain the goal of the Project, autonomy with full degree granting authority is an essential condition.

Fortunately, since the beginning of Phase II , almost all concerned authorities have agreed that IPSA must have the approved Ordinance/ Act.

b. GOB Funding

Even though IPSA may become an autonomous degree granting institution, quality activities and performance cannot be expected without regular/ permanent funding from GOB. The PCP approved by ECNEC made a provision of adequate fund for most of the institute's activities from the Revenue budget of the GOB after the termination of the Project in June 1995. This provision is quite reasonable and must be carried out for the consideration of IPSA's sustainability.

c. Organization/Administration

In order to be a well functioning organization, the administration and finance wings in IPSA must play an important role in supporting the activities of faculty and related staff. Smooth and active implementation of the programs cannot be anticipated without this support. For strengthening this support, it is essential that authorities/responsibilities be given to concerned departments, divisions and committees and that all activities receive commensurate budget allocations. Computerization for the Information Management System will also help to improve the organization.

d. Activities/Manpower

The best quality manpower will achieve the best quality results. Therefore, manpower development/training and recruitment for high quality teachers are preconditions to develop quality outputs from academic, research and outreach programs.

e. Linkages

Mutual communication, collaborative research, and the sharing of resources with related research and educational institutions will make IPSA a more promising institution. IPSA, which is a newly established institution, cannot develop without cooperation and close linkages with associated institutions. Linkages could be education-research or research-research or education-education in nature.

f. Infrastructure

Adequate physical facilities and their proper maintenance to meet the needs of the teaching, research and outreach programs are very important. Almost all essential facilities are constructed and installed at IPSA except for the residential quarters. Maintenance and efficient use of these facilities is one of the important key issue for sustainability of IPSA.

Table 1. Criteria of IPSA's Sustainability

Area of Sustainability	End of Project Status	Quantifiable indicators	Target/Achievement
1. Autonomy and status of IPSA (institutional development)	1. Acceptance by GOB of IPSA as a autonomous degree granting institution. 2. IPSA has an important position with GOB, MOA.	1. Enactment of the Ordinance/Act. 2. Role of IPSA in the "Third & Forth Five Year Plan".	1. Enactment of the Ordinance/Act. 2. "Third & Forth Five Year Plan" states role of IPSA.
2. GOB Funding (institutional development)	1. Increasing commitment of GOB to provide funds to IPSA. 2. Shift from ADP Budget to Revenue Budget allocation.	1. Ratio of GOB to donor funds 2. Ratio of ADP to Revenue Budget 3. Annual budget allocation and its amount.	1. Increase in the ratio of GOB funds. 2. Increase in the ratio of Revenue budget 3. Sufficient budget allocation at each activities.
3. Organization (administrational development)	Well functioning administrative, finance wings and other supporting services in IPSA.	1. Filling ratio of teacher and staff sanctioned posts. 2. Authority & responsibility of dep., div., and committees 3. Computerization of student, personal, inventories and financial records. 4. Academic department preparing annual work plan and receiving commensurate budget. 5. Utilization rate of library resources. 6. Utilization rate of experimental farm. 7. Maintenance conditions and number of equipment troubled and remained unused.	1. Fill vacant post with quality manpower. 2. Share and demarcating responsibility and clear job discretion. 3. Introduction of IMS and improvement of staff capability for operation. 4. Preparation of "Five Year Master Plan" and annual distribution of budget. 5. Improvement of library management. 6. Improvement of farm management. 7. Establishment and operation of maintenance body and complete inventory.
4. Activities a. Academic program b. Research program c. Outreach program	Well functioning and quality academic, research and outreach program.	1. Course based curriculum operating a. Student/teacher ratio b. Admission standard and number of enrolled student c. Number of graduate student awarded M.S. & Ph.D. d. Number of positions/employments for student. e. Number of lab. incorporated into curriculum. 2. Research Master Plan prepared and followed a. Publication/teacher ratio. b. Equipment meet the needs for research. c. Periodical research review & Journal publication. d. Research programs are implemented as scheduled. 3. Mission Statement and operational program prepared and followed a. Number of seminars, workshops, symposiums and training	1-a. Quality teachers recruitment 1-b. Preparation of quality admission standard and scholarship program. 1-c. Regular operation of course work and regular admission of students. 1-d. All graduate students are engaged in their respective field. 1-e. Incorporation of regular laboratories into courses and preparation of text. 2-a. Increase in publication ratio, reduce teaching load for research. 2-b. Motivation by training and guidance 2-c. Supply equipment served the purpose. 2-d. Hold annual research review and annual publication of Journal. 2-e. Establishment of research management System. 3-a. Clear the Mission Statement, formulate strategic plan and its operation.
5. linkage (institutional development)	Close association with other domestic and international research & educational institution	1. Completion of MOU process. 2. Number of joint research.	MOU with BARI, BARI, DAE, BAU, DU, Kyushu Univ., OSU and related IARCS (ICRISAT, IPPI).
6. Infrastructure (institutional development)	Adequate physical facilities to meet the need of the research, academic and outreach programs	1. Available buildings and their area for teachers and students. 2. Active student and research laboratories in the each department. 3. Construction and occupancy of 210 housing units for faculty and staff. 4. Increase in library collection. 5. Capability of computer center for research, instruction and administrative program.	1. Basic infrastructure were constructed. 2. Student laboratories were constructed and essential equipment are supplied. 3. Fulfillment of precondition and start construction work. 4. Suitable books and Journals covering field of agriculture. 5. Expansion of computer center capability for teacher and student.

6.3 Strategies followed for accomplishment of the objectives (1990-1995)

(1) Institutional Development

Whereas Phase I cooperation emphasized physical infrastructure development, Phase II attached importance to manpower and organizational development through full utilization of the facilities and equipment that has been made available during Phase I cooperation.

Activities are as follows;

- a. Fill the vacant posts and strengthen the capability of faculty, administrators, officers and staff through short- and long-term training and providing guidance/recommendation from experts.
- b. Continue with development of the experimental farm, expansion of the library, upgrading of student laboratories, enlargement of the computing center, and the construction of residential quarters and related infrastructures.
- c. Construct new and/or revise existing administrative structures, processes, and strategies to assure efficient and relevant education, research, and outreach programs with proper/efficient budget allocation.
- d. Establish formal linkages with other research and educational institutions to enable and sustain joint research programs, exchange of scientists and faculty, efficient exchange of research results, and feedback on academic program requirements.
- e. Establish a comprehensive scholarship program to attract and retain the most qualified students, in particular, qualified female students.

(2) Research Program

- a. Based on the achievement of Phase I, continue the development and expansion of problem oriented basic and applied research in line with the TSI. Research activities have addressed important emerging national issues such as biotechnology, soil-water-plant relationships, integrated pest management, environmental studies, variety improvement and post-harvest physiology.
- b. Establish research management system.
- c. Conduct joint research with other research institutions for the best use of know-how as well as resources.

(3) Academic Program

- a. Implement an effective masters degree curriculum developed under Phase II of the Project.
- b. Develop and implement a doctoral program to produce graduates with improved skill and knowledge for research and/or teaching in the government or

private sector.

- c. Implement practical studies by incorporation of laboratory experience into course work based on IPSA's research activities.

(4) Outreach Program

- a. Strengthen the outreach program and define its mission.
- b. Define the mission statement of IPSA and make clear the mandate of IPSA in outreach program.
- c. Accumulate the materials for outreach program.
- d. Develop the Outreach Implementation Plan.

7. INPUT SUPPORT ACTIVITIES

7.1 Dispatching of Experts

Highly qualified technical personnel with specific specialities have been dispatched to the project. The selection of the personnel was based on IPSA needs and the terms of performance specified in the R/D and/or in the USAID/OSU Contract. The technical field of each expert is in accordance with the R/D, revised TSI and Mini Project Paper for the implementation of the Project.

Basically in terms of length of service, there are two types of experts; one is long-term which means that the expert is stationed in the field for more than a year, and the other is short-term or temporary duty personnel who are dispatched for a few weeks/months to the project to provide assistance relative to a specific subject. However, in all instances, the general terms of reference (TOR) of the experts is to provide technical advise/guidance to IPSA faculty and staff, with the focus of activity being with the identified counterpart personnel (C/P), for the purpose of up-grading the quality of manpower at IPSA to implement program activities and management.

In Phase II (current phase) of the project, 154 Man/Months (M/M) of long-term experts and 44 M/M of short term experts have been provided by JICA and USAID (Tables 2,3 and 4). A list of JICA/USAID experts dispatched to date is provided in Annex 1 and their activities are summarized in Annex 2.

Currently, there are ten established departments at IPSA. Each department is charged with responsibilities for teaching, research, and outreach programs. In order to speed up progress in these programs, the C/P must have continuous motivation together with technical guidance to implement plans/ideas to develop skills through program activities. This is achieved by working with experts in the relevant technical fields. Upgrading the quality of research and improvement of the curriculum for practical based education requires continuous support during this critical formative period.

To assist in the development of this rather extensive program, it would be ideal to assign a sufficient number of long-term experts to each academic department. Actually, during Phase II only four long-term experts have been dispatched. These long term persons were in the fields of agronomy, agricultural economics, farm management and agricultural extension. In addition, the Team Leader and the Coordinator were also long term positions. The long term experts in the fields of agricultural economics and agricultural extension were funded by the USAID part of the project. The other long term positions were funded by JICA. The main reason for the lack of additional long term personnel was due to shortage of available scientists at the cooperating Japanese University. Instead of long-term experts, JICA dispatched a number

Table 2. Long Term Experts in Phase I and Phase II (Japanese F.Y.)

Unit: Man/Months

Field	Phase I	Phase II (from Jul.4 '90~)					Total
	1985~90	1990	1991	1992	1993	Sub Total	
Team Leader	46 (2)	2 (1)	12 (1)	12 (1)	12 (1)	38 (4)	84 (6)
Coordinator	57 (2)	9 (1)	10 (2)	12 (1)	12 (1)	43 (5)	100 (7)
Agronomy	24 (1)	—	7 (1)	12 (1)	5 (1)	24 (3)	48 (4)
Entomology	36 (2)	—	—	—	7 (1)	7 (1)	43 (3)
Horticulture	12 (1)	—	—	—	—	—	12 (1)
Plant Breeding	14 (1)	—	—	—	—	—	14 (1)
Plant Pathology	24 (1)	—	—	—	—	—	24 (1)
Farm management	—	—	—	1 (1)	12 (1)	13 (2)	13 (2)
*Curriculum Development	47 (1)	—	—	—	—	—	47 (1)
*Agricultural Extension	12 (1)	12 (1)	—	—	—	12 (1)	24 (2)
*Agricultural Economics	—	—	—	11 (1)	1 (1)	12 (2)	12 (2)
*Curriculum & Res. Devel.	—	—	—	—	5 (1)	5 (1)	5 (1)
Total	272 (12)	23 (3)	29 (4)	48 (5)	54 (7)	154 (19)	426 (31)

* Experts from USAID. () Experts per year. Japanese Fiscal Year is from Apr. to Mar.

Table 3. Dispatch of Long Term Experts in Phase II

Field	1990	1991	1992	1993
Team Leader				
Coordinator				
Agronomy				
Farm Management				
Entomology				
*Curriculum Development				
*Agricultural Extension				
*Agricultural Economics				
*Curriculum & Res. Devel.				

* Experts from USAID.

Table 4. The Number of Short Term Experts/Advisors in Phase I and II (Japanese F.Y.)

Field	Phase I	Phase II					Total
	1985~90	1990	1991	1992	1993	Sub total	
Agronomy	4	2	2	2	(3)	6 (3)	10 (3)
Genetics & Plant Breeding	1	1	1	2	(1)	4 (1)	5 (1)
Plant Pathology	5	1	2	2	(2)	5 (2)	10 (2)
Soil Science	7	3	2	3	(2)	8 (2)	15 (2)
Horticulture	5	2	1	1	(2)	4 (2)	9 (2)
Entomology	2	2	1	2	(2)	5 (2)	7 (2)
Crop Botany	1	0	1	0	(0)	1 (0)	2 (0)
Farm Management	0	0	2	0	(0)	2 (0)	2 (0)
Maintenance of Equipment	6	2	1	0	(1)	3 (1)	9 (1)
*Library Development	0	1	0	0	(1)	1 (1)	1 (1)
*Curriculum Development	0	1	0	1	0	2	2
*Computer System Development	0	0	0	1	1	2	2
*Agricultural Extension	0	0	0	0	1	1	1
*Internal Review	2	0	0	0	0	0	2
Total	33	15	13	14	2 (14)	44 (14)	77 (14)

* Experts from USAID. () planned/scheduled. Japanese Fiscal Year is from Apr. to Mar.

of short-term experts in all departments except for agricultural economics, agricultural extension, statistics and biometry departments. Short-term experts were assigned on a subject matter basis, but continuous motivation and follow up is difficult for these types of positions due to the length of the assignment.

7.2 Faculty and Staff Training

In this project both long term (Ph.D. degree training) and short term (eight to eleven months) training was provided.

During the life of the project all faculty members and most of the senior officers have undergone or are in the process of receiving either long or short-term training. Within the long-term training sponsored by the Japanese Ministry of Education, two faculty members obtained their Ph.D. degrees and three are currently involved in doctoral degree programs in Japan. Through the sponsorship of USAID, three faculty members completed Ph.D. degrees and one doctoral program is currently underway in the U.S. At present, the majority of faculty members are Ph.D. holders.

Regarding short-term training for faculty and staff, nine have participated in such training in Japan and two have been trained in the U.S.A. during Phase I. In Phase II eight faculty members completed training in Japan (see Table 5). Most of the training in the Phase II focused mainly on the training of senior staff such as the administration officer, senior scientific assistants, and the electrical engineer for the express purpose of strengthening the support services at IPSA. During Phase II six faculty members completed training in the U.S.A. The focus of that training was to familiarize the faculty members with the operations of a course-based curriculum for smooth implementation of the newly introduced course work at IPSA. In addition, the Rector of IPSA participated in an observation tour to several universities in Japan and this tour was funded by JICA. The IPSA Rector also participated in an observation tour to the US where he visited universities and research institutes. The tour to the US was funded by USAID.

Candidates for training were selected through a process conducted by the selection committee chaired by the IPSA Rector in accordance with the TSI and the Mini Project Paper. The authority to issue the Government Order (GO) for most training rests with the IPSA Rector.

Most of the faculty and staff have successfully completed their training and it is the opinion of the Evaluation Team that they are highly motivated in their respective technical fields. Faculty members indicated that their technical skills were improved considerably by both short and long term training. Nevertheless, there has been some constraints to the application of the knowledge and skills acquired through the training in IPSA due to several reasons. These reasons include the lack of sufficient financial/administrative support, the lack of continuing long-term

Table 5. The Number of Short-Term Participants Training in Japan and USA. (Japanese F.Y.)

Field	Phase I	Phase II					Total
	1985~90	1990	1991	1992	1993	Sub total	
Agricultural Extension	-	-	-	1	-	1	1
Agronomy/Plant Physiology	1	-	-	1	-	1	2
Corp. Botany (Plant Hormone)	-	-	-	1	-	1	1
Entomology	1	-	1	-	-	1	2
Genetics & Plant Breeding	1	1	-	-	(1)	1 (1)	2 (1)
Horticulture	2	-	-	-	(1)	- (1)	2 (1)
Plant Pathology	1	-	-	1	-	1	2
Soil Science	1	-	-	-	(2)	- (2)	1 (2)
Farm Management	1	1	-	-	-	1	2
Maintenance of Equipment	-	-	1	-	-	1	1
Agricultural Machinery	1	-	-	-	-	-	1
Observation Tour to Japan	-	-	1	-	-	1	1
Administrative Management	-	-	1	-	-	1	1
*Observation Tour to USA	-	-	-	1	-	1	1
*Library Development	1	-	-	-	-	-	1
*Maintenance of Equipment	1	-	-	-	-	-	1
*Curriculum Development	-	-	-	2	4	6	6
Total	11	2	4	7	4 (4)	17 (4)	28 (4)

* Training in the USA. () planned/scheduled. Japanese Fiscal Year is from Apr. to Mar.

expert involvement/support, the nature of the organization/society, and a lack of adequate manpower as well as other constraints.

Consequently, it is important to improve the monitoring/evaluation system relative to the application of knowledge acquired through training and to share the skills/information learned in the training experience among faculty and staff.

A list of persons who received training to date is provided in Annex 3. Training accomplishments are summarized in Annex 4.

7.3 Dispatching of Special Teams

Prior to Phase II, in June 1990, an Implementation Survey Team was dispatched from the GOJ through JICA. The purpose was to exchange views on content and methods of cooperation for Phase II, in accordance with the recommendations of The First Tripartite Evaluation July, 1989). The Record of Discussion (R/D) was signed on June 14, 1990 between the GOJ and GOB for five years of Phase II technical cooperation. Phase II began on July 4, 1990. Also, a Memorandum of Understanding was signed between JICA and USAID on June 14, 1990 regarding Joint Technical Cooperation for Phase II of the project.

In October of 1990, a Consultation Survey Team was dispatched to Bangladesh to develop definitive plans for implementation of Phase II. As a result of discussions among the Survey Team, IPSA faculty/staff, JICA and USAID experts, a Tentative Schedule of Implementation (TSI) was agreed upon and recorded. The Survey Team also discussed pending issues from Phase I as well as issues which had arisen in Phase II. The purpose of these discussions was to expedite immediate solutions for the smooth implementation of the Project.

In December of 1992, a Technical Guidance Team was dispatched to review the progress and achievements of the project. Based on this review, the TSI was revised and various unresolved issues were identified. Necessary action to resolve these issues by the concerned authorities was mutually recognized and the Minutes of Discussions were signed by the Team Leader and the IPSA Rector. The Team also attended a Coordination Committee meeting chaired by the MOA Secretary. At that meeting, the Five-Year Research Master Plan for IPSA, among other issues was discussed and conclusions were reached.

A Team for Equipment Maintenance and Repair was dispatched in April 1991. The Team conducted a survey of the condition of the equipment at IPSA, repaired some equipment and provided suggestions/information relative to the maintenance of equipment at IPSA.

A summary of the dispatched teams is presented in Table 6, and their comments/recommendations are summarized in Appendix 14.5.

Table 6. List of Teams Dispatched as of August 1, 1993

Name of the Team	Duration	Purpose
Implementation Survey	Jul. 5, 1990 - Jul. 15, 1990	Formulating the Project Master Plan and Signing the Record of Discussions (R/D)
Consultation Survey	Oct. 5, 1990 - Oct. 15, 1990	Formulating the Tentative Schedule of Implementation (TSI)
Equipment Maintenance	Apr. 25, 1991 - May. 4, 1991	Providing maintenance guidance and repair of equipment
Technical Guidance	Dec. 13, 1992 - Dec. 24, 1992	Review of Project progress and revision of the TSI

7.4 Procurement of Machinery and Equipment

IPSA emphasizes practical education to provide highly skilled manpower to the nation and strive to be a problem oriented basic research institution for agricultural research and development. In accordance with these objectives, one of the essential prerequisites for the institution is to have the necessary instruments, equipment, machinery, and library facilities for the program. Basic facilities of IPSA including buildings were originally provided by the GOJ for BCAS. Therefore, one of the major steps in Phase I was to make essential facilities and equipment available to meet the requirements of the postgraduate education and research programmes.

In Phase II, major machinery and equipment items were also procured through the technical cooperation and grant assistance programs of GOJ/JICA to cope with various program activities. Equipment already provided has been installed in each of the subject matter laboratories, farm, and function rooms according to teaching, research, and outreach needs and for the maximum utilization by faculty, students, and staff (see Annex 5).

The provision of a number of micro-computers and related equipment by USAID has established and improved the computing capability at IPSA. The Computer Center will expand its function for faculty, staff and students under the "Automation Plan" prepared by USAID. This plan will enable IPSA to improve the management of several information bases such as manpower/personnel, research, inventory, library, student advising, student records, and institutional accounting as well as others.

Equipment provided to IPSA is of high quality for agricultural research and education. Consumable items such as chemicals, glassware and stationary are stored in air-conditioned areas. The main goal relative to the management of the equipment is to simplify the task of inventory control and replenishment.

Machinery and equipment procured or to be procured by JICA or USAID is subjected to a selection process which includes close cooperation between JICA, USAID and the IPSA faculty. During Phase I, the Laboratory Committee played an important role in the selection of laboratory equipment. However during the past three years, the Laboratory Committee was largely non-functional and as a result laboratory equipment selection was made by the experts based on prioritized requests from the IPSA departments, input from the Rector, and budget allocation.

The basic rules for selection and provision of equipment is to (a) eliminate consumable items and low maintenance capacity equipment (select simple mechanisms), (b) promote local procurement, and (c) use for common facilities (maximum use of limited resources). In spite of this selection criteria, the procured equipment was not always the most appropriate due to the non-availability of certain items, the high price of imported goods

in the local market, and consideration of inappropriate use or possessiveness of items on the part of individual staff members/departments.

With the above constraints in view, the technical experts worked to acquire the needed equipment. In consideration of the available maintenance service, all computers and related equipment was procured in the local market. Repair service of tractors, vehicles, gas generator and some laboratory equipment is also available locally. Recently, three electric ovens and some other simple equipment items were manufactured in a local workshop under the supervision of the JICA expert. As much as possible, such local manufacture capability will be utilized for a number of reasons.

In terms of maintenance of equipment, the potential of the local market should be explored. This factor is important as a sufficient number of equipment items have already been provided to IPSA. Maintenance of this equipment is important. The supply of spare parts will be an important consideration of commodity procurement in the future.

7.5 Physical Infrastructure and Campus Development

(1) Construction of Facilities

The basic structures such as the administration building, faculty building, student laboratories, classrooms, student dormitories, cafeteria, and a medical center were constructed under the GOJ grant assistance program in March 1983. Since they were originally designed for use in undergraduate education programs, additional construction, remodeling of laboratories, and conversion of some classrooms into faculty laboratories became necessary to upgrade and design the facilities for postgraduate education and research activities. Remodeled facilities and those constructed during Phase I are shown in Table 7.

In addition to the facilities developed in Phase I, the library building, student laboratories for agricultural extension education, crop botany, horticulture, and plant pathology departments, and the field laboratory were constructed in March 1992 by the GOJ second grant assistance program. The purpose of the GOJ program was to further strengthen research, education and outreach capabilities of IPSA. The farm office building, soil processing yard and five vinyl pipe houses were also constructed. A greenhouse, built in Phase I, was remodeled into a well ventilated net house isolated from insect vectors. These facilities are designed to meet researcher's requirements for various types of field experiments to some degree.

IPSA has also made efforts to improve facilities by utilizing its own budget. A roofed concrete yard was constructed for the processing of sample crops. In addition, garages, a cattle barn, seed beds, canal, reservoir, and an in-campus fence were also

constructed. The workshop building was expanded to a second floor for the engineering section. Remodeling of the meeting room into a air-conditioned student computer laboratory was also completed.

(2) Land Development for Field Experiments

IPSA owns about 80 ha of land for its campus. In Phase I, 16 ha of experimental farm was developed for the faculty and student research activities. A modern irrigation system, complete with a pump station, a water storage pond, drainage system and farm road has also been installed. Other basic infrastructure such as garage, farm house and storage room was constructed in the existing field area.

Since the introduction of course-based curriculum, the number of field experiments for students has been increasing. In addition, the amount of faculty research experiments has also increased.

In Phase II, improvement of the soil conditions of the experimental plots has been identified as the top priority for efficient use of the experimental farm. This is especially relevant for the 8 ha of land most recently developed. With the increase in the number of field experiments, the need for the establishment of a farm management system has been recognized as important. IPSA has been seeking to establish the best method of farm management in close cooperation with the JICA experts. The outline of utilization of the experimental farm is shown in Fig.1.

Several private pockets of land are presently scattered over the campus. IPSA has made an effort to purchase all privately owned land in order to maintain campus security and to undertake smooth land development activities. Recently, security conditions have worsened in the experimental fields. A number of hydrants, part of the irrigation facilities, and some experimental materials have been stolen. Purchasing of the pockets of land and the building of boundary fences should be the first priority of land development.

On the other hand, IPSA has developed and financed a large scale canal and additional reservoir. To date, however, IPSA does not have a comprehensive master plan for land/campus development. Such a plan must be prepared to include facilities and planned construction/renovations. The latter items should be prioritized in order to make efficient use of the IPSA budget and other possible future funding.

7.6 The Administrative Structure

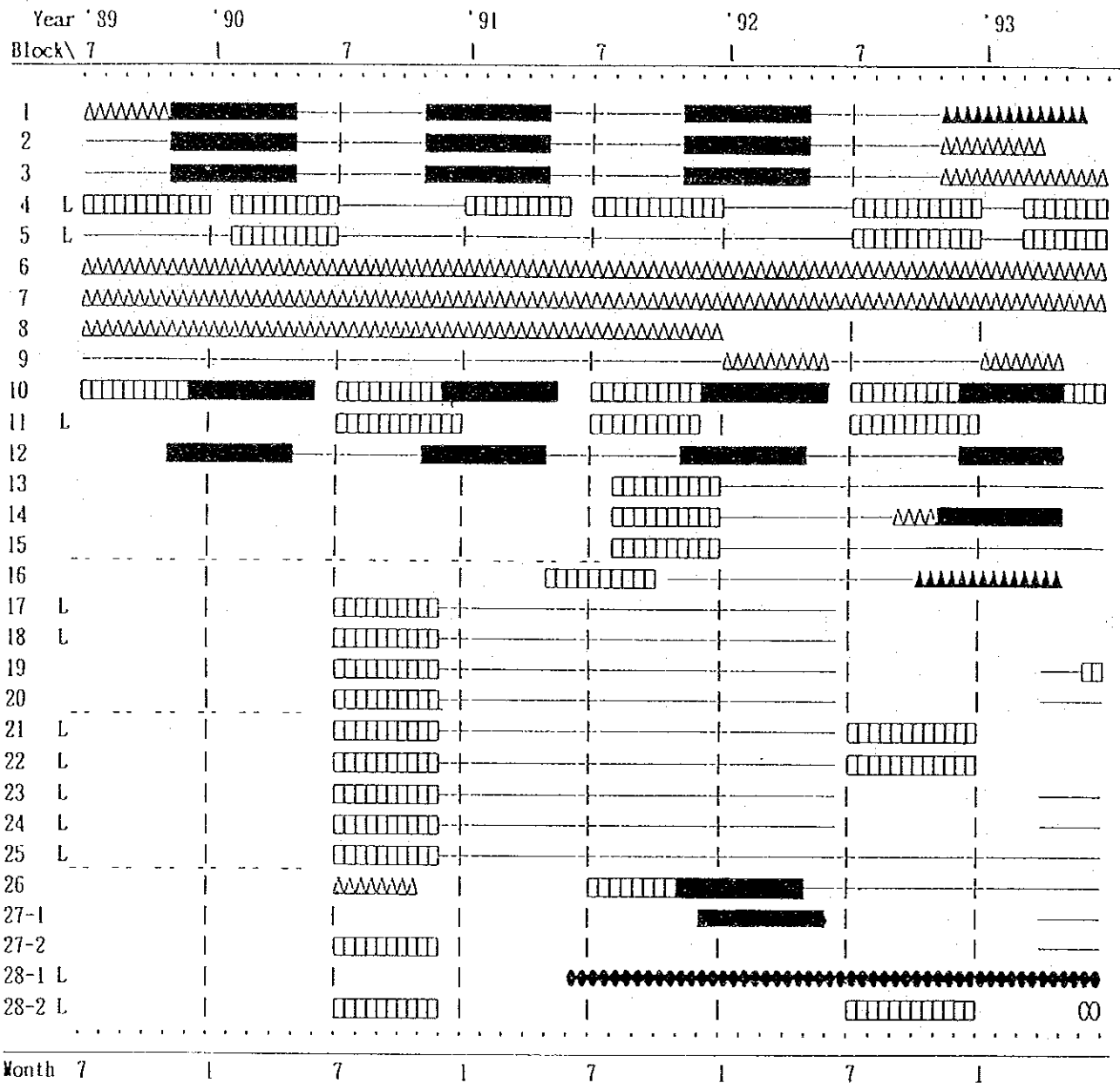
A Management Committee headed by the Secretary of the Ministry of Agriculture has been established to look after the overall management of IPSA. This Committee is equivalent to a Board of Regents and will continue its functions until the IPSA

I P S A B U I L D I N G S

Table 7.

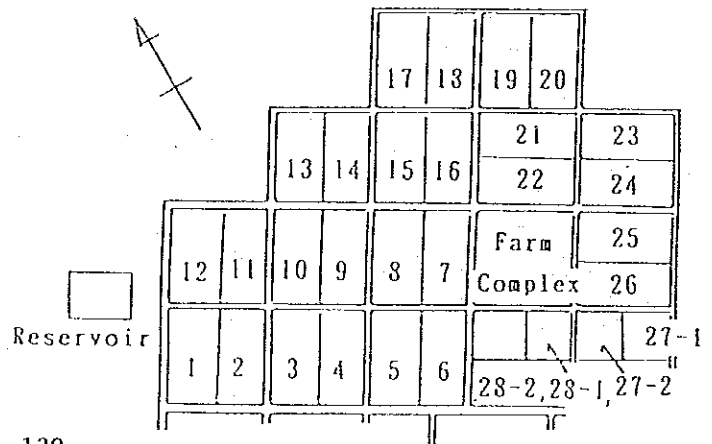
Building \ Funded by	PHASE I			PHASE II			Total (m ²)
	Grant/Jpn	JICA	IPSA	Grant/Jpn	JICA	IPSA	
Administration Bldgs							
Administration Bldg	1,160						1,160
Faculty Building	1,595						1,595
Academic & Research							
Faculty Laboratory	1,985						1,985
Student Laboratory	1,020			654			1,674
Field Laboratory				270			270
Supporting Facilities							
Engineering Building	375		225				600
Community Facilities	315						315
Library				1,330			1,330
Farm Office Building					152		152
Working shed/Store		170					170
Farm Store		240					240
Farm Garage						310	310
Threshing shed/loor						206	206
Cow shed						62	62
Housing							
Dormitory	5,203					37	5,240
Staff House	737						737
Total	12,390	410	225	2,254	152	615	16,046

Fig. 1 Use of the Experimental Field at IPSA since July, 1989



LEGEND

- : Wheat
- : Rice
- ▲▲▲▲ : Wheat, Potato, Maize, Mungbean
- △△△△ : Other crops (Country bean, Ground nuts, Pulses, Radish etc.)
- OOOO : Seed bed
- : Compost preparation and Cow dung preservation
- : Green manuring
- L : Low land



Ordinance is enacted.

Aside from the Management Committee, the Coordination Committee has been established as per provision in the R/D in order to interface between project level decision making and resolution of issues beyond that level. This Committee is composed of representatives of the GOB, JICA and USAID, and it is chaired by the Secretary of the MOA.

The Team Leader of the Project is in close communication with the IPSA Rector. The on-campus coordination meetings, chaired by the IPSA Rector, meet once or twice a month on a regular basis to discuss and solve issues relative to the project. The Committee consists of four members and includes the Dean, the Team Leader, the Project Coordinator, and the long term USAID Expert.

However, with respect to the day to day management of IPSA, the IPSA Rector governs all matters of administration and accounting. Authority and responsibility has not been vested in the Deputy Directors, Assistant Directors or other officers. Therefore, the importance of regular coordination meetings is obvious relative to the coordination of the institution. In addition, the meetings allow for the incorporation of the ideas of the technical cooperation team as well as faculty into the decision making process of the Rector.

7.7 Staffing (Faculty and Staff)

According to the Project Proforma (PP) of Phase II, a total of 221 posts for faculty and staff was approved by the GOB for IPSA.

As of August 1, 1993, there were 22 full-time faculty members out of 49 approved posts. Five positions are filled at the professor level, nine at the associate professor level, and eight at the assistant professor level, and one as lecturer. All the present faculty members are assigned to a department and every one is charged with responsibilities in education, research, and outreach programs. The average number of existing faculty members is 2.2 per department while in some cases only one faculty member is assigned to a department. In addition to the faculty members, six senior scientific assistants are assigned to agronomy, entomology, genetics & plant breeding, horticulture, plant pathology, and the soil science department for assisting faculty and student research activities. The present number of faculty members and current vacant posts is provided in Table 8.

There are 20 senior staff members out of 221 posts assigned to supporting sections as a chief or deputy chief officer in the areas of administration, library, engineering, farm, security and others. Another 115 junior staff members are assigned to either academic or administration/supporting sections. The present number of staff and their positions is provided in Table 9. The allocation of faculty and staff members is shown in Fig.2.

Table 8. Number of the IPSEA Teachers and Sanctioned Posts in Previous PP & NEW PP

Department	Professor		Assoc. Prof.		Asst. Prof.		Total	
	OLD PP	NEW PP	OLD PP	NEW PP	OLD PP	NEW PP	OLD PP	NEW PP
Agril. Extension	1 (1)	(1)	0 (1)	(2)	1 (1)	(2)	2 (3)	(5)
Agril. Economics	0 (1)	(1)	0 (1)	(1)	0 (1)	(1)	0 (3)	(3)
Agronomy	1 (1)	(2)	1 (2)	(2)	1 (2)	(2)	3 (5)	(6)
Crop Botany (Agr. Biology)	0 (0)	(0)	1 (1)	(2)	0 (1)	(1)	1 (2)	(3)
Entomology	0 (1)	(1)	1 (1)	(2)	0 (1)	(1)	1 (3)	(4)
Gene. & Plant Breeding	1 (1)	(1)	2 (2)	(3)	1 (2)	(2)	4 (5)	(6)
Horticulture	1 (1)	(2)	1 (2)	(2)	2 (2)	(2)	4 (5)	(6)
Plant Pathology	1 (1)	(1)	1 (1)	(2)	1 (1)	(2)	3 (3)	(5)
Soil Science	0 (1)	(1)	1 (1)	(2)	2 (2)	(2)	3 (4)	(5)
Stat. & Biometry	0 (0)	(0)	1 (1)	(2)	0 (1)	(1)	1 (2)	(3)
Agril. Engineering	— (0)	—	— (1)	—	— (1)	—	— (2)	—
Animal Science	—	(0)	—	(1)	—	(0)	—	(1)
Agroforestry	—	(0)	—	(1)	—	(0)	—	(1)
Fisheries	—	(0)	—	(1)	—	(0)	—	(1)
T o t a l	5 (8)	(10)	9 (14)	(24)	8 (15)	(17)	22 (37)	(49)

1. OLD PP : Approved in Sep. 1989 for Phase I.

2. NEW PP : Approved in Oct. 1992 for Phase II.

3. () : The number of Sanctioned Posts.

Table 9. Manpower Appraisal as of August 1, 1993.

Department /Section	Faculty/**Officer			*** Staff			Total		
	Exist.	Sanct.	Vacan.	Exist.	Sanct.	Vacan.	Exist.	Sanct.	Vacan.
Director/Rector	1	1	0	1	6	5	2	7	5
Register	0	1	1	0	3	3	0	4	4
Dean's Office	-	-	-	0	3	3	0	3	3
Research Cord. Office	-	-	-	0	1	1	0	1	1
Agric. Economics	0	3	3	0	1	1	0	4	4
Agric. Extension	2	5	3	2	2	0	4	7	3
Agronomy Dept.	* 3	6	3	3	3	0	6	9	3
Crop Botany Dept.	1	3	2	2	2	0	3	5	2
Entomology Dept.	* 1	5	4	3	3	0	4	8	4
Gen. & Pl. Breeding Dept.	* 4	6	2	3	3	0	7	9	2
Horticulture Dept.	* 4	6	2	2	4	2	6	10	4
Plant Pathology Dept.	* 3	5	2	3	3	0	6	8	2
Soil Science Dept.	* 3	5	2	3	3	0	6	8	2
Stat. & Biometry Dept.	1	3	2	1	2	1	2	5	3
Agroforestry Dept.	0	1	1	-	-	-	0	1	1
Animal Science Dept.	0	1	1	-	-	-	0	1	1
Fisheries Dept.	0	1	1	-	-	-	0	1	1
Administrative Sec.	3	5	2	12	32	20	15	37	22
Account & Finance Sec.	2	2	0	4	10	6	6	12	6
Library Sec.	1	1	0	2	5	3	3	6	3
Farm Sec.	1	3	2	28	20	▲ 8	29	23	▲ 6
Engineering Sec.	4	5	1	20	23	3	24	28	4
Medical Center	1	1	0	1	10	9	2	11	9
Dormitory	-	-	-	12	13	1	12	13	1
Total	35	69	34	102	152	50	137	221	84

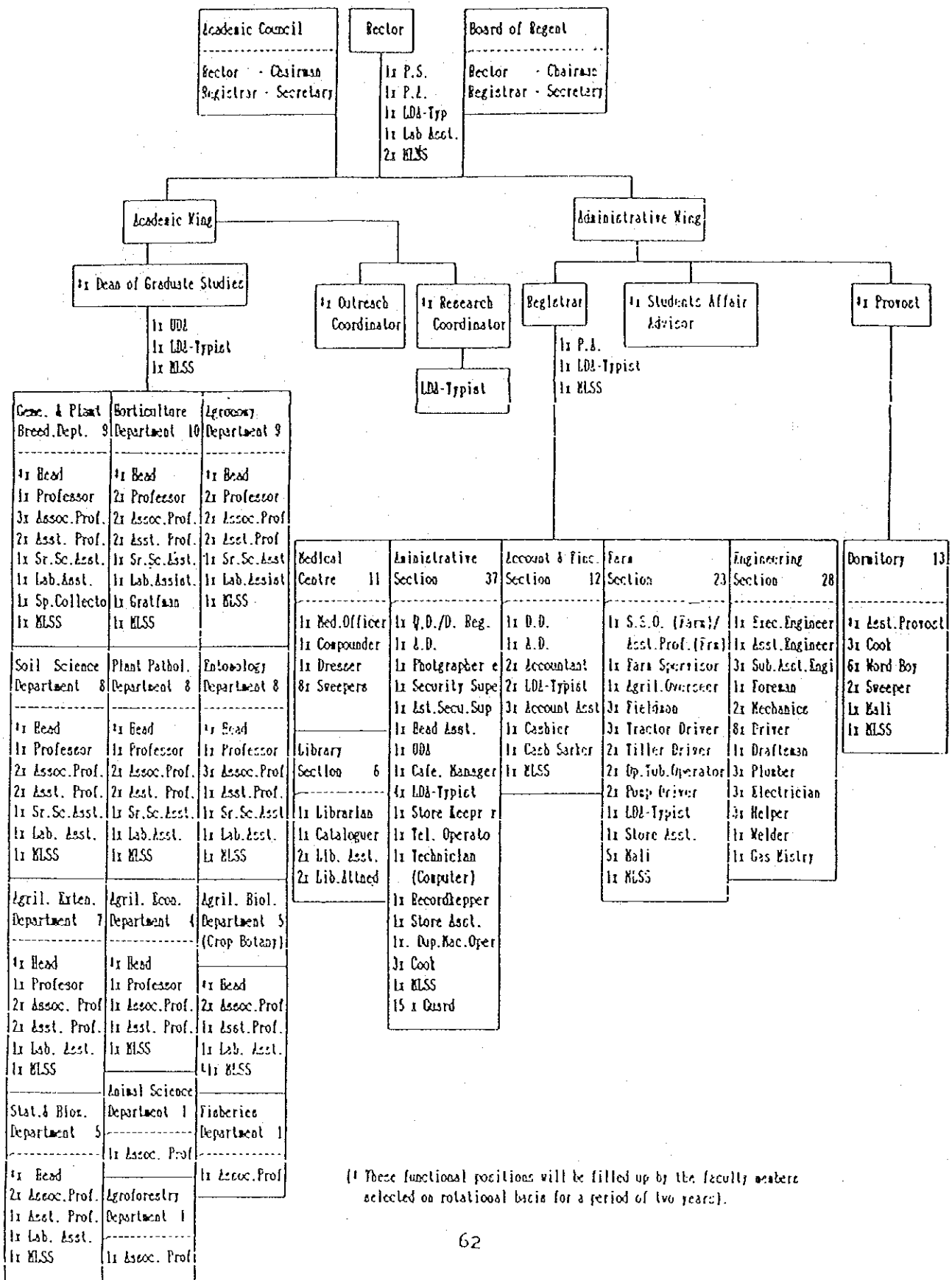
Exist. : Existing Posts Sanct. : Sanctioned Posts Vacan. : Vacant Posts

* : Senior Scientific Assistant is not included (counted as a staff)

** : From grade 1 to grade 11

*** : From grade 12 to grade 20

Fig. 2 ORGANIZATION 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).

7.8 IPSA Project Budget

The IPSA Project has been funded for its operation and development activities by the Annual Development Program of the GOB (ADP) allocation. The financial year of Bangladesh begins on July 1 and ends on June 30. The approved budget for the Project is released on a quarterly basis.

The major development activities (procurement of machinery and equipment, dispatching of experts, participant training and construction of buildings) are largely funded through technical assistance by JICA and USAID.

In Phase II, the ADP allocation was increased year by year. The total allocation from July 1990 to June 1992 was Tk.143.6 million and the total expenditure was Tk.117.4 million. In 1992, Tk.30.5 million of PL-480 funds from the U.S. government was utilized for scholarships and residential housing construction (Table 10).

With respect to distribution of the budget to each activity in IPSA approximately 4.9 % of the total ADP allocation in the Phase II, was earmarked for research and education activities and expenditure of these activities was only Tk.4.7 million. On the other hand, the ratio of miscellaneous expenditure count for more than 20 % of the total allocation(see Annex 6).

According to the PP approved by the GOB, after June 1995 most of the Institution's activities will be funded from the revenue budget of the GOB. This important decision was made by the ECNEC. The GOB's revenue budget allocation is one essential condition for IPSA's sustainability beyond July 1995.

The following table indicates the approximate financial contribution made available by Japan, the United States of America, and the Government of Bangladesh during both Phase I and II.

7.9 Project Supporting Bodies in Japan and the USA.

Since Phase I, in order to support the Project input activities conducted by JICA and USAID, Kyushu University, Saga University, and Oregon State University have been of significant support to the development of IPSA.

Kyushu University has contributed to the nomination of the experts, assisted in implementing participants training program, and provided technical guidance to JICA in collaboration with Saga University, Kagoshima University, Miyazaki University, Yamaguchi University, and Ryukyu University.

Similarly, Oregon State University through a contract with USAID, contributed in various ways to the development of the institution and faculty. The University has nominated and dispatched senior highly qualified long- and short-term experts, arranged participant training overseas, taught academic and short-

Table 10. IPSA Project budget in Phase I & II.

(1 Lakh = 0.1 Mill.)
(T.K. in Lakh)

Source	Phase I	Phase II					Total
		1990	1991	1992	1993	Total	
¹ Bangladesh (allocation)	*1,197	234 (236)	455 (500)	485 (700)	—	1,174 (1436)	2,371
² J I C A	*3,548	1,522	242	348	—	2,112	5,660
³ U S A I D	** 491	72	98	* 120	**255	545	1,036
T o t a l	5,236	1,828	795	953	—	3,831	9,067

* : Including Grant Assistance Program (1981-1983)

** : Actual expenditure, (indorsed budget was TK.755.20 lakh)

: Jan. 1, 1992 ~Mar. 31, 1993.

: Apr. 1, 1993 ~Oct. 31, 1993.

1 : Financial Year is from July to June.

2 : Financial Year is from April to March.

3 : Financed by PIL (Project Implementation Letter)

Including ARPII fund amount of TK.196 lakh.

courses at IPSA, introduced for the first time several new computerized information management systems and provided for the procurement of books, journals and computer equipment.

7.10 Financial Support for Students

During the 1989 evaluation of IPSA the question of scholarships for students was discussed. This was considered an important item because under the prevailing Bangladesh conditions it is not likely that the better students will come to study at IPSA without an incentive program. Without better students it will be difficult to make IPSA a centre of excellence. In fact, sustainability of IPSA will be doubtful without a steady inflow of meritorious students. Good teachers and modern research facilities cannot compensate for the lack of students. Therefore, good students are as important as highly qualified teachers and excellent research facilities together with adequate funding for carrying on the teaching, research and outreach programmes. It is not enough that good students should seek admission to the program but they should continue, and successfully finish their academic programme with a degree.

As a result of these considerations, IPSA introduced a financial assistantship scheme. However, even with the assistantships the dropout rate is still higher than desirable. The job market for agricultural graduates appears to be weak and with further deterioration in the job market, more graduates will be compelled to seek higher study. This is not a healthy sign as under those conditions the students will drop out as soon as jobs become available. Efforts should be made to attract students rather than create a sense of compulsion. One step may be to make higher degrees obligatory for joining research institutions as a researcher. The other step may be to give increments and/or seniority status when joining the research institutes after receiving a higher degree.

A flexible training policy, if adopted in the research institutes, will ease the situation of academic program drop outs and will give the students incentive to complete the study programme.

Presently at IPSA, master's students receive a sum of Tk.225 to Tk.300 per month and doctoral students are given Tk.450 to Tk.500 per month depending on the student's academic record. Eight scholarships at Tk.800 per month for the whole institution are now available.

Depending on the availability of funds and the needs of the research programme, up to 30 students may receive research assistantships or fellowships which provide some financial benefits in exchange for work. With the shrinking of available overseas scholarships the quality of students coming to IPSA will probably improve. Moreover, the BAU attracts some graduate students which affects the number of students at IPSA. Finally it boils down to

the fact that personal factors influence individuals in decision making about higher studies.

In addition to financial help offered by IPSA, in-service students from research institutes receive either part or all of their usual pay and allowances. The in-service student enrollment has declined recently. Such students should not only get proper compensation during the study period but after the degree is awarded there should be some reward in terms of increments and promotional possibilities when they return to their positions.

It is the opinion of the Evaluation Team that the present scheme for financial help for students of IPSA is not satisfactory. Considering the cost of living in Bangladesh the amount should be increased and the number of financial programs should be increased. If the number of assistantships and fellowships can not be increased then the general scholarship scheme should be reviewed.

In entry level positions, agriculture graduates receive starting pay and allowances for a total of about Tk.4200/-per month. Keeping this in view the realistic approach would be to provide a stipend of Tk.1000/-per month for each M.Sc. student and Tk.2000/-per month for each Ph.D. student as stipends. An additional Tk.3000/-per month for meritorious students in the form of a fellowship or assistantship should also be provided. In addition, the expenses for secretarial assistance and thesis preparation should be reimbursed or a grant may be given to every student as they complete their degrees.

It should be noted that the desire for a B.S. degree arises from the student's career considerations. Once the degree is awarded the student has a choice either to go for a job or to go for higher study. Adequate incentives at IPSA in the form of financial help would provide an additional reason for B.S. students to enter graduate studies.

7.11 GOB Budget for IPSA

Although GOB funding has been indicated as necessary in the project proposal by ECNEC, the situation may change and thus monitoring of the situation is needed. Subsequently, revision of the project proposal may become necessary. Most of the research and academic inputs have been made available through donors and it is obvious that the IPSA faculty is concerned about the special care required from the MOA as such care is essential for its sustainability. It should not be treated simply as a research institute nor should it be treated as other universities in terms of national indicators. At IPSA the emphasis is on quality and not quantity.

The normal revenue budget takes care of pay and allowances of teachers and employees but enough foreign exchange allocation with sufficient local fund support for teaching, research and to maintain laboratories should be provided in GOB funding. Funding

for incentives for students in the form of stipends/scholarships/research assistantships should also be provided in the revenue budget. The components of the revenue budget for IPISA should be rational and balanced to ensure the overall development of IPISA.

8.0 PROGRAM ACTIVITIES AND ACCOMPLISHMENTS

8.1. Institutional Development

Relationship of IPSA Units: Since the production of highly 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 and to meet the immediate demands of the nation, IPSA plans to implement three major programs which are (1) research, (2) education, and (3) outreach. At the present time, the research and education programs are being implemented and plans are being developed for the outreach program.

These programs are not operated separately, but interact closely. The coordination of theory and practice is essential. IPSA's education program emphasizes laboratory work and thesis research to explore and to develop theories. In order to implement such a research education program, the curriculum/syllabus should be substantial and should be prepared by the teaching faculty. Consequently, the teachers must be quality researchers. In IPSA, the research program is considered as the most important tool for education. Quality research activities are in direct relationship to quality education.

IPSA has an obligation to disseminate research results in an efficient manner. The outreach program will be designed to organize such activities. New technology and knowledge developed by research activities flows to the students and other benefit groups through outreach activities. In turn, a better understanding of the problems faced by the target population in the outreach program is to be communicated to the research program and teaching systems to strengthen and invigorate the search for knowledge. Therefore all of the elements of the academic program influence each other and the relationship is interactive.

Administration and Management: While the present IPSA administration and management system is not specifically designed for a degree granting academic institution and is more appropriate for a government unit it is anticipated that after the Ordinance is approved that the management organization will be more relevant to what is required for a university. However, in spite of the government overlay the institution is functioning and some unique management systems have been instituted. The majority of the newly instituted or in-process systems is based in computer programs specifically designed for the conditions and work at the institution.

Research Management: The Research Information System (BARIS) was designed by the long term USAID/OSU Technical Assistant/Expert for use in the management of research for all of the academic departments. Each experiment is assigned a code number which will remain with the activity throughout the tracking and reporting process. Other identifying information includes start date, department, study title, overall objectives, justification, and

methodologies. In addition, the location of the research activities are tracked as well as the researchers' names and amount of time devoted to the experiment. Data relative to publication include the abstract, research results/accomplishments and key words which are part of the access process.

The information detailed in the preceding paragraph is inputted as the research study processes. When the experiment is completed, additional information is added which includes specifics about the relationship between established technology/methodology against which the new technology was tested, details of the technology developed in the experiment, and the comparative advantage of the newly developed technology. The final entry in the BARIS is the list of references which relates to the experiment.

The BARIS system is activated for each experiment in the initial period of the activity and updated on a yearly basis until the experiment is completed and published. The value of such a system for the management of research is obvious in the short term as well as in the historical perspective. The department and the institution as a whole, therefore, has a powerful planning tool (BARI) which can be used in a multiple ways to reach the ultimate goal of agricultural research which is to improve the economic well-being of the citizenry of Bangladesh. Thus, research management becomes both an educational tool and a requirement for the training of postgraduate agricultural students, as well as an applied tool for solving agricultural production, marketing and development problems. Since the research is supported by IPSA, the Bangladesh Government, outside donor agencies, and by direct contracts, the importance of tracking the research for reporting, accountability and linkages is evident. The BARI system meets those needs.

Department personnel have been trained in the use of the BARIS system and have incorporated the system into the routine planning process within the department.

Department Reporting Relative to the Five Year Plan: An additional computer program utilized in the individual departments includes a broader informational base. Specifically this program compares the Five Year Plan departmental goals with the achievements within the department. The computerized tracking includes enrollment/student statistics, research programmes, research achievements, publications, and completed thesis titles.

Committee Structure: It appears that the committee structure is not operating as fully as it was envisioned. Such committees as the boards of study, teachers' council, seminar committees, computer policy committee, curriculum committee and others should be operating and providing leadership to the programmatic part of the institution. It is to be noted that Professor Eisgruber's 1992 report recommended that the committee structure should be reviewed with a long term perspective as criteria. This type of review is

still needed and more of the recommended committees should be established.

Planning: Basic to IPISA's administration is an adequate planning system. The Five Year Master Plan (1990-1995), based on the TSI was developed by IPISA contains the mandate of the institute, description of various clientele for institute research outputs, achievements during the third five year plan (research, management of research programmes, manpower development, finance/accounting, and institute facilities), institute organizational structure, research goals/targets and broad programme areas, research priorities, manpower appraisal, status of the institute facilities, and financial implications. The preparation of the document itself is a management process which involves faculty in decision making in a planning mode. This overall process is built on planning within the departments and the results should be utilized by IPISA central management to ascertain whether the current management structure is responsive and supportive of the planned activities. Currently, the present Five Year Plan is in the process of being revised and finalized.

Institutional Linkages: Institutional linkages are important to the development of the institution for a variety of reasons. At this time a significant amount of research conducted at IPISA is in cooperation with scientists from BARI, BRRI, SRTI, BAU, Dhaka University, BINA and others. While the administration of IPISA supports the performance of such research linkages the need for formal MOUs is still evident. The present IPISA administration recognizes this and is prepared to move into such a mode after the Ordinance has been formally approved by the GOB.

Students' Records: One area which has utilized a significant amount of time on the part of administrators and faculty, as well, has been the construction and maintenance of student's records. To meet this need, a computerized program was designed and at this point approximately 80% of student records have been put into the data base. It is estimated that all of the records will be computerized in a relatively short time.

Manpower Development: In addition to long-term academic training in both the U.S.A. and Japan there has been on-going faculty and staff improvement and upgrading via in-service or short term training. For example, the librarian and the engineer at IPISA have undergone short term training in the U.S.A. and one administrative staff person was trained at Kyushu University in Japan. On-the-job training has been provided to members of the financial section of the institution relative to the newly introduced financial computer program. Additional training in various other computer management programs has been planned.

The development of written job descriptions was undertaken by Dr. Witters and that information is now complete. The descriptions will be entered and become part of a computerized data base for use by IPISA administration.

Institute Finance/Accounting: At present, IPSA is under the overall guidance of a Management Committee chaired by the Secretary of the Ministry of Agriculture. This Committee will continue to function in a governing capacity until the Ordinance is enacted. Until such time, the institute is functioning under the Ministry of Agriculture and follows GOB financial and accounting procedures.

However, even though the institute is subject to GOB financial and accounting procedures, it became apparent that those procedures should and could be streamlined. As a result, a short term USAID/OSU expert worked with the financial office and prepared a computer program which is designed to save time, provide ready access to the status of the financial/accounting records, and develop a historical record which will aid in planning, reporting and managing. The program provides information on transactions as to amount, timing, responsible area, and others.

A computer program for the payroll system has been designed by a USAID/OSU specialist and training is in process relative to this program. An additional accounting computerized system was also developed by the same specialist. The result is that one month of records can be entered in less than two hours by the trained financial staff.

Institute Facilities: The utilization of institute facilities is one aspect of institution management which is important in the operations of the institute's programs. Established buildings or areas include the library building, computer centre, class lecture rooms, laboratories (electron, microbiology, crop physiology, analytical, chemistry, tissue culture, soil physical, and entomology), research land, meteorology station, auditorium, dormitories, and a medical centre. While maintenance planning is needed at the present time the above listed facilities are in working condition and are being utilized.

The USAID/OSU expert is in the process of preparing a computerized engineering bid system which would streamline the procurement process in the engineering unit. Additional computer programs which relate to facilities and which are in the process of finalization is the dormitory record system and the equipment inventory system. These computerized systems are scheduled to be complete and on-the-job training provided before the departure of the present USAID long term person in October 1993.

8.2 Research Program

One of the important mandates of IPISA is to conduct agricultural research. Since IPISA was established for producing high quality, skilled manpower to support the "National Agricultural Research System" in Bangladesh, research activities have been a foundation of this high quality postgraduate education program. Particularly, IPISA has put greater emphasis on basic research rather than applied research.

(1) Research themes and their implementation plan

In Phase II, a Consultation Survey Team, dispatched from JICA in October 1990, discussed research programs with IPISA faculty members and worked out a TSI. Based on the TSI, a Five-Year Research Master Plan was drafted. But a revised TSI was worked out and according to that the five year Research Master Plan (1990-95) was finalised for timely implementation of the research program and for an allocation of the research budget from BARC to IPISA. The main research themes in each department are as follows (for more details see Annex 10):

a. Agronomy

- i. Tillage and stand establishment for upland and lowland crops.
- ii. Eco-physiology of crop production.
- iii. Weed management for upland and lowland crops.
- iv. Improvement of seed quality.

b. Crop Botany

- i. Comparative studies of growth and development of cucurbits.
- ii. Embryology of important upland and lowland crops.

c. Entomology

- i. Ecological studies of crop pests and predators.
- ii. Classification and taxonomy of crop pests and predators.

d. Horticulture

- i. Collection, evaluation, maintenance and utilization of horticultural germplasm in Bangladesh.
- ii. Improvement of horticultural production.
- iii. Biotechnology in horticultural plants.
- iv. Taxonomy, classification of horticultural plants in Bangladesh.
- v. Use of growth regulators in horticultural plants.

- e. Genetic and Plant Breeding
 - i. Practical approaches for improvement of plants in Bangladesh.
 - ii. Cytogenetical analysis of some crop plants.
 - iii. Mutation breeding.
 - iv. Improvement of dioecious and pulse crops.
 - v. Variety development of horticultural plants.
- f. Plant Pathology
 - i. Plant nematology.
 - ii. Plant virology.
 - iii. Fungal diseases.
 - iv. Plant bacteriology.
- g. Soil Science
 - i. Effects of manuring on physiological and chemical properties of soils.
 - ii. Water management of different crops.
 - iii. Physical properties and constraints of eight soils representing different regions of Bangladesh.
 - iv. Mineralogical studies of Bangladesh soils relating to soil potentiality and soil genesis.
 - v. Estimation of microbial biomass of eighteen soils representing different regions of Bangladesh.
 - vi. The effectiveness of nodule bacteria and their performance for nitrogen fixation in different legumes.
 - vii. Studies of soil microflora with special reference to nitrogen dynamic in Bangladesh.
 - viii. Evaluation and improvement of soil chemical fertility of upland soil.
- h. Agricultural Extension Education
 - i. The impact of agricultural technology and environment.
 - ii. The role of women in agriculture.
 - iii. Impact of selected farmer training programs.
- i. Agricultural Economics
 - i. Economic assessment of IPSA lablab bean varieties.
 - ii. Economic assessment of new crop varieties and other techniques developed by different technical departments at IPSA (e.g. Summer Tomato).
 - iii. Analysis of crop productivity and cost and return of different rice varieties and other important crops at farm level of IPSA.
 - iv. Study of the important components of farm household economy.
 - v. Outreach research programmes.

j. Agricultural Extension Education

- i. Assessment of the existing rice technology and their level and adoption by selected rice farmers of Gazipur district during Boro season.
- ii. Farmers' attitude towards high yielding variety of potato.
- iii. Understanding the agricultural extension system in Bangladesh and its effectiveness.
- iv. Technology transfer (factors responsible for accepting and rejecting the technology).

k. Statistics and Biometry

(2) Research management

IPSA research activities are managed by the Research Coordination Committee. Annually, each department prepares an annual research plan which is reviewed during a faculty meeting and by the Committee.

For strengthening and improving the management of research activities, IPSA has been attempting to introduce the computerized Bangladesh Agricultural Research Information System (BARIS) in close cooperation with the USAID expert. The system is expected to improve research planning, monitoring, evaluation, and budget allocation.

(3) Research output

Based on the TSI, a considerable amount of research activities have been conducted during the second phase in cooperation with the JICA and USAID experts. The followings are remarkable relative to the research findings/output of the faculty's research work.

a. Agronomy

- i. Physiological analysis for the establishment of high yielding cropping system.
- ii. Improved the methods to produce mungbean, rapeseed, wheat, cowpea, etc.
- iii. Research findings on the drying pattern of upland soil, flowering distribution of mungbean, hydraulic conductivity of upland soil, canopy structure of mungbean, planing geometry of maize, defoliation effects of maize and rapeseed, physiological characteristics of various upland crops, floral characteristics of mungbean, and seed technology information of crops augmented basic knowledge that will be useful for students and researchers world-wide.

b. Crop Botany

- i. Established virus infected okra contains less pigments.
- ii. Determined chlorophyll contents in various crops.
- iii. Developed propagation of *Momordica* and *Trichosynthes* through botanical seeds.

c. Entomology

- i. Recorded 3 field and 3 laboratory adult colour morphs of southern green stink bug, *Nezara viridula* L. for the first time in Bangladesh and included in the world list. They are: pure green (G-type = f. *smaragdula*), green with yellowish white band on the pronotum (O-type = f. *torquata*), green spots on yellow body colour (R-type = f. *viridula*), yellowish orange (Y-type = f. *aurantiaca*), yellow orange with whitish yellow band on pronotum (OY-type) and green spots on yellow body colour with whitish yellow band on pronotum (OR-type).
- ii. Hereditary basis of adult colour polymorphism in *N. viridula* L. was determined and the assumed genotypes are: G-type : a/a b/b; O-type : A/- b/b; R-type : a/a B/-; and OR-type : A/- B/-.
- iii. Seven common predaceous coccinellid beetles were identified and preserved in insect museum for references.
- iii. Forty-five species of predatory rice field spiders were identified and preserved in the museum. An illustrated monograph on rice field spiders of Bangladesh is going to be published soon.

d. Genetic and Plant Breeding

- i. Establish of grafting technology to control soil borne diseases on solanum crops.
- ii. Development of heat tolerance Brassica crops by cell fusion.
- iii. Isozyme analysis in rice protein for breeding of high quality rice.
- iv. Determined inheritance of different quantitative characters in tomato, wheat and other crops.
- v. Identified sources of male sterility in local onion cultivar.
- vi. Different species of *Momordica* and *Trichosynthes* species have been collected for cytogenetic studies.

e. Horticulture

- i. Released two lab bean varieties cultivable for the entire year. A few more are in the pipeline.
- ii. Developed lines capable of year round production that are awaiting release.
- iii. Developed early, mid-season and late lines that are awaiting release.
- iv. Worked on the development of new vegetable varieties.

- v. Worked out Photoperiodism in Lablab beans and fruit ripening.
 - vi. Preliminary work was done on tissue culture of papaya, rose, orchid etc.
 - vii. Methods of seed production and use of pollinators were investigated.
- f. Plant Pathology
- i. Plant parasitic nematodes associated with common crops in Bangladesh have been recorded.
 - ii. Major species of root-knot nematodes present in Bangladesh have been identified.
 - iii. Two fungicides suitable for control of purple leaf blotch of onion caused by Alternaria porii were noted.
 - iv. Furadan 3G and amendments of soil with cotton and mustard oil cakes were found to be effective materials to control of plant root-knot nematodes in potato.
 - v. Fungi associated with wheat grains during their development were recorded.
 - vi. The inoculum level of root-knot nematodes which causes economic damage to crop plants were noted.
 - vii. Determined development and life cycle of root-knot nematodes in jute and rice.
 - viii. Reactions of some varieties of potato, brinjal and jute to Root-knot nematodes were recorded. Root-knot and wilt resistant root-stock of tomato and brinjal were selected.
- g. Soil Science
- i. Determined moisture regimes required for cultivation of radish.
 - ii. Determined frequency of irrigation required for cultivation of brinjal.
 - iii. Effect of nitrogen application on the growth, nodulation and nitrogen fixation have been studied.
 - iv. Recorded effect of seedling age on growth and yield of brinjal.
- h. Extension
- i. Baseline study of villages surrounding IPSA.

IPSA faculty has been taking advantage of several opportunities to present and disseminate their research results to other scientists. An annual Research Review has been held in regular bases for presentations of research findings by IPSA faculty. Scientist from other research and educational institutions are also attend the Review. In the second phase, the review meeting were held two times, the first was held in December 1991 and the second was held in August 1993. Faculty members also give presentations in other professional meetings outside of IPSA.

The IPSA research journal, "The Annals of Bangladesh Agriculture" has been published with JICA assistance, for presentation of research results since June 1991. As of August 1993, Volumes 1, No. 1, No. 2, and Volume 2, No. 1 have been issued and Volume 2, No. 2 is also about to be published. IPSA faculty members have often contributed their research results to many kinds of domestic and international science journals. In the second phase, 87 papers were carried in the journals (see Table 11).

Research abstracts and IPSA journals which describe faculty research activities and their accomplishments in more detail are provided in separate documents.

(4) Manpower development and technical guidance of experts

In order to upgrade the research capabilities of IPSA faculty members, a number of JICA and USAID experts have been dispatched and have transferred a considerable amount of technical knowledge/know-how during the first phase. Similarly, in the second phase, JICA and USAID experts have continuously been providing guidance to IPSA faculty members to enable them to reach their full potential for high-level research. Among other things, this has included mastering of following:

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

These skills have been taught to IPSA faculty members through cooperative research with experts and training at IPSA, at Kyushu University, at Saga University, and/or at Oregon State University.

It must be noted 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, which is the highest society of scientists in the country. The research was done at Kyushu University while the faculty members were being trained there. The research had already been published already with co-authored with their instructors in 1990 and 1991 though.

Table 11. Number of journal publications published by IPSA faculty from 1985 to 1993
(From Five Year Master Plan 1990-1995)

Departments	In Journals			(Foreign journals)	Joint papers with experts
	1985 - 1986	1990 - 1993	Total		
Agricultural Extension and Education	4	20	24	(2)	(2)
Agricultural Economics	-	-	-		
Agronomy	16	3	19	(10)	(6)
Crop Botany	4	6	10	(0)	
Entomology	4	10	14	(3)	(2)
Genetics and Plant Breeding	23	20	43	(24)	(18)
Horticulture	9	11	20	(7)	(3)
Plant Pathology	16	7	23	(6)	(6)
Soil Science	2	8	10	(2)	(2)
Agric. Statistics and Biometry	2	2	4	(0)	
T o t a l	80	87	167	(54) 32.3%	(40) 25%

8.3 Academic program

(1) Introduction of New Course Based Curriculum

Compared with the Phase I, there have been remarkable changes in the academic programs of IPSA since August 1991. Specifically, a Ph.D. program has been offered by four departments (Agronomy, Genetics and Plant Breeding, Horticulture, and Plant Pathology). A new course-based curriculum has been implemented for M.S. and Ph.D programs. The position of Dean of Graduate Studies was established to provide leadership to the implementation of the new programmes. Needless to say, these accomplishments are the result of the continuing efforts made in Phase I.

The new graduate training programs are for M.S. and for Ph.D., respectively. The curriculum of course work is consisted with core courses (major and minor) and elective courses (major and minor). A credit is the equivalent of one lecture hour (50 minutes) or three laboratory hours per week for one term (12 weeks). Normally, one course has lecture hours or laboratory hours three times per week.

The M.S. program has a minimum of 42/46 credits, 30 for courses and 12 for thesis research. These credits are earned over four terms. Courses are usually taken during the first three terms, with the fourth term largely devoted to thesis research, analysis, and writing. The Ph.D. program requires a minimum of 75 credits, 45 for course work and 30 for dissertation research. These credits are earned over nine terms. At present, the Ph.D. program accepts only in-service students.

The implementation of the course based curriculum gave an impact to some other higher educational institutions of Bangladesh. Bangladesh Agricultural University (BAU) has also implemented a new course based curriculum in July 1993.

In spite of the serious shortage of IPSA's own faculty members, most of the core courses listed in the catalogue are offered for the students. Teaching duty has priority over other activities. Concerning with the elective courses, the number of the offered courses is sufficient at least to complete the degree requirement, but it is still not so many. For some of these courses, IPSA has made its syllabuses, but not yet for all of them. To carry out the courses, IPSA needs the aid of other institutions. Actually, many courses are taught by adjunct faculty dispatched from other institutions.

The number of the courses which were offered and are offered for the M.S. program in the last three terms (Nov. term 1992, May term 1993, Aug. term 1993) is shown in Table 12.

Table 12. Number of the courses offered in last three terms for the M.S. program

	core		elective	
	major	minor	major	minor
agril.economics	4 (5)	1 (2)	2	2
agril.extension	5 (5)	1 (2)	4	6
agronomy	4 (4)	2 (2)	4	8
crop botany	2 (3)	3 (3)	2	5
entomology	3 (4)	2 (2)	1	2
plant breeding	5 (5)	3 (3)	2	5
horticulture	3 (4)	1 (2)	2	4
pathology	4 (5)	1 (1)	3	4
soil science	3 (4)	3 (3)	3	5

() is the number of the courses which is required to complete the M.S. degree (Degree requirement may be changed on the recommendation of the Board of Studies)

IPSA plans to hold to an academic calender which has been established, and to date has been implemented as planned. The IPSA academic year begins in August of each calender year, and each academic year contains three terms. The academic calender initially laid out is shown in Table 13.

Program requirments, administrative procedures, test and grading procedures, courses offered and course descriptions are well articulated in the "IPSA Catalogue 1992 - 1993".

Table 13. IPSA Academic Calender

Term	Duration				
1	August	14, 1991	to	November	7, 1991
2	November	20, 1991	to	February	17, 1992
3	May	6, 1992	to	August	3, 1992
1	August	19, 1992	to	November	12, 1992
2	November	25, 1992	to	February	25, 1993
3	May	5, 1993	to	August	2, 1993

(2) The Students

a. Admission of students

IPSA is requiring its candidates rather high level achievement of their former education. Actually, to be admitted to IPSA, candidates must have obtained the first grade for all their certificates (Secondary Education, Higher Secondary education and Higher Education). The selection is made by an internal committee chaired by Dean based on opinions of each department. Arrangements have been made for admission of foreign students.

b. Statistics

Whereas more than 400 M.S. students studied at IPSA under BAU affiliation, since implementation of the IPSA's new curriculum, 175 students have been enrolled to M.S. programs in nine departments and 11 students have been admitted to Ph.D. programs in four departments by August 1, 1993. (see Table 14,15)

Among these students;

- i) 67 students are in-service (All 11 Ph.D. students are in-service)
- ii) 10 students are female
- iii) 93 students are continuing their study in IPSA
- iv) 27 students are deferring their study in IPSA
- v) 38 students quit their study

c. in-service students

One of the important role of IPSA is to provide the opportunities of higher studies for in-service trainees. Since the introduction of course-based curriculum, 64 students including 11 students of Ph.D. program have been enrolled in in IPSA. Half salary is given to in-service student. Recently, number of in-service students have been decrease (see Table 16).

d. Placement of the students

In February 1993, 7 students of the first class were graduated, and as of August 1, 1993, 28 students have completed their graduation requirements for the M.S. degree. Among the students deferred and graduated, 22 out of 55 students have joined agricultural research Institutions or extension department of the MOA. (see Table 17) .

To find a suitable job is not easy for the students. It is said that most of the reason for drop out relates to job opportunities. To date, IPSA has not been working for the placement of the graduating students.

(3) The Faculty

a. IPSA faculty

Currently, there are 22 faculty for 93 students in eleven departments. Due to the shortage of faculty members, in some departments, the teacher/student

ratio is rather high. In one department, there is not even one regularly appointed faculty member.

IPSA has its own recruitment rules and its criteria is very high. In fact, almost all the faculty either have a Ph.D. degree or have enrolled in a doctoral program. Besides, many of the IPSA faculty have the experience of post-doctoral studies in Japan (Table 5). IPSA faculty members also have an obligation of conducting research which will be reflected in higher quality academic programs of IPSA. Considerable amount of their research reports are published in national and international science journals. Recently, two teachers were awarded "The Best Scientist in Bangladesh." However, in some departments, faculty members are suffering from overload due to the shortage of manpower.

b. Adjunct faculty

The IPSA faculty is rounded out by highly qualified adjunct faculty from BARI, BRRI, BAU, DAE, Dhaka University, among others (See Annex 7, List of adjunct faculty). Their contribution is indispensable to the education of the students. IPSA has good relationships with these institutions. Some students do their research work at external institutions.

(4) Facilities

One of the major characteristics of IPSA's education is the member of laboratory hours. IPSA is presently the unique institute whose course work for postgraduate education of agriculture has laboratory hours. All departments except agricultural economics have their own student laboratory with a sufficient amount of equipment. Subject matter laboratories with complicated equipment are also available for the students. However, due to the weak preparation in general science, many students don't have enough knowledge and experience to handle scientific experiments.

A student computer laboratory equipped with micro computer is open from 8:00 a.m. to 10:00 p.m. The new library building which is 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 on campus for field experiments.

Since IPSA is located at a rather isolated place, the students can not find any shop nor any amusement facility around the institution.

(5) Activities of experts

In cooperation with an USAID expert, the curriculum of agricultural economics has developed and the department of agricultural economics was established in August 1992 as a supporting department, and has started to admit the students as a degree granting department in May 1993.

For the purpose of understanding the students' level/capability as well as providing the proper guidance of teaching methods, both JICA and USAID experts have handled courses works of the students. The experts also have been providing guidance and seminar relative to students' thesis research.

Text books have been also prepared mainly for laboratory course work in collaboration with the JICA experts. Two laboratory manuals for soil science and one text book for entomology have been published.

(6) Students' thesis research

Since IPSA aims at being a research oriented educational institution, the student thesis research is largely involved in faculty's research activities. As a result, students have been able to enjoy close guidance of faculty. Some of their thesis research has been published in science journals in joint name with faculty. A list of titles of the student research is provided in Annex 8.

(7) Financial support for students

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 provision for a scholarship program by an endowment fund of PL-480 monies is installed, however this program has not been operated yet.

Research assistantship has also been prepared in accordance with PP on IPSA and has been operated from May 1993. As of August 1, 1993, 24 students were benefited by the program. This research assistantship program will improve not only students' research skill and financial situation but also IPSA's research quality as well as quantities.

(8) Academic administration

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

Table 14. Number of the Students Enrolled and Graduated from IPSA under BAU Curriculum.

Department	1982-83		1983-84		1984-85		1985-86		1986-87		Total	
	Enr.	Grd.	Enr.	Grd.	Enr.	Grd.	Enr.	Grd.	Enr.	Grd.	Enr.	Grd.
Agric. Extension							4	0	4	3	8	3
Agronomy	30	6	32	6	39	14	14	1	10	10	125	37
Crop Botany	2	1	0	0	4	1	4	0	4	1	14	3
Entomology	6	0	11	2	16	2	10	2	3	2	46	8
Horticulture	15	9	8	5	21	3	9	2	5	3	58	22
Gen. & Pl. Breeding	21	7	26	7	31	13	12	4	9	9	99	40
Soil Science	3	1	25	4	23	5	8	5	8	5	67	20
Plant Pathology	11	2	10	1	26	4	9	1	6	6	62	14
Total	88	26	112	25	160	42	70	15	49	39	479	147

Enr. : Enrolled Grd. : Graduated

Table 15. The Number of Students Enrolled, Deferred, Dropped, Continuing, and Graduated from '91 to Aug. '93 Terms under IPSA Curriculum as of August 1, 1993.

Department	Aug. '91			Nov. '91			May '92			Aug. '92			Nov. '92			May '93			Total													
	E	Def/Drop	C	G	E	Def/Drop	C	G	E	Def/Drop	C	G	E	Def/Drop	C	G	E	Def/Drop	C	G												
Agril. Economics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	2	0	8	10	2	0	8	0							
Agril. Extension	6	0	2	1	3	4	0	1	2	1	4	0	1	3	3	0	0	0	1	0	0	0	18	0	4	10	4					
Astronomy	10	2	0	5	3	3	0	0	1	2	8	2	2	4	0	0	0	0	1	0	1	0	2	24	4	3	12	5				
Crop Botany	4	3	0	0	1	1	0	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	5	3	0	1	1				
Entomology	6	1	1	0	4	1	0	1	0	0	3	0	2	1	5	2	2	2	0	0	0	0	0	5	0	2	3	21	3	3	6	4
Gen. & Pl. Breeding	8	1	1	4	2	1	0	0	0	1	5	2	0	3	5	1	1	3	2	2	0	0	0	5	0	0	5	26	6	2	15	3
Horticulture	10	1	2	3	4	3	1	0	0	2	8	1	1	6	5	0	3	3	1	1	0	0	0	3	1	1	1	31	5	7	13	6
Plant Pathology	8	2	3	0	3	0	0	0	0	0	3	1	0	2	5	0	3	2	0	0	0	0	0	5	1	0	4	21	4	6	8	3
Soil Science	8	0	3	3	2	3	0	1	2	0	8	0	1	7	7	0	3	4	0	0	0	0	0	4	0	0	4	30	0	5	20	2
Total	60	10	12	16	22	16	1	3	6	6	39	6	7	26	32	3	12	17	5	3	1	1	34	4	3	27	186	27	35	93	28	

1. E: Enrolled, Def: Deferred, Drop: Dropped, C: Continuing, G: Graduated.

2. 67 students out of 93 students are in-service

3. 9 students out of 93 students are in Ph.D. programs (11 were enrolled), and all of them are in-service.

4. 8 students out of 93 students are female. (10 were enrolled)

Table 16. Number of MS and Ph D students by Departments of IPSA under new curriculum from August, 1991 to August, 1993

August 9, 1993

Department	Inservice Students						Fresh Students						Subtotal		
	1991		1992		1993		1991		1992		1993				
	Aug.	Nov.	May	Aug.	Nov.	May	Aug.	Nov.	May	Aug.	Nov.	May		Aug.	
Agriculture Economics	-	-	-	-	-	1	1	-	-	-	-	9	1	12	
Agriculture Extension and Education	3	2	0	1	1	0	1	3	2	4	2	0	0	22	
Agronomy	6	2	3	0	0	1	4	4	1	5	0	1	3	31	
Crop Botany	0	0	0	0	0	0	0	4	1	0	0	0	0	5	
Entomology	1	0	2	0	0	3	0	5	1	1	6	0	0	21	
Genetics and Plant Breeding	5	0	1	0	0	3	1	3	1	4	5	2	2	29	
Horticulture	6	0	3	1	0	1	3	4	3	5	5	1	2	39	
Plant Pathology	1	0	3	0	0	3	0	7	0	0	5	0	2	21	
Soil Science	0	0	1	0	0	3	0	8	3	7	7	0	1	34	
Sub-Total	22	4	13	2	1	15	10	38	12	26	30	4	19	18	
Total							67							147	214

Table 17. Placement of the IPSA Students Graduated and Deferred as of Aug. 1, 1993.

Department	Placement								Total
	¹ BARI	² BRRRI	³ BINA	⁴ DAE	⁵ MOE	⁶ NGO	⁷ Ph. D	⁸ In-sv	
Agril. Economics									
Agril. Extension						1	1	2	4
Agronomy	4			1	2			2	9
Crop Botany	2					2			4
Entomology				3	1				4
Gen. & Pl. Breeding	2	1				2			5
Horticulture	2			3		1			6
Soil Science	2								2
Plant Pathology			2						2
Total	12	1	2	7	3	6	1	4	36

1. BARI : Bangladesh Agricultural Research Institute
2. BRRRI : Bangladesh Rice Research Institute
3. BINA : Bangladesh Institute of Nuclear Agriculture
4. DAE : Department of Agricultural Extension
5. MOE : Ministry of Establishment
6. NGO : Non Governmental Organization
7. Ph. D : Enrolled Ph. D course in domestic or abroad
8. In-sv : In-service students

8.4 Outreach Program

Since the IPSA project started, the outreach program has been recognized as one of the most important components of the project as well as research and education program. In the Revised Project Performa, it is clearly stated that one of the objectives of the project is to disseminate innovations through training, workshops, publications, exhibitions, field days, etc. Also, there is a description in the Mini Project Paper that the project purpose will be achieved through completing the development of a community needs based institutional outreach program.

IPSA has an obligation to disseminate research results in an efficient manner. The purpose of the outreach program is to organize such activities. New technology and knowledge developed by research activities flows to the students and beneficial persons through outreach activities. In turn, a better understanding of the needs and recognition of problems faced by the target population requires feed back into the research and teaching system to strengthen and invigorate the research and search for knowledge.

In spite of the great expectation on the role of the outreach program, IPSA has concentrated its efforts in developing and expanding academic and research activities to give actual accomplishments as a education and research institution. Because of these priorities on the development process and the limitation in manpower, launching a full-scale outreach program has been set aside for the immediate future.

The midterm evaluation report(1989)for phase I indicated concern for the limited outreach activity at IPSA:

"At its present stage of development, IPSA has limited capability to implement an outreach program in a formal and well planned manner. The most serious bottleneck to implementation of a more extensive outreach program is a shortage of faculty. After removal of this bottleneck IPSA will be in a position to make more formal plans for implementation of an outreach program."

The report prepared by Dr. L.M. Eisgruber(1992), short-term Consultant on Curriculum, included the following discussion on the outreach program:

"There is no evidence that IPSA has come to grips with the issue and role of outreach in its program. Most departments are under the impression that they have no outreach responsibilities and that those responsibilities are entirely with the Department of Agricultural Extension Education. The Department of Agricultural Extension Education has not developed a comprehensive strategy for and IPSA outreach program, does not have a communicable vision of its role in it, and may not think it has the authority to do so."

It was obvious that the shortage of manpower at IPSA has caused significant negative impacts not only on the outreach program but also other aspects on development of IPSA. There were also other factors considered as a serious drawback to the development of outreach program such as lacking of consensus on a mission statement, nonexistence of a central committee, and lack of a realistic and explicit implementation plan.

However, since the Coordination Committee meeting, held in December 1992, decided that the mission statement on IPSA's outreach program should be developed and an implementation plan be formulated, there have been several informal discussions on the outreach program among faculty members and JICA/USAID experts.

Finally, the IPSA mission statement and implementation strategy were developed through a faculty workshop on O&E program and have proposed to IPSA by Dr. Youngberg, the USAID short-term experts in June 1993. At present, the faculty and administration are examining this proposal prior to its active implementation.

Since establishment, IPSA has conducted a number of activities that can be categorized as outreach programs. These include the following:

1. Baseline studies of community as a basis for outreach activities (by the department of agricultural extension education) 1990 - 1992
2. Cooperative agreement with BARI and BRRI 1990
3. Annual Research Review 1991 & 1993
4. Publication of "Annals of Bangladesh Agriculture " 1991
5. Contribution of research report for research journal Continuing
6. Computer workshop in "Statistics & Biometry" for research worker 1992
7. Bangladesh Science Conference 1992
8. Workshop on "Research and Development of Vegetable Crops" 1993
9. Training course on "Role of Anthropology in Agriculture Research" 1993
10. Cooperative agreement with Jomo Kenyatta University College of Agriculture and Technology (JKUCAT), Nairobi, Kenya 1993
11. Cooperative agreement with BAU 1993
12. Cooperative agreement with Department of Agricultural Extention (Being actively considered by both parties)

Although these activities can be classified as outreach programs, they were really not part of conscious or planned outreach activities. Efficient impact can not be anticipated without certain specific planning of outreach activities. IPSA faculty members have to reach formal consensus on the mission statement as early as possible.

9.0 SUSTAINABILITY AND END-OF-PROJECT STATUS

A major issue which must be addressed in the design and implementation phases of any development project is the question of sustainability. Obviously if an institution/project is not sustainable after the departure of the donors the waste in terms of manpower and funds is prohibitive. Additional negative issues relate to the impact on the local environment as well as future relations between the relevant donor/development partner and host country. The IPSA project must be subjected to the same examination criteria as other development projects.

The most relevant definition and criteria of sustainability of the IPSA institution was discussed in December 20, 1992 meeting of the Coordination Committee. The definition was recorded in the "Minutes of Discussions Between the Technical Guidance Team and the Institute of Postgraduate Studies in Agriculture on IPSA Project Phase II". This document was signed by Dr. Ekramul Ahsan (Director/Rector, IPSA, Ministry of Agriculture, Bangladesh) and Prof. Dr. Ichiro Goto, Leader, Technical Guidance Team, JICA, Japan) on December 23, 1992.

The 1992 definition and criteria was stated as follows:

"Sustainability, it was agreed, is not the immediate objective of the Project but is the result of the Project which can be evaluated after termination of the Project. Sustainability, therefore, will be gained through Project activities and continuous effort by the Government of Bangladesh. In short, the purpose of the Project is to achieve the certain targets that lead toward the goal, sustainability."

Briefly, the definition can be summarized as being interpreted as meaning that IPSA sustainability will be successful if IPSA becomes an institution that can continue to fulfill its essential tasks with its own resources and with sufficient domestic support without the need for external assistance. The key to this sustainability is a strong and continuing commitment on the part of the Government of Bangladesh. Specifically the issues (see Table 1 for overall review) which must be addressed if sustainability is to be realized are the following items:

(1) Autonomy and status of IPSA is important for in order to be truly sustainable and to attain Project goals, autonomy with full academic degree granting authority is an essential condition. At this point, almost all concerned authorities, including the Minister of Agriculture, have said that IPSA must receive the approved Ordinance/Act as soon as possible.

(2) Government of Bangladesh funding is a requirement relative to the sustainability issue. Even after IPSA becomes an autonomous degree granting institution, quality activities cannot be expected without regular and permanent funding from the GOB. In the approved PCP/PP there is provision for operational expenses after 1995. This decision/recommendation is critical

and if the institution is to be sustained. In order to accomplish this provision, the necessary paper work/approvals must be put into place and ready for implementation at least 12 months prior to the project termination date (July 3, 1995).

(3) The availability of students is important for the life of the institution as the "pipeline" must have continual incoming students. Very simply, the institution will not be able to continue if there is not a supply of students to participate in the academic and research programs. Other GOB and National Research organizations should be encouraged to increase academic requirements for employees while at the same time creating an environment which would help employees attain degrees or degree enhancement academic experience through in-service programs.

The employment market is important in terms of the number of students who will enroll in the institution. Since that particular variable is beyond the control of IPSA one can only call attention to it as a factor to consider. Other non-controllable variables which may impact the number of students includes the lack of a PhD degree requirement as a condition of employment and the amount or lack thereof of salary increases for in-service students as they complete academic programs and return to their work positions.

One source of students at the present time are the in-service students. In order for that number to continue to grow there must be incentives for in-service students to attend IPSA instead of opting for foreign study sites. Scholarships which are at a sufficient funding level (3000T for PhD students) would be an incentive for some students to stay within Bangladesh to complete their degree programs. The program at IPSA should have a program which is comparable to training incentives for students when they participate in training programs outside of Bangladesh. Other incentives for students include married student housing on campus as well as transportation to civic centers and school sites for children.

(4) The organization and administration of the institution must be efficient and must result in a well functioning organization. The administrative and financial offices of IPSA are the key figures in the supporting function for the faculty and staff. They must understand their role and organize for the unique management role which is necessary in an educational institution. The computerized Information Management System which the OSU team is now installing will be helpful but only if the IPSA personnel avail themselves to utilize the system.

It is essential that responsibilities be vested in the offices which are closest to the relevant problem. In other words, it is important for departments, divisions or committees to have clearly defined responsibilities for work within their areas. With the responsibility assignment, authority must also be given. Just as autonomy is important to the institution, some autonomy is also important to the different units on campus.

(5) Essential to the sustainability of a Center of Excellence (which is the expressed aim of IPSA) is the quality of

the personnel. The best quality manpower will achieve the best quality results. Manpower development, which includes training, recruitment and monitoring are preconditions to the establishment of a high quality research, instruction and outreach program.

(6) Institution to institution linkages are important if a research institute strives to be on the cutting edge of technology. Communication, collaborative and sharing are the key words in any highly professional linkage program. Linkages with other associated institutions with similar goals are important as IPSA's academic programs mature. IPSA should continue present linkages and should consider, in a timely manner, other linkages with institutions in the areas of research, instruction or outreach. Creative linkages could result in benefits to both IPSA and their linkage partner.

(7) Adequate and well maintained infrastructure is of prime importance when sustainability is reviewed. Appropriate physical facilities are necessary for research, instruction and outreach activities. Timely and planned maintenance is vital in order to keep the equipment in workable condition. Planning and training for proper maintenance of buildings and furnishings is also important for a safe, efficient and attractive campus and institutional program.

In summary, sustainability is possible for IPSA if the Government of Bangladesh continues support for the institution as a center of excellence. This support must include funding while allowing autonomy for the institution.