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NEPAL
PROGRESS REPORT

For the Period
1 July, 1983 to 31 December, 1983

DEVELOPMENT OF IAAS

Project 367-11-110-102
Contract AID/NESA-C-1197

AGENCY FOR INTERNATIONAL DEVELOPMENT

IN COOPERATION WITH

MIDWEST UNIVERSITIES CONSORTIUM FOR INTERNATIONAL ACTIVITIES, INC.*

*Members are: University of Illinois, Indiana University, University of Iowa,
Michigan State University, University of Minnesota, The Ohio State
University and the University of Wisconsin.

The Format of this report is that of the Specific Work Plan developed by the current Technical Assistance Team, a copy of which is reproduced as Appendix 1. This Specific Work Plan is an adaptation of the Project Work Plan developed by Kim A. Wilson and Andrew D. Sofranko in June, 1982 for the period remaining under the present AID/MUCIA contract.

This report indicates the progress made to the end of the 1983 calendar year under each segment of the specific work plan and gives some appraisal of what remains to be accomplished before September 30, 1984.

Some changes have recently been made in departmental structure of IAAS; there are now 11 departments where there previously were 7. Thus two advisors work with additional departments than those when the work plan was developed. Generally, however, the same IAAS faculty members are involved even though they may now be administratively in another department.

The departments at IAAS at the present time and current chairmen follow:

<u>Instruction Committee</u>	<u>Chairperson</u>
1. Plant Protection (Entomology, Plant Pathology, Zoology & Fisheries)	Prof. F.P. Neupane
2. Soil Science and Chemistry	Lect. P.P. Sharma
3. Ag. Botany	Lect. S.B. Gurung
4. Ag. Statistics and Mathematics	Asst. Lect. G. Uprety
5. Ag. Engineering and Physics	Asst. Lect. R.B. Chhetri
6. Humanities (Nepali, Nepal Studies and (English)	Asst. Lect. H.R. Dulal
7. Ag. Economics	Lect. G.P. Shivakoti
8. Horticulture	Lect. R.R. Adhikari
9. Agronomy	Lect. U.S. Gupta
10. Animal Science	Lect. K.R. Tiwari
11. Rural Sociology and Extension Education	Lect. N. Kunwar

I. TECHNICAL ASSISTANCE

A. Plant Science Advisor (P) Marlowe D. Thorne

The Plant Science Departments now include Agronomy, Soil Science and Chemistry, Ag. Botany, Horticulture, and Plant Protection. The job description remains unchanged from the specific work plan writeup.

B. Animal Science Advisor (A) Weslie Combs

There has been no change in departmental responsibility nor in job description since the specific work plan writeup.

C. Rural Development Advisor (R) Herbert L. Whittier

Because of a change in departments, the Rural Development Advisor now works with the Department of Agricultural Economics and with the Department of Rural Sociology and Extension Education. The job description remains unchanged from the specific work plan except that he has also taken on responsibility for supervising maintenance of MUCIA vehicles, both automobiles and motorbikes, and assists with maintenance of IAAS vehicles.

D. Short-Term Consultants

1. Statistics and Research Design (A)

Dr. Charles Cress, Professor, Department of Plant and Soil Sciences, Michigan State University, accompanied by his wife, Joan, conducted a six-week short course from 27 July through 12 September, 1983. P.P. Sharma, Lecturer in Soil Science assisted Dr. Cress materially in the arrangement and conduct of the short-course.

2. Communication and Audiovisual Specialist (R)

Not yet completed; specialist not yet selected nor date set for assignment. We are awaiting the arrival of the remainder of the audio-visual equipment ordered so that the advisor will be able to provide hands-on demonstration and training with the materials. One specialist has been contacted about possible assignment and dates of availability. In the meantime, we have been refurbishing a communications center (Agricultural Communications Services Center--ACSC) in preparation for the arrival of the additional equipment and have been working on developing the infrastructure and staffing of the unit.

3. Laboratory Equipment Specialist (P)

David P. Krauss, Instructor, Department of Crop and Soil Sciences, Michigan State University completed this work during his assignment at IAAS July 7-Sept 9, 1983. He completed the inventory of equipment which MUCIA has provided IAAS as well as that purchased directly by IAAS. He repaired 16 pieces of laboratory and audiovisual equipment, sent two pieces to Kathmandu for repair. Some units were not repairable or were without schematic diagrams. Departmental meetings were held to instruct faculty on maintenance

and repair of equipment. He also worked with some equipment at the Maize Center. The learning center was set up in the library so that it was operational at that time. A list of 16 recommendations was included in the report concerning laboratory equipment and 7 recommendations concerning the audio-visual center and 7 concerning the equipment for various IAAS departments. A copy of the short-term report containing the inventory of equipment has been furnished to each IAAS department.

4. Specialist in Training of Trainers (R)

This course, now to be titled "Effective Classroom Instruction" will be offered at IAAS March 11-April 6, 1984 by Dr. Colleen Reid Cooper and Dr. Carroll H. Wamhoff of the Department of Agricultural and Extension Education of Michigan State University. The advisors will utilize the video equipment ordered for IAAS if it arrives on campus in time to do so. IAAS chairpersons have nominated 58 faculty members to attend the short-course.

5. Library Science Specialist (A)

Prof. John Beecher, Public Service Librarian, College of Agriculture, University of Minnesota, was on campus for two weeks in November 1983, his second tour as library consultant. Prof. Beecher expressed satisfaction with the progress of the library collection and the competence of the librarian, Mr. Devkota. He met with the faculty library committee and discussed problems of interest to them. He presented a common sense approach to resolving the special problems of the IAAS library. The Animal Science Advisor accompanied Prof. Beecher on an inspection of the library, Paklihawa campus, and a number of libraries in Kathmandu. The Paklihawa library is a single room with a very small book collection. Some agricultural volumes have been received from the British Embassy, Kathmandu.

Attendance at the conference of HELLIS (Health Library and Literature Service) and visits to libraries at Institute of Forestry, APROSC (Agricultural Project Services Centre), RECAST (Research Center for Agriculture, Science and Technology), and ICIMOD (International Centre for Information on Mountain Development) revealed many small overlapping collections being supported by different donor countries, each in the planning stages or early development of computer capability with little or no coordination of computer or catalogue systems. Of these, APROSC is the largest library and the most advanced in cataloguing, microfilming, and computerization.

6. Experiment Station Management Specialist (P)

Not completed. This is still under consideration by IAAS and MUCIA. It is doubtful that much progress can be made

on land development before the end of the current contract. IAAS funds for this purpose have apparently been lost for this year because of a clerical error at Tribhuvan University. MUCIA funds are being utilized for such development activities as repair of buildings at the North Farm, development of a well and some plot fencing for horticulture, relocation of an access road to the North Farm. It is possible, but unlikely, that a specialist in land shaping and drainage could be utilized. Training of a farm manager will have to await the appointment of an overall manager of IAAS farms.

7. Extension Communications Specialist (R)

Not completed. Position will be combined with (2) above.

8. To be determined (P)

H. James Miller, Professor of Architecture, University of Illinois at Urbana-Champaign, served a one-week assignment in October, 1983 to consider development of a campus plan for IAAS. Mr. Miller had been here a number of times between 1974 and 1978. He indicated that he could prepare a master plan which could guide the building program for many years to come. Implementation of his proposal is beyond the scope of the current project. The first step, however is to secure the services of an academic planner.

IAAS has requested that MUCIA provide the services of a short-term consultant in academic planning. Recruitment is underway with an estimated time of service here as mid-1984.

II. TRAINING

A. Short-term Training

1. Course in Nepal

1.1. Design and Analysis of Agricultural Experiments:

38 faculty members of IAAS and the Maize Center enrolled. Twenty received certificates of "Satisfactory Completion". Six who attended lectures but did not complete the assignments received certificates as "Participants". The course was taught by Dr. Charles Cress, as indicated under ID1 above. The course, and particularly Dr. Cress' teaching style was well received by participants though course content was a review for nearly all. A few faculty members availed themselves of Dr. Cress' consultation on design of their own research programs. Content of the course included more detailed analysis and less philosophy of research aimed at assisting in the selection of appropriate areas of investigation than had been envisioned in the work plan.

Each participant submitted a research proposal as a course assignment. One commendable research projects was presented by a participant in a seminar and others were scheduled. Severable able statisticians at IAAS emerged from the course. One is now teaching an undergraduate course in statistics until a permanent instructor can be appointed.

1.2. Training of Trainers (R)

This course is now scheduled in the near future as indicated under ID4 above. The course has been renamed to Effective Classroom Instruction and 58 participants have been nominated.

1.3. Audio-visual Training (R)

The training is to be accomplished by ID2 above, a short-term advisor.

2. Training for Administrative Staff of IAAS (P)

Two administrative staff members are to go to India under direct AID financing. A proposal has been received from Dr. Rogelio Cuyno of UPLB for training. The cost exceeds that budgeted by \$16,000. It is still under consideration by IAAS and MUCIA.

3. Overseas Training Course for Academic Faculty of IAAS (P)

10 faculty members were sent for short-term, non-degree training in specialized subjects. Nine attended USDA short course and one attended a special training course at Michigan State University.

Three faculty members were sent to a short course on wheeled tool carriers at ICRISAT, India. Four faculty members were provided travel expenses to professional meetings in the region; two were provided travel in the U.S. in connection with their travel there under other auspices. Another faculty member will soon be sent to Israel to a professional meeting.

Non-MUCIA/AID funded training included:

1. Resham Thapa (FAO) for 6 months training in sericulture in China.
2. Pradeep Tulachan (IDRC) to a seminar on "Socioeconomic Aspects of Livestock" in Singapore.

B. Study Tours for Academic Staff

1. Mediterranean Livestock Study Tour (A) June 3-27, 1983

M. Sapkota, N. Shah, J.L. Yadav (Paklihawa), Lecturers in Animal Science, B. Panta, Lecturer in Plant Science, and B. Pokharel, Lecturer in Agriculture Economics, accompanied by the Animal Science Advisor, toured sheep and goat dairies in Cyprus and Greece and buffalo dairies and a Chianina cattle herd in Italy. Also visited were the Agricultural Research Institute, Cyprus, University of Thessaloniki and other Centres in Greece and FAO headquarters, Rome.

Results of the tour have been written reports and an illustrated seminar by participants; initiation of ear tagging and tattooing of IAAS livestock by N. Shah, then Farm Manager; and initiation of importation of Damascus goats and Greek Chios milk sheep from Cyprus. The tour introduced participants to an array of multi-purpose livestock systems between the undeveloped systems of the Indian sub-continent and the high technology systems of North America which were largely the limits of previous experience of participants.

It was arranged for B.K. Sharma, Assistant Lecturer of Animal Science, to visit University of Thessaloniki, and the Greek Ministry of Agriculture Milk Sheep Improvement Station, Aghios Mamas, and Artificial Insemination Centre, Diavata, en route home following completion of his M.S. degree in Dairy Production, South Dakota State University.

2. Rural Development Study Tour to Indonesia (R) June 1-29, 1983

Five IAAS staff members and the R.D. Advisor toured Thailand, Indonesia and Singapore. The focus was on university development and integrated rural development. Tour members were: Dean B.P. Sinha (Administrative and Extension), Assistant Dean Dr. Kailash Pyakuryal (Rural Sociology), Mr. Santa Man Shakya (Horticulture), Mr. Bhairav Khakural (Soil Science), Mr. K.T. Augusthy (Fisheries), Dr. Herbert L. Whittier (R.D. Advisor).

In Thailand the group visited Katsetsart University; ADC, UNDP and A.I.T. In Indonesia, 6 agricultural universities and several development projects were visited. Country-side tours allowed participants to observe integrated rural development in action. In Singapore participants visited IDRC regional headquarters.

The tour was extremely successful; tour reports were completed by all participants and a seminar was presented to the IAAS faculty by all participants except Mr. Augusthy who had left for IDRC-funded graduate study in Canada.

3. Plant Science Study Tour to India (P)

A tour is currently being planned to visit five agricultural universities in India as well as the Indian Council of Agricultural Research in Delhi. It is contemplated that 7 or 8 IAAS faculty members will go in addition to the Plant Sciences Advisor.

C. Administrative Visit to MUCIA Universities (P)

Dean Sinha plans to visit a small number of U.S. Universities sometime before the end of the contract. Negotiations with World Bank and AID regarding project renewal have made scheduling difficult. It is hoped that the visit may be arranged in June at the close of the tour of duty of the Plant Sciences Advisor so they can travel to the US. together.

D. AID Financed Training Program in India

Participants have been nominated for 1984-85; they are currently seeking admission to appropriate universities. Two staff members have been nominated for non-degree administrative training.

E. Advisors Comments regarding Training

We believe the most cost effective short-term training the past year has been the short course offered on campus with an ex-patriate instructor accomodating 20 or more participants for essentially the cost of sending one or two participants abroad. USDA short-courses are the most expensive. They are popular, mostly because of the high monetary allowances specified. Participants were reportedly able to accumulate the equivalent of at least one year's salary by living frugally while in the U.S. A few USDA participants have written reports and a few have given seminars about their experiences. The two study tours completed have cost less per participant. Participants finally reported in writing and by seminar six months after tours were completed. Settlement of expenses of participants is not complete.

The two advisors who led tours believe them to be effective training in their subject-matter areas. The animal science advisor and the rural development advisor report that participants were exposed to an array of new concepts and practices and that specific actions have resulted from the tours. No specific actions are yet apparent as a result of the USDA short courses.

We believe that training outside Nepal in short-courses should be limited and that participants should be carefully selected to meet specifically identified needs of IAAS and not as rewards or incentives for faculty members. Future training outside Nepal should be planned carefully to fit manpower and staff development needs at both the departmental and Institute levels. Participants must be selected on the basis of qualifications in the area of training, and the record of performance of the individual. The attitude now seems to be that everybody should have a chance to go somewhere, and the type of training or the performance of the individual is of little consideration. Resources are too scarce and needs too great for this to be the basis of selection for training. Future tours should have written agreement of participants to make a written report and to give a seminar within a specified short period of time after return. Exact details of funds to be provided by MUCIA to each participant should be specified in writing and agreement signed by each one before departure.

III. RESEARCH PROGRAMS

A. Plant Science

1. Water Management for Crop Production

One project to evaluate the effect of dew on winter wheat production has been completed but not yet reported. It was not repeated because the principal researcher was away for training at wheat planting time.

2. Development of Cultural Practices of Field and Horticultural Crops

2.1. Screening of germ plasm for selection of cultivars with potential for high yield under Nepalese conditions in cooperation with national programs in important crops.

One project has been initiated on screening of tomato germ plasm for disease resistance. It is not in cooperation with any national program. No studies have been initiated on crops with on-going national programs.

3. Nursery Management for Horticultural Crops and Improved Landscape Design and Maintenance

Plans are under way to provide more land for horticulture and to provide a well to permit irrigation of limited areas. Assistance was provided by MUCIA for obtaining of plant material of citrus in the eastern zone of Nepal.

4. Improvement of Integrated Post Management Programs

Equipment has been ordered for the department, which will facilitate improvement of programs. Field facilities are in planning stage.

5. Nursery Management Practices

Covered under (3) above.

6. Seed Quality Studies

A seed cleaner has been received but remains in MUCIA storage despite a number of promises to get it moved and into operation. Evidently suitable space is not available for it. Additional equipment is on order for seed studies, and for teaching of seed technology. An elective course is now in operation.

B. Animal Science

1. Forage Evaluation

Project #20. *Leucaena leucocephala* (K.R. Tiwari, Project Leader, and S.D. Sah, Animal Science; B.R. Khakural, Soils; R. Koirala, Horticulture; Helmich van Rees and Anne Waanders

(Dutch students, Royal College of Tropical Agriculture); and W. Combs, MUCIA Advisor). Planting of 1 ha of some 15000 leucaena leucocephala fodder/wood trees has been the most significant achievement. Leucaena is a tropical legume of exceptional growth for the production of either wood or forage capable of producing 10-20 tons of dry forage per ha per year with about 25% crude protein.

Six varieties, K-8, K-28, K-67, Salvador, Cunningham, and Nijgadh (Nepal) are being compared in two planting configurations. 6,480 trees were planted on 1m x 1m spacings with cuttings to be made at 12 and 6 months intervals for forage and wood and frequently for forage alone. Some 9,000 have been planted in hedgerows one metre apart with 5 plants per meter within the row for forage only. Total planted area is about 1 ha. Four of five varieties were partially direct seeded with considerable success. Because planting was not completed until the end of monsoon, first substantial cuttings will be in spring and summer 1984. The project utilizes for the first time the banks of the watercourses on the North Farm for other than natural grasses. Another 4 ha remains for continued planting before 1984 monsoon. Intercropping with pineapples and other crops is being planned in cooperation with the Department of Horticulture. The planting of Leucaena on the watercourse banks is the first step toward removal of forage crops from the arable lands in favor of food crops.

The work of Anne Waanders and Helmich van Rees, students from Rijks Hogere Landbouwschad Deventer met Tropische en Nederland Afdeling (Royal College of Tropical Agriculture, Deventer, The Netherlands) in conducting seed germination trials and growing 20,000 seedlings is acknowledged with special appreciation. Their initiative, industry, technical knowledge, and high level of self-direction was exemplary.

M. Sapkota, Animal Science, has initiated an agro-forestry project including some fodder trees in collaboration with the Institute of Forestry, Hetauda, and funded by IDRC (International Development Research Centre, Ottawa, Canada).

2. Feeding of Crop Residues

2.1. Concentrates

Project #17. Substitution of mustard cake for soybeans in swine rations (M. Sapkota, Animal Science, Project Leader; and Eugen Driessen, student, Royal College of Tropical Agriculture). This project was completed in mid-December and is being analysed. Eugen Driessen assisted with the project and conducted feed analyses initiating operation of previously unused laboratory equipment. Feeding and watering equipment developed by

Mr. Sapkota were exhibited at the National Science and Technology Exhibition, Kathmandu, winning a Rs 1,000 Honourable Mention Award.

Ten Kg of mustard cake has been collected for the doctoral research of Nanda Joshi on amino acid content of Nepali mustard cake. Mr. Joshi is a Lecturer in Animal Science, currently at Michigan State University. A previous shipment was lost and difficulties are being found in transmitting the replacement to the USA.

2.2. Roughages

One proposal submitted was rejected by the Research Committee. It is planned to combine roughage testing with testing of biogas slurry.

3. Biogas Residues

The biogas plant has been completed and is ready for loading. Feeding trials may be possible by April 1984.

4. Breed Evaluation

4.1. Goats

Plans for the importation of Damascus goats have been initiated and the flock of local goats is to be expanded.

S.K. Sah, Assistant Lectuer in Animal Science and MUCIA participant, is investigating reproduction in goats for his M.S. research, University of the Philippines, Los Banos.

4.2. Sheep

Plans for the importation of Chios milksheep have been initiated and the flock of local sheep is to be expanded.

4.3. Poultry

1,000 New Hampshire Red chicks and 200 ducklings have been acquired for commerical production and 500 Shavor Starcross hybrid chicks were acquired which may be useful in genetic studies. Two poultry buildings funded by IAAS have been completed but due to the small allocation of funds and over-sights in design, useable floor space is about 50% less than expected. MUCIA is funding the modification of an existing building to accomodate pigeons and guinea fowl until more adequate facilities are prepared. Outdoor poultry runs partitioned with synthetic bird netting are planned.

M. Kharel, Assistance Lecturer in Animal Science and MUCIA participant, is conducting his M.S. research in duck breeding at University of the Philippines, Los Banos.

5. Milk Characteristics and Processing

5.1. Project #21. Milk composition among Hariana cows and Murrah buffalo (Nagendra Shah, Animal Science, Project Leader; and Eugen Driessen). This is the first systematic milk testing in the IAAS herds in some years. Eugen Driessen assisted with laboratory analysis.

5.2. Evaluation and Characterization of goat and sheep milk for cheese, yoghurt and cheese has not yet been initiated and will likely not be until after the importation of the Damascus goats and Chios sheep.

6. Integrated Fish-Animal Production

Project #1. Fish-cum-duck. The fish ponds begun in 1982 were completed and stocked 9 September 1983 with Indian and Silver carp fingerlings from the Ministry of Fisheries, Hetauda. Following the departure of K.T. Augusthy for a Ph.D. program at McGill University, Montreal, a series of three temporary fisheries experts have followed. While each contributed to the fish project, lack of continuity has resulted in lapses in the amended research plan adding to the difficulties due to serious defects in pond layout, and design, pre-dating the present MUCIA team. Specifically, the digging of the ponds into the ground instead of building them above ground makes impossible the control of water quantity and quality. Draining the ponds for necessary drying is impossible. Differences in algae development are apparent among the ponds.

In addition, the shape and excessive depth of the ponds make removal of fish using conventional nets difficult if not impossible. Sample weighing of fish to evaluate their growth has not yet been achieved due to lack of suitable nets.

The original research proposal to test different and unreplicated variables in each of the four ponds was to have been modified to treat all ponds equally to test their relative fish production capacity. Unfortunately, different treatments were at last applied to each pond, though not those originally proposed, making interpretation of results impossible.

This has been by far the most expensive research project absorbing more than 30% of research funds thus far expended with virtually no likelihood of ever yielding interpretable research information. The unsuitability of the ponds has been cited by prospective candidates

for the fisheries post as a reason for their disinterest in coming to IAAS.

Integration of ducks with the fish is not possible because the duck facility was located apart from and too high above the ponds for practical use.

The animal science advisor and the MUCIA team leader met with the Dean, IAAS and concerned faculty members at the site when it became evident that construction was beginning. Arguments against construction of the ponds on the proposed site in the proposed manner were to no avail. Funds had been committed by the previous team leader in spite of advice against the location by the animal sciences advisor in 1982 when he was at IAAS on short term assignment and advice against the location when he returned for long-term assignment. IAAS decided to proceed with construction and funds were transferred to pay costs as had been committed.

7. Animal Traction

Two sets of wheeled-tool carriers have been ordered. Three faculty members were sent to ICRISAT for training in their operation.

C. Rural Development (R)

In the specific work plan 6 current and projected projects were mentioned. There is activity in all 6 projects, and three are almost completed. A review follows:

1. Radio and other sources of information to the farmers in Chitwan District (MUCIA funded, Narayan Kunwar, principal investigator). All data have been collected and coded; currently the data are being tabulated and interpreted; the draft report is being written now and the investigator expects to complete the project within one month (by the end of March).
2. The evaluation of the B.Sc. Agriculture Program at IAAS, Rampur Nepal. (MUCIA funded, Bholu Pokharel, principal investigator). When specific workplan was written, the only activities on this project had been the writing of the original proposal. Since then, the proposal has been rewritten, questionnaires devised for graduates, employers, and subordinates and mailed out. A list of graduates and their addresses has been obtained for over 50% of the graduates and half of these have been interviewed by the investigator. Project is progressing with great speed, urged by the necessity of the data for on-going curriculum at the Institute. Expected completion is approximately 2 months.

3. A Study of Farming Systems : A Case Study of Sharadanagar Panchayat. (MUCIA funded, Pradeep Tulachan, principal investigator). All data have been collected and analyzed; draft report has been submitted for typing; completion is expected by March.
4. Continuous research and evaluation of IAAS Pilot Extension Project. Previous Extension Coordinator, Pradeep Tulachan, and R.D. Advisor have developed questionnaire for Socio-economic baseline survey of pilot extension area; detailed land maps have also been obtained. Now the Extension in-charge and the extension team with the R.D. Advisor will conduct the survey during month of March and produce a summary report in April (funding through MUCIA extension budget). With the survey complete, it will be possible to conduct more restrictive but statistically sound sample surveys on other matters of concern to the extension group and IAAS researchers. These studies will be defined after the survey is complete.
5. Assist in the development of new research projects with the Rural Development Division.
 - A. Major effort was devoted to formulating a proposal to study communication problems with agricultural information. Major investigators include G. Shivakoti and a representative of Radio Netherlands. Proposal complete; awaiting news of funding from Netherlands government; co-sponsors, Radio Nepal and ITRC (UNDP-Bangkok), have already provided approval.
6. Research in the area of women's roles in agriculture in the Terai. Formal study in this area has not yet occurred, but the advisor is preparing to conduct a mini survey with the 15 IAAS women students. Under the Student Work Experience Program, Dr. Kailash Pyakuryal will be directing the research of 12 students into the problems of rural women.

IV. TEACHING PROGRAM (P/A/R)

1. Preparation of syllabi and/or testbooks for assistance to teachers and guidance to external examiners. One laboratory manual has been submitted by two members of the Soils Department. It has been reviewed and is being revised and enlarged to include additional laboratory exercises. An honorarium will be paid by MUCIA upon its final acceptance and MUCIA will assist in its publishing.

The animal science advisor prepared a syllabus for a course in sheep and goat production.

Other faculty have not yet responded to the request and offer of honoraria, despite encouragement by all advisors and by IAAS administration.

2. Development of course outlines to define course objectives and to reflect accurately what is being taught.

Some course outlines are reportedly in draft form. There continues to be confusion as to what constitutes a course outline. Some faculty think that the brief course descriptions qualify.

The IAAS curriculum for the 5 year B.Sc. degree has been revised and will be presented to the Faculty Board for approval. The R.D. Advisor has reviewed all materials prepared by the Ag. Econ. and Rural Sociology faculty such as student handbooks for courses which include new course outlines with major and minor course objectives defined and a sequential listing of course topics.

3. Development of elective courses to permit some specialization and pursuit of special interests and talents.

Only two or three elective courses are permitted and only in the final year. All electives must be taken in the same department to give some specialization. Most departments have developed elective courses and the teaching of those offered this year is now under way. The animal science department specified that one of the electives must be ANSC 1521E Animal Health. They term this a "compulsory elective". Of four other electives offered, only two attracted enrollment; Swine & Poultry, and Sheep and Goats. Agricultural economics began teaching all of the listed elective courses this year and added one new staff member to help with the load. Rural Sociology and Extension will not offer electives this year due to insufficient staff. The courses have been prepared for offering next year.

4. Arranging of seminars concerned with teaching improvement, evaluation of teaching, and related subjects.

The plant science advisor gave a seminar on faculty evaluation which included teaching evaluation. A committee developed a guide for faculty evaluation including teacher evaluation. The short course, "Effective Classroom Teaching", soon to be given on campus under MUCIA auspices will directly address this matter.

5. Encouragement and assistance in developing at least ten textbooks for use in IAAS courses. Financial incentives will be offered from MUCIA funding.

No textbook manuscripts have yet been offered. The R.D. advisor has given special encouragement to faculty members to develop a textbook in Agricultural Strategies to be used in a course by the same title.

V. EXTENSION ACTIVITIES (R)

MUCIA Advisors will assist IAAS faculty and administrators in conducting and improving the extension activities of IAAS. MUCIA will provide financial support for extension activities as mutually agreed upon.

During the RD advisor's tenure there have been two phases to extension activities at IAAS. In January 1983, a new coordinator of extension, Mr. Pradeep Tulachan, was appointed. He held this position until Jan 23, 1984, when the extension group was reformulated to fit structural changes in the departments related to extension coordination.

While Mr. Tulachan was extension coordinator, the RD advisor worked very closely with him in planning and executing activities. The coordinator reported directly to the Dean and an Extension Committee which was formulated of a member from each subject matter specialization on campus. Several field activities were conducted which included a coordinated exhibition at the annual Devighat Mela, a Farmers' Fair at IAAS campus for 400 farmers, and several training sessions for local farmers including a training session in livestock care sponsored by the Livestock Department with the aid of the MUCIA Livestock Advisor and two sessions for women farmers sponsored by the Horticulture Department. The first of the Horticulture events focused on food preservation and kitchen gardening and the second session focused on kitchen gardening and horticultural crops. Group photographs of the first horticulture event have been distributed to all participants.

In addition, training was provided for 10 subject matter specialists in the use of motorcycles and all received drivers licences so that the subject matter specialists would be better able to extend their services to the pilot study area.

Equipment was obtained for the extension office in Rampur including 5 spraying devices for farmers to use. More recently bulletin boards for posting information on prices and new practices were put up at the Rampur office and in Sharadanagar town. Two equipment racks were added to the office in January to keep equipment more orderly.

Two field trials of broccoli and cauliflower were arranged for farmers' gardens with the help of the horticulture department. Three field trials of winter wheat with AIC suggested inputs were arranged on farmers' fields with the relevant information posted on sign boards in the fields.

Mr. Tulachan and the AD advisor designed a questionnaire, obtained base maps, and made plans for a 100% socio-economic baseline survey of the Pilot Extension area.

In January of 1984, the Department of Rural Development segmented

into the Department of Agricultural Economics and the Department of rural Sociology and Extension Education. With this structural change, responsibility for coordination of IAAS extension activities was shifted to the Chairman of Rural Development, Narayan Kunwar, and an In-Charge, (Rabi Poudel) was appointed to spend full time on extension activities.

In addition, Extension staff workers were increased to include three (and possibly 4) more junior personnel. Mr. Dhital serves as a JT and is assisted by Mr. Lama (a JT) and Mr. Dhakal (general extension worker). It is anticipated that Ms. Omas Parela (MA in Community Development) will join the group as a specialist in womens' activities. All are appointed through the Department of Rural Sociology & Extension Education.

The first activity of the new group was the planning of a yearly program and budget. This has now been accomplished in draft form and is being reviewed. The extension committee will meet soon to review the document. In addition, the new group has been making regular visits to each ward in the area to become more familiar with the farmers, leaders, and problems in each area. To this end, last week the group mentioned above (with the exception of Mr. Kunwar) visited Ward 9 of the pilot area and, at the request of the farmers of that area immunized 59 dogs in 4 different areas against rabies. This immediate response to request increased rapport of IAAS with the farmers. A similar program may follow in all of the 9 wards of the panchayat.

The new group also favors continuing the baseline study planned in the previous stage and are awaiting completion of informal visits to each ward to begin.

Recent discussions with the Dean indicate that he is trying, through the research committee, to shift the focus of research conducted at IAAS so that it is more related to the farmers' problems. The results of this research could then be more useful to the farmers and could be distributed through the Pilot Extension Project.

IAAS continues to maintain public service sites (buffalo, cattle, goats) at the livestock center. These pose a continuing threat to the health of IAAS herds and they have been encouraged to locate this activity nearer to the farm entrance. Relocation has not yet been effected.

VI. SPECIAL ACTIVITIES

A. Seminars (R)

In the last project report the RD advisor stated that one of the biggest challenges facing IAAS was in the sharing of results of research and travel tours through seminars. At that time, no staff member had presented a seminar, although several had been presented by visiting expatriates. It is a pleasure to report that seminar coordinator, M. Suvedi, has arranged to have several seminars presented by IAAS members and we expect many more in the future. Among those presented were:

Rishi Adhikari, a research seminar on "Crop Studies in the Chitwan".

Murari Suvedi, a end-of-tour seminar on "A Look at Cooperative Extension Service in the USA".

Narayan Kunwar, and end-of-tour seminar on "Communication Planning and Strategies for Agricultural and Rural Development".

Padam Prasad Sharma, a seminar on "MSTAT Computer Program and Its Uses for Agricultural Research".

Mr. B.P. Sinha, Dr. K. Pyakuryal, Mr. S. Shakya, Mr. B. Khakural, and Dr. H. Whittier a joint seminar on "Indonesian Higher Education and Rural Development".

Dr. Weslie Combs, Mr. M. Sapkota, Mr. B.B. Panta, Mr. B.N. Pokharel, and Mr. J.L. Yadav, a joint seminar on livestock activities in the Mediterrean area.

Visitors to IAAS have presented 5 seminars.

The sharing of information at IAAS is growing fast.

B. Survey of IAAS Graduates (R)

The Institute decided not to put this survey up for bids to an external agency. Rather, they requested Bhola Pokharel to revitalize his research project dealing with the Evaluation of the B.Sc. graduates of IAAS. The research for this project is now over 50% complete, and we can expect a report in two to three months.

C. IAAS Alumni Homecoming (R)

This activity has been postponed for an indefinite period presumably until the survey mentioned in VI.B. above is completed.

D. Fencing and Forage Development of North Farm (A)

Tenders for a perimeter barbed wire fence around the North Farm have been called and opened. Securing the boundaries of the farm is particularly difficult as most wire fences in the region have been breached by trespassers. The fencing must be accompanied by planting of fields which is respected by villagers.

E. Farm Land Shaping and Irrigation Development (P)(A)

It had been hoped to shape some of the wetlands of the North Farm to accommodate integrated vegetable-rice-fish production. This has not been initiated. A contract was initiated for development of the South Farm but was suspended to allow better planning. Now it appears the funds have been lost to IAAS because of a clerical error at T.U. The services of a short-term expert is needed to provide adequate planning.

F. Installation of Bio-gas Unit (A)

A 50 cu.m. Chinese-type, underground, fixed dome digester has been completed. Gas line connections to the dairy lab and 8 new staff quarters are being installed. The digester has been located adjacent to the old silo-pit on the North Farm which will be used for collecting the slurry effluent. Feeding trials with the slurry mixed with straw are being planned. Filling the digester with cattle and buffalo dung has begun.

G. Provision of Medical Doctor (A)

Following the three month stay of Dr. M. Wasiq, Spencer Eye Hospital, Karachi, a continuing arrangement for daily visits by a physician at Bharatpur has been made by IAAS with supplemental financial support from MUCIA.

H. Completion of campus master plan for medium term (10-20 years)(R)(A)(P)

H. James Miller, Professor of Architecture visited IAAS for a short period in October, 1983 and refined details for different approaches to such a master plan. His report contains a concise proposal, recommending that an academic planner be secured to assist IAAS and MUCIA in assembling the information essential for development of the master plan. Consideration is now being given to recruitment of an academic planner.

I. Establishment of Livestock Breeding Herds (A)

1. Goats

The inspection of Damascus goats on Cyprus during the

Livestock Study Tour resulted in a consensus, and some enthusiasm, for importing a nucleus breeding flock. The Damascus, or Shami, breed is very large, prolific, and produces exploitable quantities of milk. It is the only breed of goats designated by FAO for special development. They are expected to be particularly suitable for crossbreeding on the small, prolific goats and perhaps as purebreds on the Terai.

It is proposed to replace the Jamunapari crossbreeds in the present flock with more local Chitwan goats.

2. Sheep

The Livestock Study Tour also resulted in a consensus to import Greek Chios milksheep from Cyprus as a result of inspecting them and their performance record on Cyprus and Greece. The Chios is much larger than Nepali sheep, produces, carpet quality wool, averages near 2 lambs per litter, and produces exploitable quantities of milk. Their suitability is probably limited to the Terai for crossbreeding and possibly as purebreds.

Additional Nepali sheep, probably Kagi, are to be acquired.

3. Poultry

3.1. Chickens

Although 500 Shaver Starcross pullet chicks have been acquired, no specific breeding plan has yet been proposed.

3.2. Guinea fowl

Facilities to house Guinea fowl are not yet complete.

3.3. Pigeons

Facilities to house pigeons are nearing completion as part of a remodeling of one building.

4. Buffalo

The expected acquisition of additional Murrah buffalo has not been realized due to the cancellation of an Asian Development Bank program with Chitwan Irrigation District. Additional breeding bulls are urgently required.

5. Swine

The proposed acquisition of swine breeding stock has not been initiated by IAAS.

6. Cattle

The proposed acquisition of cattle breeding stock has not been initiated by IAAS.

J. Water for Lamjung Campus (P)(A)(R)

This continues to be a critical need but will not be met by this project. It should be completed under the World Bank project now under negotiation.

VII. ACQUISITION OF EQUIPMENT AND MATERIALS

A. Laboratory Equipment (P) (A)

During and following the short-term consultancy on laboratory equipment maintenance and repair, orders for \$75,000 worth of equipment were placed by MUCIA. The first major shipment of that equipment is now enroute by air freight. It is hoped that the remainder will arrive before the end of the contract period. Some equipment previously received is still not operational. Some has been found unsuitable for IAAS needs and procedures have been initiated for its sale or disposal.

B. Horticulture Nursery Stock (P)

Some stock and germplasm were obtained during a horticulture tour of 6 governmental farms in the Eastern Zone. The tour was financed by MUCIA and led by R.D. Advisor, H. Whittier. The list of germplasm obtained is in a co-authored report of the tour. A field trip to Lumle is being planned for April to obtain more germplasm.

C. Audio-visual Center Equipment (R)

Equipment lists have been made-prepared by the Communication Coordinator and the RD Advisor with advice from visiting lab equipment specialist Krauss and Dutch researcher Helmich. The basic equipment has already been ordered at an approximate cost of \$10,000. The equipment includes a complete Video tape unit, camera and monitor, new sound recording equipment, motion picture projector and screens, basic dark room set up and chemicals and 2 cameras for documenting research.

In addition, MUCIA has purchased curtains for the proposed Agricultural Communications Services Center and provided aid in the design of the center. IAAS has had the room repainted and refurbished. The center is now being used for seminar presentations which require slide or film presentation, and the course in communications is being taught in the room.

D. Extension Program Equipment (R)

During the period under review, MUCIA has provided equipment and furniture to the extension project. Five spraying devices were obtained for farmers to borrow from the extension office. Measuring tapes have been obtained to help the extension group carry out field activities. Two storage racks have been obtained for the extension office. Two bulletin boards have also been purchased and are located in front of the extension office and in Shardanagar town to provide a place to post notices important to the farmers, as well as a place to display, on a weekly basis, the prices of basic farm produce as paid in Narayanghat. MUCIA has offered to transfer one or two small motorcycles to IAAS, as they have frequently

been requested by the extension staff. The Institute prefers not to accept them at this time because of the difficulty of control of access.

E. Livestock Equipment (A)

1. A 1000 Kg livestock weigh scale for cattle and buffalo and a small-stock scale for sheep, goats, and swine have been ordered.
2. A heavy-duty squeeze chute for cattle and buffalo was deleted for economy with the expectation that the weigh scale can substitute for some purposes.
3. Livestock identification equipment including plastic eartags and tattoo supplies have been received.
4. Milk Processing Laboratory
Small equipment for yoghurt and cheese making have been ordered. The 1000 litre per day milk processing plant will likely be carried over into the next project.
5. Veterinary Laboratory
The veterinary laboratory and equipment are priority items in the next project.

F. Books and Equipment for branch Campuses (P)(A)(R)

Not accomplished. Will be given attention in renewed project.

G. Plant Protection Equipment (P)

Approximately \$12,000 of laboratory equipment has been ordered for plant protection. Consideration is being given to purchase of field equipment and facilities. If funds are still available when the request is made from IAAS, they will be used for this purpose.

H. Seed Testing and Laboratory Processing Equipment (P)

Approximately \$7000 worth of equipment and supplies has been ordered. A seed cleaner previously ordered and received remains unclaimed in the MUCIA storage building because of lack of adequate place to house it at IAAS.

I. Sports and Recreation Equipment (P)(A)(R)

Some such equipment has been purchased for IAAS. Weight lifting equipment has been requested and AID approval to purchase has been awaited for many weeks. It now appears that the difficulties in purchasing are insurmountable.

VIII. IAAS ACTIVITY COMMITMENTS

A. Complete Campus Development Master Plan

IAAS administration decided that this could not be completed by IAAS. The services of a campus planner were requested and secured, as indicated previously. While development of the complete master plan will not be possible under the present contract, a start will be made by an academic planner.

B. Complete Curricula Revision

All advisors have advised subject-matter groups on curriculum revision. New and revised course descriptions have been reviewed and commented upon. All advisors have met with IAAS Dean, Assistant Deans and departmental chairmen to review complete curricula. Presentation to the IAAS Faculty Board is scheduled for February.

C. Develop IAAS Faculty Policy Handbook

Consideration is being given to this activity but no action is apparent as yet. It may begin after completion of the staff evaluation plan described below in item E.

D. Development and Implementation of Farm Plan

Long term planning has been difficult to initiate at IAAS. A planning unit is now being activated by the Dean. The Animal Science Advisor, with the encouragement of the Dean, proposed a plan for better utilization of lands on the animal science farm. Encouragement has been given to having one person in charge of all IAAS farms, but this has not yet been done. It would encourage utilization of all lands according to capability and more easily permit both crops and livestock on each farm. A trade of some land between IAAS and the Maize Center is being arranged which will provide better land for development of a horticulture farm.

The Animal Science Advisor also proposed detailed plans for each work sector of the department to be achieved during 1984 and for completion by 1990. The proposals were drawn from discussions with the faculty and Dean over the past two years. Some faculty members have responded with suggested modifications.

The planting of 1 ha. of Leucaena fodder trees on the water-course banks is the most evident step in initiating an overall farm development plan.

E. Implement Staff Evaluation and Incentive Plan

A draft has gone through its second revision and was reviewed in a meeting of the full faculty on Feb 3, 1984. The R.D. Advisor was active in preparation of the first draft. Incentive programs will be worked on after the

acceptance of the plan by IAAS. The Institute is placing a high priority on evaluation and implementation of the plan is expected before project termination.

ACTIVITIES OUTSIDE THE WORK PLAN

1. The first subscriptions to Commonwealth Agricultural Bureau Abstracts, Nutrition (Livestock) Abstracts, Soils and Fertilizer Abstracts, and Development Abstracts have been purchased. Subscription to the Journal of the American Veterinary Medical Association has been terminated due to its preoccupation with the veterinary problems of dogs.

The library has now been furnished with attractive and sturdy wooden furnitures from the Butwal Furniture Company as part of the USAID building program at IAAS.

2. Computer

The APPLE II Plus microcomputer purchased in 1982 continues to give good service under the capable direction of P.P. Sharma. A second APPLE II Plus has been purchased and is in shipment. Repairs have been largely of disk drives. Connection to the MUCIA generators has made electrical supply dependable though there is an occasional break in transmission due to overload.

Mr. Sharma attended a 3 month training course on the MSTAT statistical analysis package at Michigan State University toward the end of 1983 and presented an informative seminar on the subject upon his return. He continues to be the principal user of the microcomputer. There is a need to increase faculty usage of the computers as many of them have had some introduction to computer use. Mr. Sharma has begun a training program for each department. There is substantial scope for use for both computation and word processing. Thought is being given to adding an IBM PC in the next cycle of computer development.

Both Animal Science Advisor and the Rural Development Advisor have acquired PINEAPPLE computers from Hong Kong which are fully compatible with the APPLE II Plus. They are used primarily for word processing.

A substantial collection of computer programs including games has been collected with little or no cost from source in Canada, the U.S. and Nepal. Computer buffs are occasional participants in Namaste APPLE computer club in Kathmandu. In addition there are now APPLE and VICTOR computer agencies in Kathmandu.

3. Safety and Medical Liaison

Despite one death in a trench cave-in, two drownings, and several serious injuries at campus construction sites in 1983, safety awareness remains low at IAAS. It is still the usual practice to insert bare wires into electrical outlets rather than fit cords with proper plugs.

Dangerous chemicals are used in laboratories without adequate ventilator and without a fume hood. A fire glass fume hood purchased by MUCIA is enroute by air freight. A metal one previously purchased by MUCIA is unusable.

All MUCIA vehicles are equipped with seat belts but MUCIA drivers are unwilling to fasten theirs. All riders of MUCIA motorbikes are required to wear safety helmets, though the example is not widely adopted among other riders on campus. Since completion of the ringroad around campus, drivers of MUCIA vehicles have been forbidden to drive on campus sidewalks to set an example of concern for the safety of pedestrians and playing children. The example has not been conspicuously followed by drivers of motorbikes, lorries, automobiles, tractors and oxcarts. One child has suffered a broken arm falling from a crowded IAAS pickup truck transporting campus school children without safety precautions. Farm tractors and campus vehicles are often operated at speeds too high for safe control and their mechanical condition is such that they probably could not be certified as roadworthy. A new pickup and a station wagon are on order for IAAS under the MUCIA project.

Generator operators are required to wear hearing protectors but compliance is often lax. Fire extinguishers in the MUCIA compound have been checked and replaced where replacements have been available.

MUCIA has installed outward opening doors at the rear of the auditorium as the former doorways had been bricked shut to prevent unwelcome intrusions in the more raucous days of campus development. The draperies, floor matting, and ceiling of the auditorium are flammable and could present serious hazard from smoke if ignited. Smoking should be prohibited, but has not been. Forward exits are located too near the stage curtains, open inward, and are often closed during auditorium use.

A Jersey bull seriously injured two farm workers, but much of the animal handling equipment constructed by Dr. Jesse Williams, previous Animal Science Advisor, is no longer used. Stray dogs abound and rabies is enzootic, treatment following dog bites is common. A few farm dogs have been immunized against rabies as have MUCIA advisors and their families.

All MUCIA families were immunized against Japanese Encephalitis B last summer and require such annually. Aralen, and anti-malaria compound is taken weekly year round. Most common complaints are gastro-intestinal afflictions often from the protozoan, giardia. All drinking water is boiled and most team members filter also and soak fresh vegetables in iodine solution. All MUCIA drivers and foodhandlers are required to have regular medical examinations at the USAID or the Kalimati Clinic in Kathmandu.

SPECIFIC
WORK PLAN OF MUCIA/NEPAL PROJECT
through September 1984

Supplement to: GENERAL WORK PLAN
OF WILSON AND SOFRANKO (1982)

PROJECT 367-11-110-102

CONTRACT AID/NESA-C-1197

MUCIA/NEPAL PROJECT
IAAS, Nepal
P.O. Box 984
Kathmandu, Nepal

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Work Plan of MUCIA (through Sept 1984)

I. Technical Assistance

A. Plant Science Advisor (P)

The Plant Science Division at IAAS includes Agronomy (Field Crops and Soils), Horticulture, and Plant Protection (Entomology, Plant Pathology, Weed Control) Departments. Nearly all food whether of plant or animal origin, depends ultimately on the growing of plants in soils. The program of the plant science advisor involves working with all faculty members in the division to achieve better teaching, research, and extension programs in pertinent aspects of field and horticultural crop production, crop protection and soil management. The Plant Sciences Advisor also serves as Team Leader to coordinate activities of the team and to help provide logistical support to team members and to IAAS. He works closely with the Dean and Assistant Deans in many matters not directly related to the subject matter role and including improving internal organization of IAAS, strengthening of MUCIA/IAAS relationships, teaching improvement, faculty development and evaluation, research improvement and management, completing inventory of MUCIA/AID supplied equipment and keeping accurate records of location and condition of such equipment; and assisting in promoting student welfare.

B. Animal Science Advisor (A)

The general role of the Animal Science Advisor will be: (1) resource person to the Department of Animal Science, and (2) technical advisor to the Dean and the Animal Science faculty on matters of research, teaching, extension, curriculum and livestock farm and herd development and management. In addition, the Advisor has been assigned as liaison person between the MUCIA team and IAAS in matters of safety and medical first aid, and for library and computer development.

C. Rural Development Advisor (R)

The Rural Development Advisor's work plan focuses on acting as a general resource person to the Rural Development Division (including Rural Sociology, Agricultural Economics, Agricultural Communications and Extension Education) and to the administration of IAAS concerning such activities as manpower and staff development, institution building, teaching and curriculum development, and research and extension activities in Rural Development. Advisor will act as a general consultant to the IAAS Pilot Extension Project and aid in the development and dispersion of information generated by campus research activities through support of the campus seminar committee, the IAAS Journal and the proposed Agricultural Communications Services Center.

D. Short-Term Consultants

The long-term advisor who will work most closely with the indicated short-term advisor is shown by: (P) for Plant Science, (A) for Animal Science and (R) for Rural Development.

1. Statistics and Research Design (A) 3 mos.

A short course in research methods and analysis will be offered at IAAS for faculty on a credit basis. Two instructor/consultants will be recruited to teach and consult with individual faculty members on their research.

2. Communication and Audio-visual specialist (R) 1 mo.

In line with the development of the Agricultural Communications Center, a short term consultant will be arranged who will help develop the organization for the use and maintenance of equipment for the center and help refine future growth plans for the center.

3. Laboratory Equipment Specialist (P) 2½ mos.

A person with training and broad experience in maintenance and repair of general kinds of laboratory equipment will be recruited. At IAAS the specialist will work with one designated faculty member in each department. He/she will train these faculty members and others in preventive maintenance as well as in repair procedures. He/she will also stress laboratory organization and sanitation.

4. Specialist in Training of Trainers (R) 2 mos.

All of the IAAS faculty members are trainers of trainers and it is expected that the B.Sc. graduates of IAAS will also eventually be trainers of trainers. USDA Short course #TC110-15: Training of Trainers for Agriculture and Rural Development offers a set of objectives which will fulfill this need. Rather than send a large group of participants to the USA for this course, arrangements will be made to teach this course or its equivalent to a selected group of IAAS faculty members on campus.

The participants will develop knowledge and skills to : (1) improve training effectiveness, using training resources to give the most appropriate information and skills to trainees; and (2) strengthen and update their knowledge in their own areas of specialization.

5. Library Science Specialist (A) ½ mo.
 The Library Consultant will review library operations and advise on library development. Services of the consultant will not be scheduled until a librarian is recruited.
6. Experiment Station Management Specialist (P) 5 mos.
 Two kinds of assistance will be provided by one or two consultants: (a) Layout of a part of the IAAS farm for improved drainage and for irrigation. (b) Training of IAAS farm manager (s) in providing routine farming operations and labor for field research projects and working with project leaders to schedule field activities ahead of time so farm managers can provide services requested & use labor/equipment most efficiently.
 If it is not possible to recruit one individual who can perform both tasks, two consultants will be provided within the time allotment indicated.
7. Extension Communications Specialist (R) 1 mo.
 A specialist will be selected to help bridge the gap between the proposed Agricultural Communications center and the pilot extension project if this is deemed necessary.
8. To be determined (P) 1 mo.
 Provision is made for a short-term consultant in a field not yet identified as requiring assistance.

II. Training (Long-term advisor who will assume primary responsibility for facilitating the training shown by (P), (A) or (R) as above.)

A. Short-term training

1. Courses in Nepal

An attempt will be made to schedule an appropriate USDA short-course to be given in Nepal. If arranged, this course would be instead of the services of a corresponding short-term consultant indicated above. If the course can not be arranged, the consultant recruited will present an organized course as part of his consultancy.

1.1. Design and analysis of agricultural experiments (A)

A 6-week short course in research methods and analysis will be offered by short-term consultants at IAAS for faculty with credit toward promotion; lectures and individual consultations will be included.

1.2. Training of Trainers (R)

The short course mentioned above (I.D.4) will be offered on IAAS campus for selected faculty members either by USDA sub contract personnel or by approved short term consultants. If possible credit towards promotion will be arranged for participants.

1.3. Audio-visual training (R)

Training in the use and maintenance of audio-visual equipment will be provided for a group of persons who will be associated with the Agricultural Communications center. This training will be handled by the short term consultant listed in I.D. 2 above.

2. Training for administrative staff of IAAS (P)

Selected administrative staff members will be provided short-term training at appropriate institutions to improve their competence to manage a growing institution. Training course available in the region will be utilized wherever possible.

3. Overseas training course for academic faculty of IAAS (P)

Selected faculty members will be provided short-term non-degree training in specialized subjects. The program of the faculty member and the relevance of available courses will be considered in selection. USDA short courses offered in USA will be utilized for part of the training.

B. Study tours for academic staff

1. Mediterranean Livestock Study Tour (A)

A 3 week tour with 7 or 8 faculty members will be taken to Cyprus (goat and sheep), Greece (sheep, goats, cheese processing), and Italy (buffaloes, cattle, sheep) with emphasis on multi-purpose livestock models applicable to Nepal.

2. Rural Development Study Tour to Indonesia (R)

Rural Development Study Tour to Indonesia. A 3 week study tour of 5 of the major agricultural universities in Indonesia, with special conferences with members of the Ministry of Agriculture and the Ministry of Higher Education and the Konsortium of Agricultural Sciences will be arranged for a team of 7 or 8 faculty members from IAAS including members from each of the major disciplines (Animal Science, Plant Sciences, and Rural Development) and the Dean of IAAS. MUCIA R.D. Advisor will be the coordinator and the tour guide.

3. Plant Science Study Tour (P)

One or more tours of one to three weeks duration will be arranged to study plant sciences programs in relevant country or countries. It is expected that these will be arranged in late 1983 or in 1984. Tours will include the international center, ICRISAT, in Hyderabad, IARI in New Delhi and some agricultural universities in India. A tour to the international center, IRRI, and to University of the Philippines at Los Banos may also be arranged.

C. Administrative Visit to MUCIA Universities (P)

The Dean and one other senior administrative staff member of IAAS will each visit MUCIA Universities for approximately ten days to confer with MUCIA officials and to review administrative procedures and policies at those universities.

D. AID financed training program in India

Two or more participants per year can be sent by AID funded India Training Program for degree training in India at no cost to the project. Two or three short-term participants can also be sent each year.

III. Research Programs

MUCIA Advisors will work with IAAS faculty and administrators and serve as members of the research committee to best utilize project financial support for building research capability of IAAS faculty. Research proposal guidelines will be revised to insure that research is adequately planned and is pertinent to Nepal's agriculture and to IAAS's mission. Encouragement and assistance will be offered to faculty members in planning and conducting applied research and in making results available to interested persons.

A. Plant Science

Currently there are twelve research projects in progress in the plant sciences which are receiving MUCIA funding. Other areas of research which should be emphasized in plant sciences include;

a. Water management for crop production

There is immense opportunity for improved drainage, irrigation, and moisture conservation programs.

2. Development of cultural practices of field and horticultural crops for increased yields including:

2.1. Screening of germ plasm for selection of cultivars with potential for high yield under Nepalese conditions in cooperation with national programs in important crops.

- 2.2. Improved tillage and planting procedures.
- 2.3. Improved plant protection practices.
3. Nursery management for horticultural crops and improved landscape design and maintenance.
4. Improvement of integrated pest management programs.
5. Nursery management practices.
6. Seed quality studies.

B. Animal Sciences

The general areas of research to be emphasized in animal science include:

1. Forage evaluation

Evaluation of varieties of *Leucaena leucocephala*, a productive tropical leguminous fodder shrub/tree, has been formally proposed.
2. Feeding of crop residues
 - 2.1. Concentrates

Projects evaluating mustard cake are in progress.
 - 2.2. Roughages

Projects testing grain straws have been formally proposed.
3. Biogas residues

The feeding of biogas residue/slurry/sludge will be undertaken when biogas units are installed and operating.
4. Breed Evaluation
 - 4.1. Goats

Improvement of the size and milk yield of local goats while maintaining or improving their prolificacy will be undertaken.
 - 4.2. Sheep

Improvement of size, prolificacy, milk yield, and wool yield of local sheep will be initiated as this offers enormous opportunities for developmental research.
 - 4.3. Poultry

Poultry developmental research with chickens, pigeons, and Guinea fowl will be initiated under conditions of village scavenging.

5. Milk characteristics and processing
 - 5.1. Comparison of milk composition of Haryana cows and Murrah buffaloes has been formally proposed.
 - 5.2. Evaluation and characterization of goat and sheep milk for cheese, yoghurt and ghee will be undertaken.
6. Integrated fish-animal production
Construction of fish ponds is in progress.
7. Animal traction
Research into modernization of traditional farming techniques with modern equipment for animal traction will be undertaken.

C. Rural Development

Current and projected projects include:

1. Radio and other sources of information to the farmers in Chitwan District (P.I. Narayand Kunwar). Funded MUCIA project in process.
2. The evaluation of the B.Sc. Agriculture Program at IAAS, Rampur, Nepal, (P.I. Bhola Pokharel). Funded MUCIA project. Original project stalled but about to be reactivated.
3. A study of Farming Systems: A Case Study of Sharadanagar Panchayat (P.I. Pradeep Tulachan). Funded project in process.
4. Continuous research and evaluation of IAAS Pilot Extension Project. (RD Advisor and RD staff).
5. Assist in the development of new research projects within the Rural Development Division.
6. Research in the area of women's role as agriculturists in the Terai.

IV. Teaching Program (P) (A) (R)

MUCIA Advisors will assist IAAS faculty and administration in their efforts to improve teaching and curriculum and to encourage and reward superior teaching. This will include.

1. Preparation of syllabi and/or textbooks for assistance to teachers and guidance to external examiners.
2. Development of course outlines to define course objective and to reflect accurately what is being taught.
3. Development of elective courses to permit some specialization and pursuit of special interests and talents.

4. Arranging of seminars concerned with teaching improvement, evaluation of teaching, and related subjects.
5. Encouragement and assistance in developing at least ten textbooks for use in IAAS courses. Financial incentives will be offered from MUCIA funding.

V. Extension Activities

MUCIA Advisors will assist IAAS faculty and administrators in conducting and improving the extension activities of IAAS. MUCIA will provide financial support for extension activities as mutually agreed upon.

The Rural Development Advisor serves as the primary counter part of the Coordinator of the IAAS Extension Committee. He also helps coordinate extension support by the other advisors. Special attention will be given to making the IAAS Pilot Extension Project more effective and relevant, not only to the needs of the local farmers but also as a teaching and research unit for the Institute.

VI. Special Activities

A. Seminars (R)

MUCIA Advisors will assist in development, conduct, and support of a regularly scheduled seminar series at IAAS. The R.D. Advisor will work closely with the seminar coordinator in this effort. While this will include guest speakers from other Nepal-based projects and agencies as well as visitors from other countries, one focus will be to encourage IAAS staff members to share the results of their research, study tours and experiences abroad.

B. Survey of IAAS Graduates (R)

The R.D. Advisor will assist IAAS in conducting a survey of its graduates. Terms of reference are being written to contract with an objective, external organization to conduct the survey.

C. IAAS Alumni Homecoming (R)

Related to the above survey, IAAS plans to invite selected alumni to return to IAAS and participate in a seminar to help ascertain any weaknesses in the IAAS curriculum. The R. D. Advisor will provide assistance.

D. Fencing and forage development of North Farm (A)

A strong perimeter fence of about 4.2 miles (ca 7000 metres) is required to stop encroachment of villagers on IAAS fields and to prevent contact of outside livestock with IAAS livestock with risks of disease and unscheduled matings. MUCIA will assist in planning and in financing this activity.

E. Farm land shaping and irrigation development (P) (A)

In order to improve drainage to permit earlier planting after rains and to permit development of deeper rooting zones for crops, a land shaping and ditch-drainage system will be installed on part of the IAAS farms. A short-term consultant may assist IAAS faculty and MUCIA Advisors. Funds may be available from the Chitwan Irrigation Development Project to help with the North Farm.

F. Installation of Bio-gas Unit (A)

Biogas digesters will be installed to render night soil and livestock dung safe for use as fertilizer or ruminant feed and to provide some of the fuel needs of staff and laboratories.

G. Provision of Medical Doctor (A)

Arrangements are being made for a volunteer physician. MUCIA will provide housing on a trial basis for the doctor.

H. Completion of Campus master plan for medium term (10-20 years)(R)

Long-term advisors, with possible assistance of a short-term consultant, will assist IAAS staff with the development of a Master Plan for Campus Development. The master plan will take into account future teaching, research and extension responsibilities of IAAS and will be for use by the Institute in obtaining future funding for campus development and in planning campus development and conform to an over-all plan.

I. Establishment of Livestock Breeding Herds

1. Goats;

The project will assist in procuring nucleus herds of local and Damascus (Shami) goats for evaluation and to initiate improvement of local goats in meat and milk production.

2. Sheep

The project will assist IAAS in procuring nucleus flocks of local Kage. A prolific milking breed such as the Greek Chios or German East Friesian Sheep will be established with importation of animals or semen. These flocks will permit evaluation and initiation of genetic improvement of local sheep in meat, milk, and wool production.

3. Poultry

3.1. Chickens

The project will help provide flocks of local chickens, jungle fowl, and "improved" breeds or hybrids for evaluation and for development of improved local breeds.

3.2. Guinea fowl

The project will help provide local and improved guinea fowl for evaluation as alternatives to chickens under village conditions.

3.3. Pigeons

The project will help provide local and selected populations of pigeons for evaluation and possible hybridization for improvement of meat and egg production.

4. Buffaloes

The buffalo development program will be funded by Chitwan Irrigation District under an Asian Development Bank Loan.

5. Swine

The project will help acquire some breedingboars or semen, plus the establishment of a nucleus herd of local swine.

6. Cattle

Bulls and/or semen for the Hariana cattle herd will be acquired for improvement of milk yield and draught characteristics, through pure breeding or crossbreeding.

J. Water for Lamjung Campus

A water supply is urgently needed. Some MUCIA funding may be available but not in amounts adequate to complete a water supply. Assistance in securing other funding sources will be provided if desired.

VII. Acquisition of Equipment and Materials

MUCIA Advisors will assist IAAS faculty in developing lists of needed equipment for teaching, extension and research. MUCIA funding will be utilized within the limits of the budget available. Special attention may be given to the following:

A. Laboratory equipment (P) (A)

The short-term consultant in laboratory equipment maintenance and repair should provide valuable advice regarding laboratory equipment needs. Completion of the inventory of MUCIA/AID-provided equipment will facilitate development of needs. A workable fume hood will be obtained.

B. Horticulture Nursery Stock (P)

Assistance will be provided to develop needs for nursery stock and to help finance acquisition.

C. Audio-visual center equipment (R)

The R.D. Advisor and the short-term consultant will assist in organizing the Audiovisual Center, in ascertaining the equipment needs and in facilitating the purchase of the proper equipment. Tentative lists have already been prepared.

D. Extension program equipment (R)

The R.D. Advisor will assist the coordinator of the Extension committee to define the equipment needs of the Pilot Extension Project and assist in obtaining the required equipment.

E. Livestock equipment (A)

The following equipment needs are recognized and the project will assist in purchase of the equipment.

1. A 1000 kg weigh scale as well as several smaller scales for small animals.
2. A heavy-duty squeeze chute to facilitate the handling of buffaloes and cattle with a minimum of risk to the livestock and the staff and students.
3. Livestock identification equipment and supplies and other livestock management equipment.
4. Milk processing laboratory-
Equipment for processing up to 1000 litres of milk per day for the making of cheese, yoghurt, and ghee.
5. Veterinary laboratory-
Equipment for blood testing and other routing diagnostic procedures.

F. Books and Equipment for Branch Campuses (P) (A) (R)

The Project will procure books and equipment necessary to meet the immediate teaching needs of the branch campuses. Emphasis will be on purchase of textbooks and of equipment for student practicals.

G. Plant Protection Equipment (P)

Field plot and laboratory equipment are needed for teaching research and extension program in plant protection. Assistance will be provided, as feasible, to meet the need.

H. Seed testing and laboratory processing equipment (P)

Equipment is needed for student instruction in seed technology and for short-course instruction if IAAS decides to undertake such activities. MUCIA will help provide such equipment.

I. Sports and recreation equipment (P) (A) (R)

MUCIA will assist IAAS in acquiring needed equipment for group sports activities to promote student health, welfare and recreation.

VIII. IAAS Activity Commitments

The following activities are considered very important for the future development of IAAS. IAAS will assume responsibility for implementation of these activities. MUCIA specialists will serve as advisors and work as appropriate with IAAS staff complete these activities.

A. Complete Campus Development Master Plan

While MUCIA will assist in development of an up to date campus master plan, major responsibility for planning and final acceptance of a master plan lies with IAAS. The plan should identify future goals and responsibilities of IAAS and also identify construction and other needs to meet these goals. MUCIA will print the final master plan.

B. Complete Curricula Revision

Curricula revision will be a continuing activity of the Institute as courses change. During the final period of the IAAS project, the Institute will revise and MUCIA will print an up-dated IAAS Bulletin.

C. Develop IAAS Faculty Policy Handbook-

IAAS will review current Institute policies and establish other policies as appropriate. Those will include policies on such issues as housing assignments, research activities, training eligibility, leave, consulting assignments, and assignment of other perquisites and duties. In areas where the Institute is constrained to follow T.U. regulations, the appropriate T.U. policies will be included in the Handbook. MUCIA will print the Handbook developed by the Institute.

D. Development and Implementation of a Farm Plan

IAAS will revive its Land Utilization Committee to develop and begin implementation of a comprehensive Farm Plan based on current soil survey information. A variety of appropriate local cropping systems will be utilized on appropriate land areas to make maximum use of the Institute farm in teaching research, demonstration, and production. The Farm Plan, to the extent possible, will integrate farm activities and stress those activities appropriate to the conditions of Nepali farmers. MUCIA will print the Farm Plan developed by the Institute.

E. Implement Staff Evaluation and Incentive Program

IAAS will develop a system for regular staff evaluation, including both quality and quantity of work output. Institute policy in this regard will be included in the IAAS Faculty Policy Handbook. The Institute will begin implementation of this evaluation system and will establish an incentive program to recognize outstanding staff members.