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ACADEMIC PLANNING:

Phase I -

INSTITUTE OF AGRICULTURE AND ANIMAL SCIENCES,
Tribhuvan University
Rampur, Nepal

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March-April, 1975

Final Report to:

N E S A / T E C H
P S D A I D Washington

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PREFACE

After several weeks of telephone negotiations with U.S. AID/NESA (Nepal) I left Champaign-Urbana, Illinois on March 21, 1975 for a one-half day conference in Washington and signed my contract. That afternoon I left for Nepal, via Istanbul where a rest stop was made. I arrived in Kathmandu about noon on March 25, 1975. Professor H. James Miller, University of Illinois architect and campus planner for the IAAS had arrived several days before me. A luncheon meeting had been arranged for Professor Miller, Mrs. Smith and me at the home of Director and Mrs. Charles Grader, and a dinner meeting at the home of Dr. and Mrs. Burton Newbry, Chief, Human Resources Development Division. Plans had also been arranged for Professor Miller, Dean Rajbhandary, Mrs. Smith, me, and Mr. Ganga Prasad Acharya, to fly to Rampur at 3 p.m. the next day in a chartered STOL. Work with the Dean, Professor Miller and faculty members of the IAAS started on March 27.

On April 17, 1975 I received a message asking me to return to Kathmandu as soon as possible in order to consult with Dean Rajbhandary and Dr. Newbry before they left for Washington on April 19. I arrived back in Kathmandu on April 18 and after consultations there with the Dean, Dr. Newbry, Director Grader, and Mr. David Teidt, U.S. AID/Washington, Mr. Merril Asay, U.S. AID/Rampur, and Ambassador William Cargo, I departed Nepal for return to Illinois on April 22, 1975.

PART I

OBJECTIVES AND SCOPE OF WORK

The objective of my assignment was simply but broadly stated in my contract: "To assist the Government of Nepal (GON) His Majesty's Government (HMG) in the development of academic plans for the new Institute of Agriculture and Animal Sciences, (IAAS)."

The scope of work as outlined by the contract called for a "review of the institutional development plans for the Institute of Agriculture and Animal Sciences (IAAS) as presented in the PROP, in the MUCIA Report, and in other related planning documents of HMG," familiarization "with the present physical environment of the IAAS, including physical structures already completed, and review the proposed institutional organization, projected enrollments in the various fields and curricular offerings;" and to "develop a general understanding of the academic structure of Tribhuvan University and the Institute system in Nepal".

Following "familiarization with the background and plans for the development of the IAAS," I was to assist HMG in finalizing the academic plans for the IAAS, including academic organization, administrative structure, and teaching and research structure, with student flows in various academic areas." Then, in collaboration with the Architect/Campus Planner, I was to "assist in the translation of the academic plans into a campus plan, with space requirements for all academic, research, teaching administrative, library, and auxiliary facilities sufficient to the need of delineating capital requirements for the physical development of the IAAS."

I had already studied the MUCIA Report, *Higher Education in Agriculture in Nepal*, The Report of a Pre-feasibility Study, (1972). I hastily familiarized myself with the PROP report which Dr. Newbry provided me upon my arrival.

PRESENT SITE AND PHYSICAL FACILITIES

The IAAS was moved from a location near Kathmandu in mid 1973. It is approximately 145 miles south and west of Kathmandu in the Chitawan region (Rapti Valley) of the inner Terai at an elevation of approximately 400 feet. While this is only 35 minutes by plane from Kathmandu, it is a nine hour drive by mountain roads and river bed crossings. It is eight miles from Bharatpur, the nearest commercial airport. There is a grass landing strip on the campus which is adequate for a STOL.

The present campus consists of approximately 300 acres and is directly across the road from a National Maize Research Center of 640 acres, about half of which is used for cattle, buffalo, and hog pasture, with the remainder devoted to crop production.

The Institute is housed in an old training center with the following main buildings:

1. An administration building with staff offices, a library, some classrooms and laboratories (chemistry, physics, and biology).
2. An old gymnasium-auditorium type building with classrooms and some business offices.
3. A student hostel with a capacity of about 200 students (four to a room).
4. A dining mess hall and inadequate kitchen or food preparation building.
5. Two 2-bedroom houses used by AID; and two small and two larger trailers (all old) presently being installed. The two smaller ones are apparently intended for short termers or transients. The larger ones are to serve long term people (without children).

6. A house used by the Dean for office, conferences, and sleeping.
7. A Nepalese guest house.
8. Individual and row housing for staff members.
9. Several farm mechanics buildings, a building being used for a chicken brooder house, and one poultry house.
10. One water tank (Overhead).
11. A small orchard with three types of fruit trees.
12. Fairly extensive plots adjacent to the main campus buildings for crop production, demonstration and research.

RELATION TO TRIBHUVAN UNIVERSITY

The Institute of Agriculture and Animal Sciences is one of several Institutes related to Tribhuvan University. It is to be the Agricultural Institute in the country. Others in operation include: Education; General Science; Engineering; Arts, Humanities, and Social Science; and Commerce and Business Administration. In future planning stages are Medicine, Veterinary Medicine, and Forestry. The latter two may or may not become affiliated with the IAAS. All of these report to the Ministry of Education through Tribhuvan, which is headed by the King as Chancellor, and a Vice-Chancellor.

COORDINATION OF CAMPUS AND ACADEMIC PLANNING

Because my departure date for Nepal was delayed several weeks by factors beyond my control, it was impossible to proceed with my academic planning assignment in an orderly fashion during the first six days. The campus planner, whose time was limited, needed certain information immediately in order to complete a master campus plan. I therefore devoted the first four days to meetings with Dean Rajbhandary and staff members to obtain or determine:

1. The most accurate information possible about the physical and institutional organization.
2. The best possible figures on current enrollment (200 at Rampur), and the best estimates of enrollment over the next 3, 5, and 8 years.
3. Course offerings; number, type, and size of laboratories and classrooms needed.
4. Academic buildings needed, relationship of academic units, and logical groupings.
5. Academic offices needed (based on present and projected staff).
6. Faculty numbers, offices and housing needed.
7. Hostel, kitchen, and dining facilities needed in first building phase.
8. Administration building needs, space, etc.
9. Needs and location of Agricultural Mechanics shops.
10. Needs for poultry farm (hatchery, brooder house, candling, sorting area, laying houses.

Out of these studies involving consultations with the Dean, Mr. B. N. Sharma, Campus Chief, and Mr. Tej Prasad Giri (curriculum planner), other staff members, and Professor Miller, a concensus was reached that we could reasonably expect the campus enrollment to double from 200 to 400 students by 1978. Thus the first phase construction should provide for:

1. An academic building for Arts and Sciences to provide the needed service course of the first two years such as English, Chemistry, Mathematics, Biology, Nepal Rachna (composition) and Nepal Parichaga (government).
2. An academic building for crop science (crops, soils, horticulture, entomology, plant pathology).
3. An academic building for Animal Science.
4. Classroom buildings adjacent to above academic buildings.
5. New and functional agricultural mechanics shops, storage, and adjacent offices as needed.
6. Poultry farm buildings (phased as needed).
7. Certain farm field buildings for storage, demonstrations, etc.

It was agreed that a new administration building would be in the second phase priority and that the present administration-classroom building could serve as an administrative building for several years.*

In connection with the Agriculture (Academic) Areas mentioned above (crop science, animal science, and agricultural mechanics), it is recommended that the department head, chief or chairman, of each unit be housed within the building designed for that area (discipline) and not be separated from his staff by being placed in the proposed future administration building in a cluster around the Dean and other campus administrators. With regard to areas such as Agricultural Economics, Agricultural Education, and

*See Appendix I

Agricultural Extension, I found there is only one resident faculty member in each of these areas at the present time. They can continue to be housed in the present administration-faculty building for at least four or five years even if their numbers double.

The campus planner and I were favorably impressed with the existing library. In fact it was one of the bright spots of all of the facilities, well lighted, well operated and apparently well-used. Like all libraries it needs certain additional books but this can be corrected without a new building at the present time.

In terms of auxiliary service buildings, the campus planner and I are recommending a new hostel to accomodate 200+ students, with kitchen-dining facilities for a similar number.

New staff housing is also recommended in Phase I. (See Campus Planner's report).

Professor Miller and Dean Rajbhandary left Rampur for Kathmandu on March 31. I remained at Rampur until April 2 to gather more data, then went to Kathmandu to meet again with Professor Miller and the Dean that evening and on April 3 and 4 prior to Professor Miller's departure from Nepal on April 4. Unfortunately, the Dean was tied up with other commitments at Tribhuvan, Director Grader was on vacation and Dr. Newbry was on tour on his way to Rampur.

After my final consultation with Professor Miller, I visited Tribhuvan University with special attention to the library and the School of Education. From an architectural standpoint, the buildings are neither characteristic of Nepal nor do they give one a sense of unity. I hope this can be avoided at the IAAS. I then visited the Administrative headquarters of the University where I met briefly with Dean Rajbhandary.

THE ROAD TO RAMPUR

Having called Dean Rajbhandary on April 5 only to discover that he would not be able to return to Rampur with me, I departed Kathmandu early on April 7 by station wagon. The 145 mile road is indeed an experience of a lifetime. It gives one a close-up view of the mountains, farms, and villages, people, terraces and crops. It also emphasizes the problems of modern transportation and communication in such terrain. After reaching the inner Terai area at Hitaura and the Rapti River (barely a stream in April in search of a river bed), one enters an entirely different type of environment. Except for a few rice paddies near the river, the Rapti-Chitawan Valley is now hot with searing winds and blowing dust. This 65 mile drive is on what my map calls "unmetalled" road. There are numerous fords (completely impassable in the rainy season), as well as many rocks, boulders, and chuckholes, with the "road" from Bharatpur to Rampur (eight miles) the very worst. Since Bharatpur is both the nearest town of any size to the IAAS and the site of the airport and hospital for staff and students, it is an important center for the IAAS. For comfort, convenience, safety, and economy, this stretch of road should receive high priority for improvement.

PART II

ACADEMIC PLANNING

Out of necessity, due to timing, I had completed part three, coordination with the Architect/Campus Planner, prior to part two. Upon my return to the IAAS campus, I turned to a complete study of the present curriculum, student flows, and numbers in various programs, priorities for training of students and draft proposals of appropriate one, two, and five year programs of study.

Before one can competently plan an academic program of study of higher education in Agriculture, one needs to know as much as possible about the agriculture, climate, topography, soils, etc. of the country and the manpower needs for trained agriculturists.

BRIEF VIEW OF THE NATURAL ENVIRONMENT AND AGRICULTURE OF NEPAL

Nepal is a land of contrast and variety. With an area of 54,000 square miles, it is only slightly smaller than the state of Illinois and a little larger than England. Unlike Illinois, which extends nearly 500 miles north and south and averages perhaps 150 miles wide, Nepal extends approximately 500 miles east and west and 150 miles north and south. No other country in the world has as much variation in elevation as does Nepal, from the flat lands of the Terai in the south ranging from 200 feet elevation to the Himalayas capped by majestic Mt. Everest which reaches 29,028 feet into the heavens. The Himalayas, which extend 1,500 miles across five

countries -- from Afghanistan, India, Tibet, and Nepal to Bhutan have more than 50 peaks over 25,000 feet.

This gigantic mountain range varying from 100 to 150 miles wide has probably had more effect on the people, history, life, agriculture, and customs of Nepal than any other single factor. The Himalayas have provided protection from invasion. At the same time, they and the adjacent hill country have hindered communication, transportation, education, agricultural development, and migration of people and ideas. Over 90% of the labor force is devoted to agriculture.

In the Terai area the average rainfall varies from 80 to 100 inches. During the monsoon season the southern side of the Himalayas have as much as 350 to 400 inches of rainfall annually, spawned by the moist winds heading north from the Bay of Bengal. This in turn is a major factor in the determination of when crops can be planted, what crops can be grown, yields, diseases, insects, etc. Variations in elevation have similar effects upon the agriculture sector of the country.

The hill country produces 39% of the food grains while the Terai produces 61%. In the hills, maize grown on terraced land, is the most important crop, followed by rice. In the Terai, rice is by far the most important crop, except in the inner Terai where maize is a close second. Potatoes are an important staple in the high Himalayas.

Even with all its problems and handicaps Agriculture provides 80% of Nepal's export earnings. Double cropping occurs in some areas with certain crops.

Nepal's greatest human food need is for high protein grain and livestock products. A few soybeans are being produced (probably mainly on the

research farms) but the total production must be very small in comparison to the need.

It is estimated that livestock contributes 22% of the agricultural production of Nepal. Even so, the per capita consumption of meat, milk, and eggs is low. While all estimates of production are shaky at best, the estimated production in 1969-70 was Buffalo 46,000 metric tons, pigs 19,000 m.t., and sheep and goats combined 7,000 m.t. Omitting foul and fish this converts to approximately 15 lbs. of red meat per capita annually.

I have not found any production figures for fruits and vegetables. In the Kathmandu Valley and some other localities that I have observed, the kitchen garden is quite popular, provides a variety of fresh vegetables (potatoes, cabbage, tomatoes, carrots, onions, etc.) and should be encouraged through both formal and non-formal education.

Unfortunately, from what I have observed and been told, most Nepal fruit is of poor quality. The only fruit of good quality that I have found was tangerines. I was not able to determine if they were grown locally or imported from India. Whether the problem is one of climate, variety, or what, I do not know, but it certainly needs investigation and improvement of varieties if that is the problem.

Much of the above is based on the MUCIA report and a publication *Natural Environment And Crop Distribution in Nepal*, by Dr. K. B. Rajbhandary.

TRAINED AGRICULTURE MANPOWER NEEDS

The higher education needs of the Agricultural sector in Nepal are well described in the MUCIA report, (Chapter II, B) and can be summed up

from one sentence of that report, "Trained manpower at all levels are needed for the Agricultural sector of the economy."

The PROP report also sites numerous needs, and statistics including:

1. Agricultural Extension Agents, Regional Agricultural Directors, and District Level Agricultural Development Officers. The present shortage of J.T.A's is estimated at about 400 for extension (See page 19)
2. Vocational Agriculture teachers. Estimates range from 650 to 1200 needed by 1978 if 70% of the secondary schools are to provide vocational education in agriculture, as recommended by the M.E.S.P.
3. Some 2,000 trained agriculturalists are needed (by 1975) in government service alone.
4. The Agricultural Marketing Corporation (AMC) and the Agricultural Development Bank both need large numbers of middle level agriculturalists. (J.T.'s).
5. Degree graduates are needed for all fields of agriculture i.e. crops, soils, plant protection, animal science, horticulture, plant breeding, nutrition, agricultural mechanics, marketing, agricultural credit, management, procurement, supply, distribution, ..., to name a few.

It is thus extremely difficult to rank the training needs by priority, since all are both large and pressing in a country which has had no in-country degree programs in agriculture in the past. The first B.S. in Agricultural Education students (25) were graduated in early April of 1975. The students were drawn from certificate-General Science graduates under a crash program and given two years of agricultural education training

at the IAAS. This two year program on top of a two year general science certificate program provides them with 14 years formal education (as compared to the usual 16 in the U.S.). All elementary and secondary education programs in Nepal consist of a maximum of ten years. Upon satisfactory completion of the required examinations, the student receives a school leaving certificate (SLC).

There are actually four distinct programs in operation at IAAS at the present time: (See chart page 14.)

1. The one year certificate program. (This includes students enrolled at five satellite campuses, plus the main campus.)
2. The two year certificate program.
3. The two year B.S. (diploma) program in Agricultural Education.
4. In-service training.

Students in the first year certificate program come from secondary schools (SLC). Theoretically, those in the two year certificate program may be either recent graduates of the one year certificate program or former graduates who are brought back after one or more years experience as junior technical assistants. (J.T.A.'s) Upon completion of the two year certificate program they are employed as junior technicians (J.T.'s).

The Agricultural Education students are recruited from either recent general science certificate graduates or from such graduates with one or more years work experience.

The present one year J.T.A. course content can be summarized as follows:

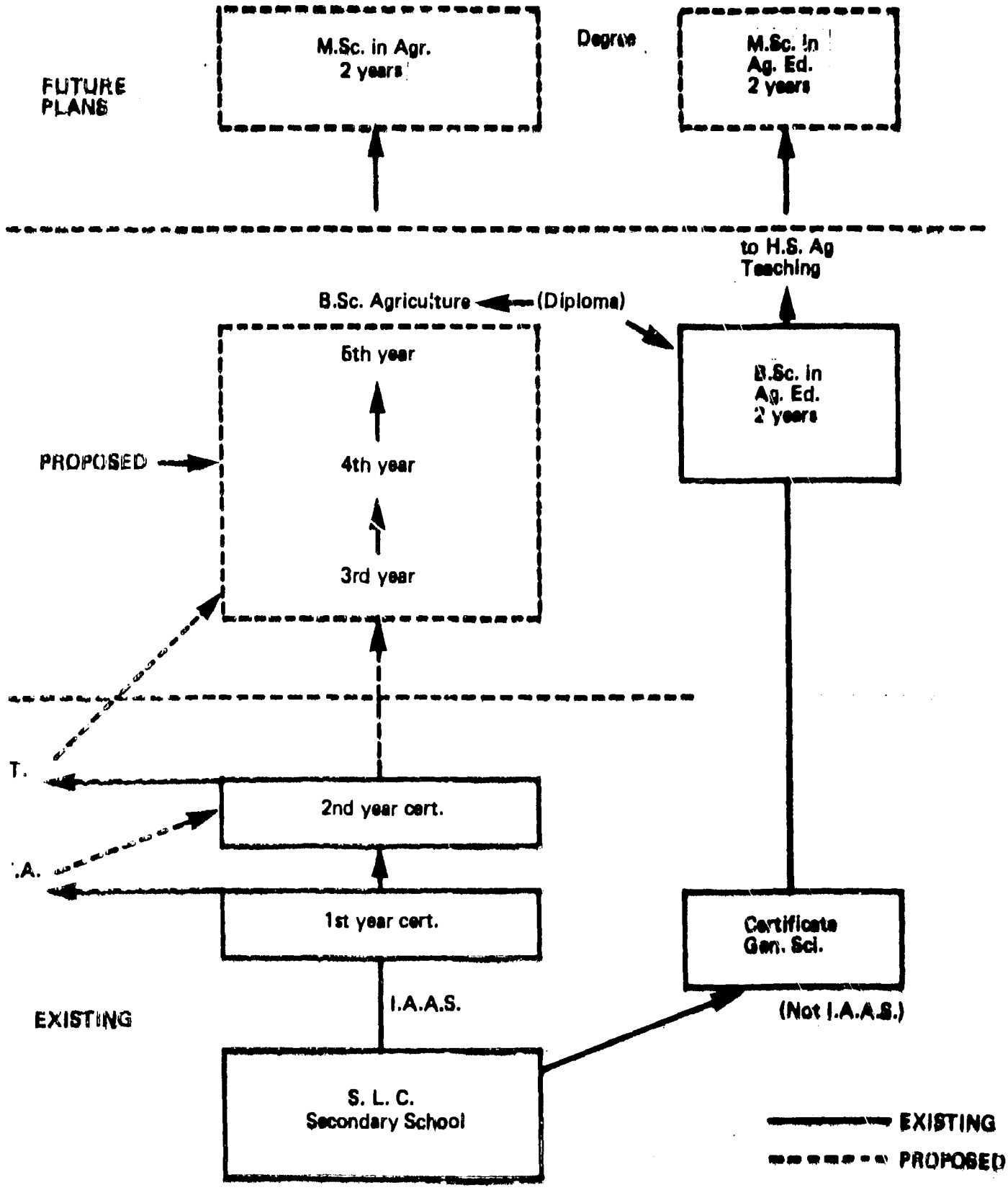
Subject Matter Areas	Credits
A. Agriculture	35
B. Math, Chem., Bot., Zoo.,	10
C. English, Nepal Gov't.	3
D. Electives	2
Total	50

The present two year certificate course has a common program for the first year with provisions for some seven different majors in the second year, although not all majors are being offered (veterinary science and fishery science). The first year consists of:

Subject Matter Areas	Credits
A. Agriculture	None
B. Science (Biol. & Physical)	35
C. English and Social Studies	16
D. Electives	4
Total	55

This is obviously a heavily science oriented program with one year each of Chemistry, Physics, Botany, Zoology, and Mathematics. The second year of the two year certificate program requires an additional four to fourteen credits of science and 35 to 43 hours of agriculture. For example, the Major in General Agriculture requires an additional semester of Mathematics, an additional year of Chemistry (Physical and Inorganic, and Organic) and one additional semester of Botany (total 12 credits) plus an additional semester of English. The major in Agriculture Extension has the same requirements except that physical and inorganic Chemistry is not required.

PRESENT AND PROPOSED PROGRAMS AND FLOW CHART



One cannot help but note also that a program which requires 55 semester credits in one year (two semesters) is either an uncommonly heavy study load, or an overly generous allowance of credit or both.

Using these same two majors as examples of the two year certificate program, the subject matter area requirements can be summarized as follows:

	Credits	
	General Agriculture	Extension
A. Agriculture	37	40
B. Science (Biol. & Phys.)	47	44
C. English & Social Science	18	18
D. Electives	8	8
Total	110	110

I had heard and read much in the MUCIA report of the need for practical and applied education in agriculture. I had seen and admired the student plots of fine looking wheat upon my arrival at the IAAS. I, therefore, found it difficult to believe that the IAAS had moved physically from Kathmandu to Rampur with a 300 acre campus but had not moved from a science based, classroom lecture, theoretical type program to one more closely exemplified by Dean K. B. Rajbhandary's concepts that "unless and until the teacher does the practical work himself, and with his own hands he should not teach", and "until the student does the practical tasks himself, with his own hands, he is not likely to learn."

Here again the recommendations for higher education in Agriculture in Nepal are well set forth in the MUCIA report, Chapter III.

The curriculum for a B.Sc. (diploma) in Agricultural Education is based on a background of a two year certificate in general science (no practical agriculture -- in fact no agriculture). The first year is a common program as follows:

Subject Matter Area	Credits
Vocational Education in Agriculture	8
General Ed. (English & Nepali)	6
Agriculture	36
Total	50

In the second year, students may elect one of the following majors: Poultry, Agronomy, Horticulture or Animal Husbandry. Each major requires identical courses in Vocational (Agricultural) Education totaling 16 hours, bringing the total professional teacher training hours (including student teaching in agriculture) to 24 in the two year B.Sc. program. Likewise each major requires a specified list of 34 hours of agriculture courses (varying with the major) for a total of 70 hours of Agriculture for the diploma.

This program appears to be functioning well. A great deal of the credit is due to the effort and dedication of Professor Merril B. Asay, USAID. However, if the IAAS is to be the Agricultural training center and if these graduates are to have the essential background of practical agricultural experience, this program needs to be shifted to the same two year certificate in agriculture track. (See Agricultural Education major in proposed five year program.)

PROCEDURES FOLLOWED IN DRAFTING REVISED CURRICULUM

After gathering all information I could, in the short time available, about the present curricula and courses, I was fortunate to have an opportunity for several conferences with Dr. Burton Newbry who visited the IAAS campus on April 8 and 9. The master campus plan was also reviewed with Mr. David Teidt, AID/Washington, and Mr. Donald Reese, AID/Nepal both of whom visited the campus on April 10 and 11.

In discussions with Dr. Newbry it was agreed that:

1. There should be one track for all students, including Agriculture-Education, in the first two years, with some room for electives in the fourth semester.
2. Since I had no way of knowing the facilities for, or quality of instruction, at the five satellite campuses, it was agreed that the curriculum should be planned for the IAAS campus. If the practical experience of one or two semesters could be offered at the satellite campuses, well and good.
3. The first semester should be devoted to practical (on the job) experience involving the arts and skills of agriculture.
4. The second semester should include a continuation of practical experience with some introduction to the applied sciences.
5. Some electives (or course substitutions) in the fourth semester could make it possible to prepare:
   A. Pre-forestry students.
   B. Pre-veterinary students.
6. The first two years should provide a base of both practical agriculture and applied science for those who do not go beyond the so-called J.A. level, but should also prepare the better

students to go on to the 3rd, 4th, and 5th years for a B.Sc. in Agriculture.

Upon Mr. Geri's return to the campus on May 9, I held discussions with him and with Mr. Sharma regarding an appropriate program and courses for the first two years. The three of us appeared to be very close in our thinking and philosophy. I then prepared a draft proposal for the first two years and in a meeting with Mr. Geri on May 10, we made a few minor changes. My wife then typed copies for distribution to the faculty. I met with some sixteen faculty members on Sunday, May 13. I explained my philosophy briefly as follows:

1. We must start with where the students are.
2. We must provide for the best possible practical training and preparation for the first and second year and at the same time provide a foundation for the 3rd, 4th, and 5th year for those selected to go on.

I then asked each faculty member or discipline area to do two things.

1. Prepare a concise but accurate paragraph description statement for each course listed in the first two years, and,
2. Prepare a topical outline for each course.

I also recommended that three areas work together to review and criticize the course descriptions and outlines. For example: crops, animal science, and extension; chemistry, animal science and soils; etc. I felt this would not only save time but acquaint other areas with the course proposals. In addition, I had hoped it would permit the agriculture staff to contribute to the preparation of agriculture oriented courses in the sciences such as botany, chemistry, mathematics, physics and zoology.

This was a vain hope since I was working with a young faculty which had apparently never had experience in academic planning, working with individuals from another discipline, or having their course reviewed or criticized by others. A typical reaction was "Nobody else is qualified to criticize my course". I challenged this with, "I am, I can, and I will" and that's exactly what happened in the end. Most, though not all, worked hard at preparing a concise course description and topical outline. Some diligently rewrote their descriptions after I had reviewed them and made suggestions, emphasizing the need for practical experience courses in agriculture and agriculture oriented science courses. On the other hand some staff members refused to rewrite what clearly appeared to me to be advanced level theory and philosophy courses, telling me if I didn't like what they had prepared I could do it myself. In the absence of the Dean, I could only point out to such individuals that they were members of the staff of the IAAS and as such had certain responsibilities. To those who wished to emulate other institutes I pointed out that the IAAS is a unique agriculture school with urgent unique functions and could not accomplish its mission by copying course descriptions from the catalogs of Indian Universities or even Tribhuvan.

THIRD, FOURTH, AND FIFTH YEARS

While the above process was going on, Mr. Gexi and I each prepared our own listing of proposed courses for the third, fourth and fifth year program leading to a Bachelor of Science in Agriculture. When we compared our two lists, we found them amazingly similar.

I had discussed the Agricultural Education track with Mr. Merril S. Asay on several occasions and we both agreed that it should be phased out as soon as possible. The Agricultural Education students would then follow the same track as all others for the first four years and then specialize in vocational agriculture in the fifth year. This would not only give these students a better practical agricultural experience background but would lead to greater efficiency in course offerings.

It is assumed that only a selected few of those who complete the first two years will be admitted to the three year diploma program, perhaps 15 to 25%, though this is not yet a fixed figure. Upon satisfactory completion of the two year certificate program, graduates will be qualified for many intermediate level jobs such as J.T.'s--Extension workers. Whether or not they will accept extension positions will depend upon the salaries, perquisites, and living conditions. This is a policy matter to be settled by His Majesty's Government.

The curriculum, for those admitted to the diploma program, can and should build on the practical, applied agriculture, and science base of the first two years. At this point it seems logical that the third and fourth years should be a common program. Student numbers in each batch will of necessity be small, therefore each class will be small, say 20 to 25 students. With these numbers, the Institute cannot affort to proliferate its course offerings.

Electives in the fifth year will provide for ample specialization at the present time.

If and when, for example, it is decided to attach a division or department of forestry to the IAAS, students opting for this major or diploma, would need a different set of courses, (Introduction to Forestry,

Forest Ecology, Forest Dendrology Forest Measurement, Wood Utilization, Forest Resource Management, Forest Economics, Forest Entomology, Forest Tree Diseases to name the major ones) during the last two years of the five year program.

A first draft of the full five year degree programs was presented to the faculty on April 16. I pointed out that I did not expect final approval since I assumed this would require official action by the Dean, and the faculty, possibly Tribhuvan University, and the Minister of Education.

Little real discussion ensued but some useful suggestions for the shifting of the sequential offerings of courses were made.

It is obvious that while some faculty members have seen the MUCIA report, not all are familiar with it -- let alone in sympathy with it -- and more faculty meetings are needed for discussion of objectives of the reoriented curriculum and long range planning for the IAAS.

PROPOSED COMMON 1 and 2 YEAR CERTIFICATE PROGRAM

INSTITUTE OF AGRICULTURE AND ANIMAL SCIENCE

Rampur, Nepal

FIRST YEAR

FIRST SEMESTER

ARTS AND SKILLS OF AGRICULTURE 1/

Subject	Lect. & Disc. Hrs.	Pract. Work Exp. Hrs.	Credit Hours
General Crop Production Experience 2/	2	4	4
Agronomy--Soils, types, preparation, etc.	2	4	4
General Fruit & Vegetable Production Experience	2	4	4
Plant Protection--in field, and storage, Diseases, Insects, Rodents, Weather, etc.	2	2	3
General Livestock and/or Poultry Production Experience	2	2	3
Introductory Agricultural Extension 3/	2	4	3
Use of Tools and Implements	1	2	2
Lay Out of Land (Including Water)	1	2	2
Total	14	24	25

1/ The first semester should provide a maximum of practical experience under the guidance and supervision of qualified staff. That is, it should provide "on the job training and doing" in the areas listed, and should consist of approximately two hours work experience for each hour of lecture-discussion. To paraphrase Dean Rajbhandary, "Most of what I hear, I forget; much of what I hear and see has little real meaning and is easily forgotten; what I do myself, I know and remember."

2/ Crops of the Area--at least two or more.

3/ If the extension staff is unable to devise an introductory practical experience course for the first semester, this course could be omitted or moved to the third semester.

PROPOSED COMMON 1 and 2 YEAR CERTIFICATE PROGRAM (cont.)

SECOND SEMESTER

APPLIED SCIENCE AND AGRICULTURE

Subject	Lect. & Disc. Hrs.	Lab. & Practical	Credit Hours
Fundamentals of Crop Production	3	2	4
Introductory Plant Pathology I	3	2	4
Horticulture Production I--Fruits and Vegetables	3	2	4
Elementary Agricultural Entomology	2	2	3
Animal Husbandry (Gen. Livestock Management, Cattle, Goats, Hogs, and/or Poultry	3	2	4
Practical Agriculture Mensuration	2	2	3
General Applied Botany	2	2	3
Total	18	14	25

The second semester is designed to combine courses in practical agriculture, (thus leading naturally from the first semester of practical experience) with some introductory courses in the sciences.

The applied and practical agriculture courses are a natural follow-up to similar experience courses of the first semester.

Botany is placed in the first year due to its greater importance and relevance to a crop oriented agriculture than is zoology.

Practical Agricultural Mathematics is placed in the second semester to give both terminal and continuing students experience in weights, measures, and measuring (land, building, areas, etc.).

SECOND YEAR

THIRD SEMESTER

INTRODUCTION TO BASIC SCIENCES

Subject	Lect. & Disc. Hrs.	Pract. Hours	Credit Hours
Agronomy in Nepal	3	0	3
Cereal Crops	1	2	2
Introduction to Agricultural Mechanics	1	2	2
Basic Algebra and Trigonometry	3	0	3
General Chemistry I	2	4	4
English	3	0	3
Nepal Rachna	3	0	3
Nepal Parichaya	1	0	1
Total	17	8	21

The Introduction to Algebra and Trigonometry would be a practical, useful course as a follow up to Practical Agricultural Mathematics. It will be helpful in understanding Chemistry, Physics, Nutrition and Agricultural Mechanics.

Both the General Chemistry and its sequence course should include the fundamentals of Chemistry and application to Agriculture, i.e. nutrition, soils, fertilizers, insecticides, etc. This will require that staff members in these disciplines work with the Chemistry teacher to develop an appropriate course.

I have serious doubts of the need for two semesters or even one semester of Physics in the first two year common program. As an alternative I suggest a one semester general introductory course in the third year upon which a second course can be based for students interested in pre-veterinary medicine, agricultural mechanics, forestry, or food processing, if and when these areas are developed as a part of the Institute's responsibility. Those who wish to go on for graduate work in certain areas may elect the second course.

FOURTH SEMESTER

Subject	Lect. & Disc. Hrs.	Lab. Hours	Credit Hours
General and Organic Chemistry II 1/	3	4	5
Introduction to Agricultural Economics	3	0	3
Principles of Dairy Cattle Management	3	2	4
Principles of Plant Pathology	3	2	4
Electives			8-9
Total			24-25

If programs are developed in the following areas the courses listed below would be required for the area indicated.

Other courses required for Pre-Veterinary or Pharmacy:

Organic Chemistry (May be substituted for Principles of Plant Pathology)	(3)	(2)	(4)
Physics I (third semester in substitute for Agron. in Nepal and Agr. Mech.)	(2)	(4)	(4)
Physics II (fourth semester)	3	4	5
Animal Feeding and Nutrition	3	2	4
Total			25

Required for Forestry:

Physics I (third semester in substitute for Agron. in Nepal)	(2)	(4)	(4)
Physics II (fourth semester)	3	4	5
Soils and Geology	2	4	4
Total			24

Required for Agricultural Mechanics:

Physics I (third semester in substitute for Agron. in Nepal)	(2)	(4)	(4)
Physics II (fourth semester)	3	4	5
Farm Tools and Machinery	2	4	4
Total			26

1/ Approximately one half of the General and Organic Chemistry course should be devoted to Organic Chemistry.

PROPOSED BACHELOR OF SCIENCE PROGRAM IN AGRICULTURE

INSTITUTE OF AGRICULTURE AND ANIMAL SCIENCE

Rampur, Nepal

THIRD YEAR

First Semester		Second Semester	
Subject	Credit	Subject	Credit
Soil Fertility and Management	4	Soil & Water Conservation	4
Plant Physiology	3	Plant Diseases	3
Animal Feeding and Nutrition	4	General & Cash Crops	3
Microbiology	3	Advanced Livestock Mgt.	3
General Zoology	4	General Entomology	3
Applied Agr. Physics I	4	Milk & Milk Products	3
Total	22	Total	19

FOURTH YEAR

First Semester		Second Semester	
Subject	Credit	Subject	Credit
Forage Crops	2	Adv. Vegetable Production, Harvesting, & Proc.	3
Management of Fruit Trees and Ornamentals	3	Livestock & Poultry Diseases	4
Entomology-Pest Control-Field and Storage	3	Plant & Animal Genetics	4
Poultry Management	3	Agr. Mkt. & Mgt.	3
Fisheries	3	Gen. Agr. Mech., Power & Mach., Soil & Water Conserv. & Control, Farm Structures & Rural Electrification	3
Agricultural Education and Extension	3	Student Project	3-4
Applied Statistics	3	Total	20-21
Total	20		

FIFTH YEAR

POSSIBLE MAJORS

First Priority	Second Priority
Agricultural Education	Animal Science
Agricultural Extension	Horticulture Crops
Crop Production & Protection	Agricultural Mechanization

TEAMS ASSIGNED TO PREPARE PARAGRAPH DESCRIPTION OF COURSES AND TOPICAL OUTLINES

A. Crops
Animal Science
Extension

B. Soils
Entomology
Plant Pathology

C. Horticulture
Agricultural Economics
Plant Protection

D. Agricultural Engineering
Agricultural Education
Agricultural Extension

E. Mathematics (2 courses)
Agricultural Engineering
Agricultural Economics

F. Botany (1 course)
Crops
Horticulture

G. Chemistry (2 courses)
Soils
Animal Science

H. Physics (1 course)
Soils
Agricultural Engineering

I. Zoology (1 course)
Animal Science
Fisheries

As noted earlier, this approach was not effective, but is still a good method for "pooling of knowledge" from various disciplines when done properly.

In conclusion, I could give my rationale for the sequences and placement of courses in the third and fourth years, but in the interest of saving space and time, I'll mention only a few. (1) Microbiology is placed ahead of Plant Diseases and Milk and Milk Products for obvious reasons; (2) Animal Feeding and Nutrition follows General and Organic Chemistry of the second year; (3) Some staff members argued for biochemistry to be included concurrent with nutrition but experience tells me it is not necessary, although it may be offered as an elective in the fifth year; (4) Agricultural Education and Extension is intended to be a joint course and a "first professional course" for students who may major in either area.

IMPLEMENTING THE NEW PROGRAM

Assuming the proposed new academic plan is approved, even with minor changes in courses or sequences, it is recommended that the following steps be completed before the program is implemented:

1. The faculty must have a complete understanding of the concept and philosophy of the curriculum and hopefully a receptive attitude. Emphasis in the classroom must be placed on practical training, utilizing the "learning by doing" philosophy of education, especially in the first year.
2. Detailed attention must be given to the completion of course descriptions, topical outlines, time to be devoted to each topic, laboratory exercises, credit hours, and appropriate texts or reference assignments. First priority for this should be given to the first year courses, then to those listed for the second year, and so on. Some examples are attached. (See Appendix II.)

3. An Associate Dean for Academic Affairs (or Resident Instruction) should be appointed with full responsibility and authority to carry out steps one and two above and to provide continuing supervision of, and improvement of instruction.
4. Assuming that an AID contract is signed with HMG, an AID counterpart to the Dean and Associate Dean should provide continuing review of the implementation of the new curriculum, subjects, and teaching methods.
5. There should be an annual review for the next five years by a professional academic planner, with the first review to take place approximately 14 or 15 months after the new program is implemented. This could be done on a short term assignment of approximately two weeks.

CONCLUSION AND EXPRESSION OF APPRECIATION

Rampur is not a bustling metropolis like Kathmandu. Yet it is a pleasant valley with great natural beauty, healthy environment and scenic views of the Ganesh Himal range and the Annapurna range to the north. It is located only 15 miles from the famous National Game Preserve at Tiger Tops. It is in a fertile valley with great agricultural potential.

With adequate academic buildings, student and staff housing, a well qualified and dedicated staff, and curriculum appropriate to its objectives, the IAAS can become a fine educational center for future Agricultural leaders of Nepal.

It is difficult to name all those who assisted me in this project, without omitting some who should be named. However, I want to express my appreciation to Director Charles Grader, Dr. Burton Newbry, Dean K. B. Kajbhandary, B. N. Sharma, Tej Prasad Giri, Professor H. James Miller, Mr. David Teidt, Mr. Don Reese, Dr. Merril B. Asay, Mr. C. P. Smith, Mr. Ganga Prashad Acharya, and all the staff members of the IAAS who cooperated and assisted with the project.

APPENDIX I

ESTIMATE OF LABORATORIES (BY TYPES) AND CLASSROOMS NEEDED IN PHASE I (1978 Completion)

Arts and Sciences Building

Chemistry	1 Lab.	
Zoology	1 "	Capacity per lab. = 25
Botany	1 "	
Physics	1 "	
Total	4	

Specialized Agriculture Laboratories

For Crop Sciences	3	Capacity per lab. = 25
For Animal Sciences	2	
Total	5	

General purpose (anonymous) classrooms for all courses

Size	Number
30	8
60	6
120	2
Total	16

The above are needed for the two year certificate program. Expansion must be provided for the proposed new degree program. This is provided for in Professor Miller's Campus Plan. Each teaching lab will need an appropriate storeroom and preparation room.

With the help of Mr. Sharma, an estimate was prepared to show the specific personnel and functions that would ultimately be housed in the General Administration Building. This list includes some thirty people, and a comparable number of rooms. This does not mean one room per person, but includes such rooms as a conference room, fireproof record room (vault), storage rooms for the procurement officer, etc.

After the completion of Phase I construction, it appears feasible to use the present administration-office-classroom building for administrative purposes.

APPENDIX II

Some samples of proposed course descriptions and topical outlines are included here as an example of what was done by interested and cooperative staff members.

Course descriptions and topical outlines were completed for most courses of the first two years. However, to include all of them here would practically constitute a college catalog which is not the purpose of this report.

I have copies of most course descriptions and topical outlines for courses of the first two years (some typed and some handwritten). A few had not been completed when I left.

It is my understanding that Mr. Giri also has copies at the IAAS. Assuming that most of the curriculum proposal is approved, these should be a valuable guide for the administration, staff, and future consultants.

GENERAL CROP PRODUCTION EXPERIENCE - 1ST SEMESTER - 4 HOURS

Designed to provide maximum practical experience in crop raising technique based on "Learning by doing" principle. Includes improved cultural practices on major field crops such as rice, wheat, corn sugarcane, tobacco, cotton, jute, mustard.

Practicals: Identification, uses, handling, care and maintenance of working implements, identification of crop plants, seeds, fertilizers, manures, regular and timely cultural operations in the field. Frequent visit and recording observation on standing crops.

AGRONOMY (SOILS) - 1ST SEMESTER - 4 HOURS

Study of the characteristics of the soil types of the locality, tillage and seedbed preparation, time method, depth, number and frequency of different operations in relation to soil type, moisture content, types of crop to be raised. Preliminary knowledge of soil reactions. Significance of time and methods of irrigation and drainage, knowledge of plant nutrient elements, deficiency symptoms, source of availability, schedule of application.

Practicals: Identification of soil types, classification, study of soil structure, color, conservation techniques like bunding, digging, compost and manure - bits layout of the field.

PLANT PROTECTION - 1ST SEMESTER - 3 HOURS

Principles and methods of crop protection; Use care and maintenance of crop protection equipment; Definitions, importance, uses and classification of insecticides and fungicides. Formulation of insecticides and fungicides. Important pesticides used in Nepal. Estimation of insect pest and plant disease losses. Identification of insect pests and plant diseases of field crops and stored grains.

Practicals: Identification of insect pest and plant diseases in the field; Identification of pesticides. Preparation of Bordeux mixture. Preparation of baits for insects and rodent control. Collection and preservation of Herbarium. Field trips and assignments.

ELEMENTARY AGRICULTURAL ENTOMOLOGY - 2ND SEMESTER - 3 HOURS

Insects and their dominance as a group in Animal Kingdom. General structure of insects, external and internal morphology with special reference to grasshopper. A general account of digestion, circulation, respiration, nervous, reproductive systems and special sense organs of insects. Insect classification with special emphasis on orders and families of agricultural importance. Study and control of important crop pests of Nepal.

Practicals: Dissection of grasshopper and beetle for different internal systems. Study of the insect-pests belonging to the orders and families of agricultural importance.

PRACTICAL AGRICULTURAL MENSURATION - 2ND SEMESTER - 3 HOURS

Different units of measurement and weights, their definitions and conversion into one another. Measurement of area of different shapes of land and wall. Measurement of surface area and volume of rectangular solids and cubes, the right circular cone, the sphere (with the applications of agricultural materials), the right prism, the right circular cylinder. Quizzes.

INTRODUCTION TO AGRICULTURAL ECONOMICS - 4TH SEMESTER - 3 HOURS

Definition of agriculture economics. Importance of agriculture in the national economy of Nepal.- Demand and supply - inputs and outputs. Basic economic principles of production, agriculture marketing, national agricultural policies. Simple record keeping and accounting.

TOPICAL OUTLINE FOR INTRODUCTION TO AGRIC. ECONOMICS

		Lectures
1.	Introductory idea of agriculture economics.....	1
2.	Importance of agriculture in the national economy - export and employment.....	1
3.	Definition of demand; Law of demand and its exceptions.....	3
4.	Definition of supply; Interaction of demand and supply; Equilibrium price.....	4
5.	Agricultural inputs and their characteristics; simple input-output relations in agriculture.....	4
6.	Basic economic principles of production.....	5
7.	Simple farm record keeping and accounting. Different types of simple but useful records.....	4
8.	Effect of price variations in agric. production; role of efficient marketing system in increasing productivity; marketing systems of Nepal; special marketing systems and special problems of agric. marketing.....	10
9.	Aims of agric. policies; understanding of the existing agric. policies of the country; desired improvements.....	4