PD - ABD - 582

TIPAN

Transformation and Integration of the Provincial Agricultural Network

Northwest Frontier Province, Pakistan

Office of International Agriculture
University of Illinois at Urbana-Champaign

In collaboration with
Southern Illinois University at Carbondale

PD-ABD-582
ISN 75049

CONSULTANT REPORT

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AN ASSESSMENT OF VARIOUS ASPECTS OF THE TEACHING PROGRAM OF THE AGRICULTURAL UNIVERSITY, N.W.F.P.

OCTOBER 3 - NOVEMBER 13, 1991

Submitted to the
Northwest Frontier Province
Agricultural University
Peshawar, NWFP, Pakistan

and

the U.S. Agency for International Development
Mission to Pakistan

A Report of Contract 391-0488-C-00-5001-00
The Transformation and Integration of the Provincial
Agricultural Network (TIPAN) Project

by

Office of International Agriculture
University of Illinois at Urbana-Champaign
Southern Illinois University at Carbondale

Preface

Since I served on the TIPAN Project Design Team in Peshawar in 1983, with the responsibility of coordinating the revision of the instructional program at AU-NWFP, it is indeed a pleasure and a privilege to return eight years later to assess the instructional program as it has evolved, and to make recommendations for further improvement.

Obviously, it is a source of great satisfaction to observe that much of the 1983 plan has been implemented, including some items which were thought to be radical or controversial.

However, the 1983 vision is not yet fully realized. Some of the problems identified in 1983 persist. In other cases the attempted solution to one problem may have caused another problem to surface. Thus it is appropriate that the Academic Council of the University suggested that a consultant review the instructional program and make recommendations for improvement. This report is the result of that activity.

I am grateful to the many persons who contributed information, materials and ideas which provided a basis for the evaluation. I am particularly indebted to Dr. Everett Edington who sent AU curriculum materials to me for review in preparation for my trip to Peshawar and who has provided constant assistance and support during the time I have been at the AU. His assistance has greatly enhanced the efficiency of my activities.

I met with Vice Chancellor Abdur Rahman Khan; Director of Teaching Hafiz Inayatullah; the Dean and Respective Department Chairman of each of the Faculties; the TIPAN TAT Team, both as a group, and on several occasions individually; students consisting of nominees from the various deans; and many faculty members and students, both as individuals and in small groups. I attended a meeting of the Academic Council, the meeting of the Pakistan Weed Science Society conference and a student-directed seminar on drug abuse. I also talked to a group of students who were protesting outside the office of the Director of Teaching concerning their mid-semester examination.

I hope that the information and perceptions which I gained from these personal contacts and from the various printed references which were consulted is a representative sample for the entire University, and that the analysis and resulting recommendations can lead to further improvement in the teaching program and the overall stature of the Agricultural University.

This has been a challenging assignment; my thanks to all who helped to make it also a pleasant and rewarding experience.

EXECUTIVE SUMMARY

This report assesses the instructional program at the Agricultural University, NWFP, and makes recommendations for its improvement. The report reviews the observations which were made and lists, in bold print, the resulting recommendations.

Each of the first nine recommendations is for a small change in the structure of the undergraduate curriculum. The combined result is to strengthen the science/math component of the general education requirement, to accommodate the addition of Water Management as a specialization, to give greater flexibility in selecting elective courses in year three and to provide a revised format in which to list the requirements for each of the four years.

The second part of the report identifies and discusses several aspects of the instructional program which are going well, including: the adoption of the semester system and defining in a novel way the academic year; the admission of FSc pre-engineering students to the University; the admission, graduation and placement of women students; the strengthening of the general education requirements; a greatly improved library collection and data base; the extensive building construction program; and the large number of returning participant trainees, with some examples of their contributions and involvement.

The third part of the report identifies and describes some aspects of teaching-program implementation which need modification. Seven of these items, identified as A through G, pertain to academic accountability, which is the most serious academic problem that the University has. Recommendations 12 and 13 address these issues. Other miscellaneous areas, which are of a less serious nature, but worthy of attention, are listed and briefly described in item H.

This report of the assessment of various aspects of the teaching program at the Agricultural University, N.W.F.P., Peshawar, Pakistan, is presented under the following four broad headings:

I. An assessment of the format or structure of the undergraduate undergraduate program, with recommendations for minor modification;

II. a listing and discussion of some aspects of program implementation which are going well;

III. a listing and discussion with recommendations of some aspects of program implementation which need improvement; and,

IV. a listing of references which can serve as resources for planning and conducting an on-going internal assessment of the of the teaching program.

I.A. THE FORMAT OR STRUCTURE OF THE UNDERGRADUATE CURRICULUM - FIRST TWO YEARS.

During the design phase of the TIPAN Project a new undergraduate curriculum was developed by the Agricultural University faculty members and the Design Team members working collaboratively. Virtually every AU faculty member was involved in the process; the large member of disciplinary specialists on the design team permitted detailed interaction with AU faculty members in the respective disciplines, departments or faculties.

The rationale for the content and structure of the undergraduate (BSc Honors) curriculum which was recommended in the Design Team's Report (June 28, 1983) is included on pages 17 through part of page 22 of that report, copies of which are included as Annex 1 of this report. Items a, e, f and h are germane to this current report.

OBSERVATIONS AND DISCUSSION

In 1991 the structure of the first two years of the undergraduate curriculum is basically the same as was recommended in the Project Design. Only one course has been deleted (temporarily suspended), the Seminar in year two. The English and Mathematics/Biology (Mathematics for FSc pre-med or Biology for FSc pre-eng) requirements have been increased a total of 11 semester hours, Plant Science II has been added, and Biochemistry has been changed from a third year elective to a second year requirement. The net addition of 16 semester hours among the four semesters of

the first two years has increased the average number of credit hours per semester to 20.

The requirement of either Mathematics or Biology depending on the student's intermediate (FSc) preparation being, respectively, pre-medicine or pre-engineering was incorporated into the project design to permit the admission of pre-engineering students (formerly only pre-medical students had been admitted to the University), and to provide appropriate intermediate-level courses for each group to compensate for the difference in the FSc preparation. It was assumed that after two semesters of intermediate-level instruction in the discipline (math or biology) which was not emphasized during the FSc program, the two groups would have equivalent backgrounds in mathematics and biological science.

During the intervening years a third semester of either mathematics or biology has been added, continuing the original plan of dividing the students on the basis of their FSc preparation. I have been told that the third semester course was added because it was perceived that after only two semesters of mathematics or biology, the students still lacked adequate background to make the desired progress in advanced subjects. This perception is supported by observing Graduate Record Examination (GRE) scores of AU participant trainees and noting that the mathematics scores tend to rank in the lowest decile.

The University is to be commended for broadening its admission policies to permit the admission of students from FSc pre-engineering. As one professor commented, this has increased the size of the pool of applicants. By taking the top students from two groups to fill the admission quotas, the cut-off score is now higher than if the quotas were filled from only one of the groups.

Also, the University is to be highly commended for the very significant increase in the amount of English taught in the first two years (original plan - 3 semester hours in the first semester only; currently - 2 semester hours in each of the four semesters of the first two years and then continuing the third and fourth year). This addition is significant not only from the point of view of quantity, but also from the point of view that the initiative for the change was internal. During the design phase of the project there was resistance to augmenting the general education requirements, through either broadening the scope or strengthening a discipline. No doubt the difficulty experienced by participant trainees in passing the TOEFL exam helped to change the perception concerning the need for additional instruction and experience in the English language.

To a short-term visitor the difference in the English language capabilities of students in 1983 and in 1991 is striking. The

students with whom I have had contact in 1991 have communicated rather freely in English. That was not the situation in 1983.

The Careers Seminar course was deleted (suspended) from the second semester of the second year because the teacher was over-committed. His teaching assignment for the Careers Seminar course was canceled to reduce his overall responsibilities, but there was no other appropriate faculty member to assume responsibility for the course.

Plant Science II, taught by the Horticulture Department, was added on the rationale that Horticulture had no introductory course in the first two years. The original intent of the design team was that the first semester course, Introduction to Plant Sciences (note the plural) be an introduction to both the Agronomic and the Horticultural Plant Sciences, using a team teaching, shared teaching or rotational teaching scheme, if necessary, to achieve the desired departmental representation.

I understand that the Faculty of Crop Protection Sciences now wants an introductory course added to the requirements of the first two years. The rationale for the proposed addition is to give the students more exposure to its disciplines before the students select their specialization.

A Water Management curriculum is currently being proposed. If it is approved it should become an integral part of the University's instructional program.

RECOMMENDATIONS:

Based on the above observations and discussion, the following is recommended concerning the structure of the curriculum for the first two years:

1. **Change the Mathematics/Biological Science requirements as follows:**

   a. **Reduce the divided instruction (Mathematics for FSc pre-med or Biology for BSc pre-engineering) from three semesters to two semesters, both in year one.**

   b. **In the first semester of the second year, require all students to take a Mathematics course (university level Algebra and Trigonometry) and a university level biological science course, permitting the students to choose between Botany and Zoology.**

   c. **Continue to require Statistics I in the second semester of year two.**

Recommendation 1 should result in a significant increase in the mathematics and science capabilities of the students at the end of year two. These benefits will accrue from:

a. Students from FSc pre-engineering will now study college algebra and trigonometry at the university level, and from an agricultural orientation. Currently they study no math except statistics.

b. Students from FSc pre-med will now take a semester of <u>required</u> university level biological science, taught from an agricultural orientation. Currently they are not required to take any basic biological science course.

The choice between Botany or Zoology will be the student's first opportunity to choose between two courses to fulfill a requirement. Since the choice will be made before a student has named her/his Specialization, the choice will be based on personal preference, and perhaps on information from "the student grapevine." It will also be recommended that either of the same two courses be permitted as an elective in year three, first semester, thus allowing a student to take both courses if desired, or to take the second course if it is specifically required by the chosen Specialization. The same recommendation will be made concerning biochemistry and physics.

2. Change the Physical Science requirement as follows:

Instead of requiring Biochemistry of all students in the second semester of year two, require one of the two courses: biochemistry or physics.

3. If the Water Management curriculum is added to the University program, <u>add the proposed two-semester-hour course, Introduction to Water Management, to the first semester, first term curriculum.</u>

Introduction to Computers is currently listed in the first year, first semester curriculum, but is actually taught in year three. Thus Water Management can be added without increasing the stated total credit hour requirement for the semester.

4. Restore the Careers Seminar course to year 2, semester 2.

Professor Hafiz has now been relieved of some of his former responsibilities and thus has the time and the desire to resume his leadership in this important component of the curriculum. This course is vital to an enlightened and rational choice by students concerning their potential careers, their planned internship and the appropriate specialization in years three and four.

To make room in the curriculum for the additional Mathematics/Biological Science requirement described in recommendation 1, and the resumption of the Careers Seminar course as described in recommendation 4, the following is recommended:

5.a. Move Pakistan Studies from semester 1 to semester 2 of year 2. This permits the math/bio science addition.

5.b. Move Animal Hygiene and Disease Control from a requirement in 2nd semester, year two, to an elective in year three. This permits the addition of the Pakistan Studies and Careers Seminar courses in the 2nd semester, year two.

6. List the revised undergraduate curriculum for the first two years as summarized in Table 1.

I.B. THE FORMAT OR STRUCTURE OF THE UNDERGRADUATE CURRICULUM - YEAR THREE.

OBSERVATIONS AND DISCUSSION

There is general criticism among Deans and Department Chairmen concerning the current structure of the curriculum for year three. The criticism focuses on the requirement that all students must choose one course from each of 3 (first semester) or 4 (second semester) groups of specific courses.

This structure was adopted during the Project Design phase to simplify the scheduling of classes (Annex 1, item h). Now that patterns of offering the required or suggested courses for each Specialization have been established, including the avoidance of potential conflicts in the schedule for courses which might be taken by more than one Specialization, the stated structure of the third year curriculum can be simplified by placing it in a different format.

Another modification needed in the third year of the curriculum concerns internships. The Project Design curriculum included required internship which would normally be done during the summer between the second and third years. It has been reported to me that the internship program has been suspended because of its high cost and also because many of the "internships" had become group tours rather than individual involvement over a period of weeks in a possible career-related or future employment-related activity.

It is extremely important that the AU include internships as a part of its instructional program. Internships can contribute to regional and national development through expanding the career

horizons of students, including the possibility of private employment and of entrepreneurship. Internships also help to promote linkages between the University and the community which can contribute to outreach opportunities, graduate placement, and student recruitment.

For more effective internships, the University should inform, counsel and encourage students to help them plan, participate in and report their respective internship experience. Following an internship, the University should assist the students, in consultation with an internship advisor (faculty member), to evaluate the internship as it relates to the total learning experience, the career choice and the student's personal and professional development.

The internship might be on a student's home farm, on a neighbor's farm, in an agriculture-related business or industry near the student's home or village, or it may be at a location which requires living away from home. It is important that the internship be a meaningful, career-related learning experience which will contribute to the student's capacity to effectively and successfully enter the job market upon graduation.

As stated previously, the Project Design recommended the internship period be during the summer between the second and third year. Since the academic year has been redefined to be a spring semester and a fall semester, with the intervening summer period, the appropriate recommended internships now would be the summer <u>during</u> the third year.

This is an appropriate time inasmuch as the student has made a specialization choice and has taken one semester of specialization courses in year three, thus the internship can be oriented to the implied career. However if the internship causes the student to re-evaluate the tentative career choice and specialization, it is still early enough for her/him to change the specialization (with appropriate permission or authorization).

Based on the above discussion of the format or structure of the third year of the undergraduate curriculum, the following recommendations are made:

7. In both the first and second semester,

a. Delete the listing of restricted-elective groups of courses, within which each student was required to choose one, and,

b. Add a statement that the student, in consultation with the departmental academic advisor, must choose classes totaling 8-10 credit hours from among the courses offered during the respective semester,

with the further provision that the selected courses must include at least one 500-level course from a department other than the student's specialization department.

c. Change the mathematics requirement by (1) deleting statistics as a specific requirement, and (2) adding mathematics (Advanced Mathematics or Statistics).

d. Permit students to include among the elected courses any 400-level course which is offered during the same semester, but which was not taken the previous year.

8. Each Faculty (currently there are 5) should choose one or more of its members to be coordinators and advisors for the internships of students in those specializations within the respective Faculty. These internship coordinators should work in consultation with the Director of Teaching and the Placement Officer (Director of Human Resource Development) in promoting, monitoring, and evaluating the internship program.

9. List the revised undergraduate curricular requirements for the third year, and the courses offered, as summarized in Table 2.

DISCUSSION

The above recommendation for changes in the structure of the third year portion of the undergraduate curriculum gives academic advisors and their student advisees greater flexibility in selecting specialization courses and appropriate supporting courses.

Also, the choice between two mathematics courses will permit specialization departments to work with the Mathematics Department to develop appropriate mathematics courses to follow university-level algebra and trigonometry, which might be a better alternative than Statistics for the respective specialization (Finite Mathematics, Calculus etc).

Note recommendation 7d. Until now, classes have been numbered by the year in which they are scheduled to be taken normally. Recommendation 7d will permit a student to take an elective course which was omitted in year two. Thus a student may, if recommendation 1 is approved, take both Botany and Zoology, and/or both Biochemistry and Physics.

I.C. THE FORMAT OR STRUCTURE OF THE UNDERGRADUATE CURRICULUM - YEAR FOUR.

10. Permit a student in year four to select any 500-level courses which were not taken in year three and which are appropriate Specialization courses, providing at least 30 credit hours of 600-level courses are completed.

The format of the fourth year undergraduate curriculum, with the above recommended change, is shown in Table 2.

II.B. ASPECTS OF PROGRAM IMPLEMENTATION WHICH ARE GOING WELL.

The University adopted the semester system as recommended in the Project Design and has been creative in redefining the academic year. The academic year was changed from a fall semester-spring semester sequence (approximately September to June) to a spring semester-fall semester sequence (January through May and September through December, with an intervening summer period). This is a logical and innovative definition of the academic year which eliminates the previous uncertainty and frustration of starting the first semester "sometime in September," depending on when FSc examination scores were posted so that the admission process could begin.

The admission of students from FSc pre-engineering, in addition to the previously exclusively FSc pre-med students, is extremely successful. Approximately 40% of the first year class is now from the pre-engineering group. The biology/mathematics option in the first year appears to have compensated for the difference in intermediate preparation. A modification of this biology/mathematics option, with additional mathematics and science required of all students, will strengthen the mathematics and biological science background of <u>all</u> students.

The admission of women students is a significant break with tradition. This change appears to have been accomplished very successfully. Evidence of the acceptance of this policy is that in addition to admitting women to fill the quota allocated to women, women are now admitted on merit into the non-quota category. During the 1991 year BSc part 1 has 12 women students. Total enrollment of women in the university (BSc through MSc) is 45.

11. When requesting nominations from the agencies or offices which nominate students to fill various quotas (geographic area, children of various groups, etc.), the University should stress that female students are admitted and that female graduates have been successfully placed in professional positions (the placement record for females, percentagewise, is currently better than the placement record for male graduates).

The general education program (general from both the universal and the agricultural view-points) in the first two years appears to be generally well accepted, as reflected by both the general education courses (English, math, science), and the introductory agriculture courses having been expanded beyond the original requirements.

One of the most dramatic changes at the University since 1983 is in the library. In a recent (April 1991) "Report of Perceptions of Graduating Students Concerning their Educational Programs (at the) University," the library received the highest rating among all items which the students evaluated (3.88 on a 5.0 scale).

The extensive construction project at the University is a harbinger of a greatly expanded and improved teaching-learning environment.

It is good to see AU faculty members taking leadership roles in national professional societies and the University hosting the National Weed Science Conference. This, at first glance, may seem to fall into the outreach facet of the University's three functions, but it also has strong teaching components particularly for the students who were involved in helping with the arrangements and those who attended. Dr. G.M. Khattak's inaugural address was inspirational. The video recording of this address should be viewed by current and future students in career planning and professional development seminars to help the students develop a sense of mission toward their respective careers.

The recently approved course in entrepreneurship is one of the most exciting items which came to my attention during this consultancy. Dr. Idris, and the Provincial Chief of Y.I.P.S. (Youth Investment Promotion Society) have developed a plan whereby fourth year BSc students or second year MSc students will participate in an entrepreneurship knowledge and skills development course and at the same time their applications for a Y.I.P.S. loan will be processed so that upon graduation the fledgling entrepreneur will have the know-how and the capital to initiate a business. This cooperative program between the University and Y.I.P.S. has great potential for promoting agricultural development and for improving the University's record in placing graduates in non-government jobs. A possible follow-up program for the new entrepreneur would be for the University to continue providing them instruction (a graduate level course taught in the evening in strategically located geographic areas to be accessible to the young entrepreneurs in exchange for the young businesses being sources of research and potential placement sites for future interns and graduates and as public ambassadors for the AU).

Another bright spot at the University is the large number of faculty members who have recently returned from their TIPAN participant training programs. Deans, Directors and Department

Chairs should carefully manage and utilize these personnel resources to gain the greatest benefit from their advanced training and experience.

III. ASPECTS OF PROGRAM IMPLEMENTATION WHICH NEED MODIFICATION

Perhaps the most serious weakness of the AU at this time is academic accountability. The reputation of a university becomes the identifying characteristic of its graduates, its faculty and its programs and degrees. Its reputation is the warranty which attests to the quality of its products. A university fails in its responsibility if it does not adhere to the highest standards of academic performance and accountability by faculty, administrators and students. Examples of current low standards of performance include:

A. Examinations and evaluation of students' progress.

Reference is made to the Fall Semester schedule for 1991, a copy of which is attached as Annex 2, and to the following statute items 14, 15, 16 and 17 of the Scheme of Studies for the Degree of BSc (Honours), as published in the 1989 Student Handbook:

14. Two examinations shall be held in the theory part of each course, one in the middle and the other at the end of the course, each covering half the course.

15. If the course includes a Practical, the practical examination shall be held once, at the end of the course.

16. Where the course does not include a practical, the two theory tests shall carry 50% marks each.

17. Where a course includes a practical, the practical shall carry 30% of the marks and the two theory tests, 35% each.

The fall semester schedule (see Annex 2) shows an 18-week semester beginning August 17 and ending December 19. With classes scheduled to meet 6 days per week, the gross number of "class days" is 108, but to determine the potential net number of teaching days one must subtract 6 (2 days scheduled for registration and 4 days as official holidays) leaving 102 days.

The schedule shows 20 days designated for examinations, thus, <u>officially,</u> 19.6% of the scheduled net teaching days are devoted only to examinations (no classes held on those days). But in practice the percentage is much higher. Because of the faculty strike the actual official date of the beginning of the mid-

semester examinations was changed to October 31. The day after the revised examination schedule was posted on the bulletin board students stopped attending classes to "study for exams," thus adding three "unofficial" days devoted to examinations.

Student protests, teacher strikes, teachers individually failing to meet classes and other disruptions further reduce the number of days that classes meet. On the first day of semester examinations, I talked to several students who were waiting to enter the auditorium. They said that their 3 credit hour course had met "13 or 14 times," which is equivalent to 4½ weeks of the possible 10 weeks or approximately 45% of the scheduled time. Academic accountability demands that a change be made.

When one takes into account that only 45% of the possible teaching days were devoted to teaching and that the examination period was, by student action, unofficially extended to 13 days, the percentage of class days devoted to examinations is greater than 30. Fall semester 1991 may have had more disruption than is normal and thus 30% may be a "worst ever" situation, but whether the percentage of class time devoted to examinations is "best possible" (19.6%), "worst ever known" (30%), or any percentage in between, it is more than can be pedagogically justified.

The current examination system is also ineffective in the potential positive features of examinations; i.e., student motivation and on-going evaluation to apprise both the teacher and the student of teaching-learning accomplishments. Recommendations:

12. Abolish the mid-semester examination period but continue the final examination period.

13. Under the revised system of examinations, the final examination in a theory course should count no less than 50% nor more than 75% of the course grade.

The remaining 25% to 50% of the course grade should be based on quizzes, in-class examinations, laboratory reports, projects, outside assignments, term reports, etc., as determined by the teacher to be the best way to assess student progress in the respective class, and as announced to the students at the first meeting of the class at the beginning of the semester.

In classes which include a practical, the grade for the practical portion may count no more than 25% of the total grade, distributed (as planned and announced by the teacher) between the on-going assessment and the final examination, with the further provision that the on-going assessment of the theory portion never be less than 25% of the course.

The above recommendations:

(1) reduce by at least 10 days the number of class days allocated to examinations, thus giving more time for teaching/learning;

(2) provide for a major portion of the grade to be determined in a traditional examination situation and with acceptable control of examination security;

(3) encourage student participation in class;

(4) put enough emphasis on class activities to discourage (perhaps eliminate) the practice of students never attending class; and,

(5) will help to change students' attitude that the only thing that is important is to make good marks on 2 major examinations and realize that they are being evaluated on their total performance in the course.

B. Another possible way to gain more accountability for awarding academic credit is to strictly enforce the existing statute, "In case teaching is suspended for some reason, the duration of the term shall be extended to the extent of the lost time;" and the regulation, "A student with less than 75% attendance in a course shall not be allowed to take an examination in a course."

C. A third breach of academic accountability derives from the current belief that, "The teacher can only cover on the exam those portions of the class which were taught in class." As one teacher said, "If the course was to cover 10 chapters, but because of disruptions only 2 chapters have been covered, the examination must be only on the two chapters; otherwise the students will protest." If students demand their academic reward (credits) under such circumstances, the University might record on the transcripts "Passed one-fifth of a course in _____ with a grade of B."

D. Grade inflation also lowers an institution's academic credibility. The currently used scale of percentage scores which corresponds to the letter grades is so low that every student expects an A, since an A is given for 75% or above. Once expectations have been raised to cause everyone to assume he/she will receive an A, if an A isn't earned it will be demanded.

One way to justify all A's to those who pass is to use criterion or contract grading whereby students are required to work until they achieve certain specified goals. Those who

can't fulfill the criteria or the terms of the contract are failed.

The AU policy of recording both the percentage score and the letter grade helps to maintain the academic credibility of the institution, but students tend to be more impressed by the letter grade, again giving them false expectations.

E. The inflated grading in the undergraduate program also has an effect on the MSc program. There is virtually no selectivity, on the basis of academic qualifications, for admission to the AU's MSc program. There are the same number of first year MSc students in 1991 as there were BSc graduates last year (119). Again, having achieved high grades in the BSc program makes the students "academically qualified," and the assumption is that if one meets minimum qualifications then one is not only qualified but entitled to the privilege. The University needs to reassess the admission policy for the MSc program. The Project Design suggested that only the top portion, perhaps 40%, of a graduating class be eligible for admission to graduate study.

F. A TOEFL score of at least 500 would also be a reasonable requirement for admission into an MSc program in which the medium of instruction is English.

G. Grade inflation also has implications for the proposed PhD program at AU. Before activating a PhD program, the University should establish PhD admissions policies which are comparable to other world class institutions which grant the PhD degree. This might include academic achievement at the MSc level with a GPA of no less than 3.25, <u>and</u> having graduated in the upper 50% of the MSc graduates. Currently one proposal suggests the admission requirement as 3.0 average <u>or</u> at least second division. With this criterion every MSc graduate at AU would meet the minimum admission requirements.

It also seems reasonable that admission to the PhD program include a required minimum TOEFL score (525 suggested as that minimum, at least at the beginning, but possibly advancing the minimum in increments until 550 becomes the minimum).

H. Other miscellaneous items which deserve attention:

(1) Inefficiency in utilizing resources.

(a) There is some evidence of duplication of courses among departments and within departments. Examples:

AgEc 601 Farm Management (4)4-1
Agron 704 Farm Management (4)5-1

AgEc 608 Quantitative Methods (4)4-2
AgEc 708 Quantitative Methods (4)5-1

AgCh 602 Physical Chemistry (4)4-2
SSic 608 Physical Chemistry (4)4-1

PBG 609 Intro to Chemical Weed Control
PPr 604 Weed Science and Technology.

(b) There is some evidence, from reading course syllabi, of possible duplication of course content. Some examples:

Agron 502 Plant Physiology
Agron 606 Physiology of Growth and Development.
Agron 608 Crop Physiology
Agron 702 Physiology of Crop Yield.
Agron 710 Physiology of Plants Under Stress.

At least 4 agronomy courses list seed germination as a practical.

Deans, Department Chairs and the Faculty, especially the teachers of possible overlapping courses, have a responsibility to coordinate the various course syllabi to avoid wasteful duplications or neglectful omissions in the teaching program.

(c) There are courses which, by their title, appear to be located in the wrong department.

Agron 704-Farm Management
PBG 609 Introduction to Chemical Weed Control.

(d) There appears to be some inefficiency in utilizing the talents, energies, and advanced training of some of the returning participant trainees.

2. The low rate of placement after BSc graduation is a concern. The Y.I.P.S. program previously mentioned has the potential of increasing both BSc placement, and placement in the private sector.

3. The limited library hours. (7:30 AM until 1:30 PM in summer or 8:00 AM until 2:00 PM in winter), the same hours in which classes are scheduled, does not foster student use of the library.

4. When assessing the potential of the Agricultural University, especially when contemplating a PhD program, one must remember that the "universe" of the Agricultural University is very limited. This can quickly be illustrated by stating that except for the one choice between math and biology in year 1, every student in the University takes every first and second year course offered by the University.

For a strong PhD program in agriculture, strong, research-oriented, supporting programs such as geology, physics, botany, zoology, economics, etc; are needed.

The AU may need to establish cooperative linkages with the University of Peshawar or other local institutions to have an adequate base for a first-rate PhD program.

5. There seems to be a lack of full acceptance by the faculty that development of the agricultural economy (both rural and urban aspects) and of the rural areas is a fundamental mission of the University.

6. The AU, NWFP should not compete with other agricultural universities in the country to require the greatest number of credit hours for a BSc degree. The value of a 4-year degree should be based on quality and quantity of credits, not on quantity alone.

IV. REFERENCES WHICH CAN SERVE AS RESOURCES FOR PLANNING AND CONDUCTING AN ON-GOING INTERNAL ASSESSMENT OF THE TEACHING PROGRAM

One of my planned goals for this consultancy, in addition to assessing the teaching program and making recommendations, was to work with the AU administration and faculty to help establish a plan and procedure for on-going assessment of programs within the departments and/or faculties. Time constraints have prevented me from accomplishing this goal. However, I brought several references to use in the above described activity and I will leave these references in the library so that they may be consulted as needed. The references are itemized in Annex 3.

N.W.F.P. AGRICULTURAL UNIVERSITY UNDERGRADUATE CURRICULUM
(Revised 1991)

Y E A R O N E

First Semester	credit hrs.	Second Semester	credit hrs.
Math, Intermediate for FSc pre-med OR	3	Math, Intermediate for FSc pre-med OR	3
Biological Science, Intermediate for FSc pre-eng		Biological Science, Intermediate for FSc pre-eng	
		Chemistry I	4
English 301	2	English 302	2
Islamic Studies I (IS 301) or (Ethical Behaviour)	2		
Orientation to Agricultural Professions (ENT 301)	1	Introduction to Agricultural Economics (Ag Ec 301)	3
Introduction to Animal Husbandry (AH---)	4	Engineering Applications to Agriculture (AM 301)	3
Introduction to Plant Sciences (Agron 301)	3	Animal and Plant Genetics (PBG 302)	3
Introduction to Water Management (WM---)	2	Plant Science II (HORT 301)	3
	--- 17		--- 21

Y E A R T W O

First Semester	credit hrs.	Second Semester	credit hrs.
Math (College Algebra and Trigonometry)	3	Statistics I (STAT 401)	3
College Botany OR College Zoology	3	Biochemistry (Ag Ch 401) OR Physics	3
Microbiology (PP 410)	3		
English 401	2	English 402	2
Islamic Studies II (IS 401) or (Ethical Behaviour)	2	Pakistan Studies (PS 401)	2
Soils (SSci 401)	3	Management of the Farming System (Ag Ec 402)	3
Agricultural Program Development and Implementation (EXT.ED 401)	2	Field Crop Production (Agron 401)	3
Animal Nutrition (AH 405)	3	Introduction to Food Technology (FST 401)	3
		Second Year Seminar	1
	--- 21		--- 20

YEAR THREE

First Semester	credit hrs.	Second Semester	credit hrs.
Statistics II (STAT 501) or advanced Math ---	3	Math/Statistics Math--- or STAT III	3
English III (Eng 501)	2	English III (Eng 502)	2
Islamic Studies III (IS 501)	2	Introduction to Computers (CS 501)	3
Introduction to Agriculture Communications (EXT ED 502)	3	Rural Sociology (Ag ECON 504)	3

Additional Courses which fulfill departmental requirements or student's interests. Must include at least one 500 level course from outside the student's department. A department may recommend that a student take the biological science elective which was not taken in year two or repeat a course which was failed in a previous first semester. 8-12 hrs

Courses taught in the first semester from which choices may be made:

AgEC 501 Ag. Dev Prob in Pakistan (3)
Agron501 Forage Production (3)
AH --- Animal Hygience and disease control
AH 501 Dairy Cattle and Water Buffalo Mgmt(3)
AH 510 Feeds and Feeding (3)
AH 517 Reproductive Physiology (4)
AM 501 Shop Practices
ENT 501 Intro. Entomology
FST 501 Raw Mat. Handling
FST 503 Chem. Effect of Processing Food
HORT 501 Principals of Hort.
PBG 501 Intro. of Plant Breeding Methods
PPr 501 Intro. of Crop Prot.
SSci 501 Soil Management
SSci 502 Soil Genesis and Class
WM 521 Soil, Water and Plant Relations
Math --- Advanced Math
Stat 501 Statistics II
PBG 303 Botany
--- --- Zoology

Additional Courses which fulfill departmental requirements or student's interests. Must include at least one 500 level course from outside the student's department. A department may recommend that a student take the physical science elective which was not taken in year two or repeat a course which was failed in a previous first semester. 8-12 hrs

Courses taught in the second semester from which choices may be made:

AgEc 505 Farm Accounting
AgEC 506 Microeconomics
Agron502 Plant Physiology
AH 502 Sheep and Goat Mgmt.(3)
AH 503 Poultry Mgmt.
AH 515 Animal Physiology
AH 520 Animal Breeding (3)
AM 502 Farm Power and Machinery
ExtEd503 Agri. Com Programs
FST 502 Food Safety and Environ.
HORT 502 Farm Forestry
PPr 502 Weed Science
Math --- Advanced Math
Stat 502 Statistics III
AgCh 401 Bio Chemistry
--- --- Physics

YEAR FOUR

First Semester	Second Semester

In the fourth year the student completes the selected specialization, the requirements for which are determined by the respective department. The courses, including specific requirements and the electives, are to be chosen in consultation with the academic advisor.
Each semester includes 14-16 credit hours of specialization courses and 2-4 credit hours of elective courses. Also in fourth year the student completes: Seminar for 1-2 credit hours; Review Paper for 1-2 credit hours; and Internship for 4 credit hours.

The elective courses may include any course taught at the 400 or 500 level, but not previously taken (Mathematics, Biological Science, Physical Science, or Statistics) as well as 500 and 600 level courses from outside one's department.

ANNEX 1

(This annex is copied from the Report of the Design Team, June 28, 1983, Pages 17 through 22)

4. The Rationale for and Special Considerations in the Content and Structure of the Recommended BSc. Basic Curriculum.

a. The solution to agricultural problems usually is not limited to applying concepts from a single discipline or narrow field of disciplines. Resolving a problem in livestock production may require the understanding or application of concepts from agronomy, agricultural mechanization, forestry, agricultural economics, rural sociology, and food technology - as well as the basic social, natural and biological sciences and even the humanities. The desirability of a wide breadth of agricultural knowledge is particularly important in Pakistan and especially the NWFP where geographic and climatic features present opportunities for such a wide variety of agricultural enterprises, not only in the Province in general but even on an individual farm. Thus, the educated agriculturalist, in addition to specialization training in a chosen discipline, needs broad training to have a general understanding of the whole range of agricultural knowledge and technology and how discipline-oriented concepts are inter-related and intra-active within the system.

b. There are some courses that have implied or specifically stated prerequisites and thus must follow a logical sequence. For example: mathematics precedes chemistry; chemistry precedes soils and animal nutrition; soils precedes crop production; biochemistry precedes animal hygiene and disease prevention and introduction to food technology.

c. The specified curriculum should include only a reasonable credit load per semester. The design team has limited the number of separate courses per semester to 16 and, in most semesters, the number of credit hours to 15. This per-semester limitation then limits the total BSc curriculum.

d. Some faculties have requested to have more courses from their respective disciplines included among the courses which are required of all students. The only way to increase the courses of

one discipline is to decrease the requirements in another discipline. Item a above gives the rationale for a balance among the disciplines in the initial two years, before specialization begins.

The Design Team's suggestion to those faculties which desire greater representation in the required courses is to gain that greater emphasis through quality of presentation rather than through additional quantity. For example, Plant Breeding and Genetics has requested to have included, among the required courses, a course in plant breeding so that all students "might have a proper appreciation of the importance of plant breeding in agricultural development."

It is recommended that the Faculty of Plant Sciences, particularly the teachers assigned to the four courses Introduction to Plant Sciences; Animal and Plant Genetics; Field Crop Production and Improvement; and Introduction to Crop Protection, all of which are required in the first two years, cooperate in planning the respective course syllabus to insure that a proper appreciation for plant breeding, as well as all other important introductory level concepts, is given adequate and balanced coverage, and to avoid unnecessary duplication and repetition. A similar recommendation is implied to other faculties and teachers of courses which contain interrelated subject matter.

e. A student should not be forced or enticed into making a choice of specialization which literally becomes a single track without opportunity to change, until: (1) the student has had a general introduction to all the specializations through course work, through academic advancement, and through personal investigation; and (2) the student has attained adequate maturity to understand the implications of the choice. The University has the responsibility to present the opportunity for choice; it is the student's prerogative to exercise that choice.

f. To provide a basis for reasonably unbiased advisement prior to the time a student must make a choice of specialization, two 1-credit courses are offered - one in Year I and one in Year II. These courses will provide information on agricultural career opportunities and on the specializations

which the University offers as a choice to the student. They will also, through personal presentations of persons in representative professions, give the students an opportunity to interact with potential role models before making a career choice and, in turn, the implied choice(s) of academic specialization.

g. In the past, the National Pay Scale regulations specified an MSc degree (of the type then granted in the NWFP-AU) for an agriculturalist to qualify for grade 17, the lowest professional grade. Thus under the University's "old" curriculum (the only curriculum which has thus far produced graduates) all students aspired to the MSc degree and very little selection occurred between the undergraduate program and the graduate program.

The "new" curriculum which the University is now using (but which will not produce BSc graduates until 1985) and also the curriculum recommended herein will culminate in a BSc degree which will qualify the graduate for NPS grade 17 employment.

Thus there will be a reduced compulsion for students to pursue an MSc and less reason for a liberal policy on admission to graduate study. This provides the basis for offering the two options in the fourth year; one for those students who anticipate entering career employment upon completion of the BSc degree; one for those students who desire, and have the academic ability, to enter graduate study or research.

h. A question was raised about the restricted electives in Year III. Why not simply say: "Choose any 3 of the following 13 electives?" The answer is: to avoid further complications in the scheduling of classes. In a 36 period per week academic schedule, it would be impossible to offer 13 3-hour elective courses, in addition to two required courses, so as to have no conflicts in the schedule and thus permit a student to freely choose three of the 13. As the electives were grouped (latter 2 groups), an attempt was made to include at least one course per group which is relevant to students pursuing each of the broad specializations as represented by faculty areas.

i. The required internship was included as a part of a more complete solution to the charge (by, among others, the Director of the Extension

Department, a major employer of the AU graduates) that the graduates "don't know how to do anything." One of the primary objectives of the internship is to give the student an opportunity to perform in an agricultural job or position. It will also give the student experience to which he/she can relate the past and future academic training. (See the special report on women in the NWFP-AU, specifically that portion of the report which relates to internships, and the section on Experiential Learning.) To further counter the charge of insufficient practical experience in the curriculum it is recommended that the "practicals" of all classes be, as the name implies, practical or real-life oriented and that opportunities for additional practical experience be provided through student employment programs, through special project electives, etc.

5. Length of Class Period

The recommended normal length of class period is 50 minutes, beginning on the hour and ending at 50 minutes past the hour. This would be the normal period for each lecture or discussion session. "Practicals" in laboratory, shop and field will normally be a double period, beginning on the hour and ending one hour and fifty minutes later, normally without a break.

6. Schedule of Classes

A schedule of classes by term and by class year for all classes included in the recommended BSc curriculum has been prepared. A room utilization program illustrating how each lecture hall, classroom, teaching laboratory, and teaching shop is to be used supplements the class schedule. Finally, a program has been prepared indicating the schedule of classes for each of the four faculties for the fall and spring terms.

These useful schedules are not incorporated into this volume; however, they will be available to the faculty and staff of the NWFP-AU and to the implementation team as the new academic program is initiated.

Annex 2

SCHEDULE FOR 1991

Fall Semester

August 17 and 19	Registration
August 20	All Classes start

Any student registering after this date will be charged late admission fee in accordance with the University Rules.

August 24	Last day to change classes
September 6, Holiday	Defence of Pakistan Day
September 11, Holiday	Death Anniversary of the Quaid-e-Azam
September 22, Holiday	Eid-i-Milad-un-Nabi (subject to sighting of moon)
October 5 - 15	Mid-Term Exams.
November 9, Holiday	Iqbal Day
December 7 - 14	Final Exams.
December 16 - 19	Practical Exams.
December 21 to Jan 2	Winter Holiday

Annex 3

REFERENCE MATERIALS RELATED TO CURRICULUM PLANNING OR REVISION WHICH I BROUGHT TO PESHAWAR FOR DEPOSITION IN THE LIBRARY

CURRICULAR INNOVATION FOR 2005. Planning for the future of our food and agricultural sciences, the North Central Curricular Committee Project, prepared and distributed by Higher Education Programs, Office of Grants and Program Systems, CSRS, USDA, Washington, D.C. Published by the University of Wisconsin, Madison, Madison, Wisconsin. 1989.

PROCEEDINGS, NATIONAL CURRICULUM REVITALIZATION - 2005 CONFERENCE. David J. Mugler, Conference Proceedings Editor, prepared and distributed by USDA, Washington, D.C. Published by Kansas State University, Manhattan Kansas.

SOCIETY OF AMERICAN FORESTERS SELF-EVALUATION REPORT, DEPARTMENT OF FORESTRY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, ILLINOIS, 1991.

An example or model of a self-study by a department as it evaluates its program in relation to institutional goals, objectives and policies.

EMPLOYMENT OPPORTUNITIES FOR COLLEGE GRADUATES IN THE FOOD AND AGRICULTURAL SCIENCES, AGRICULTURE, NATURAL RESOURCES, AND VETERINARY MEDICINE. K. Jane Coulter, Allan D. Goecker, and Marge Stanton. Prepared and published by Higher Education Programs, CSRS, USDA, Washington, D.C. 20250.

Presents updated statistical summaries concerning the availability of and employment opportunities for higher education graduates in the food and agricultural sciences. (U.S. data, but a model for a possible similar study in Pakistan).

PACE 80, PROCEEDINGS, PEOPLE FOR AGRICULTURAL COMMERCE THROUGH EDUCATION IN THE 1980'S. A national symposium for leaders in Agricultural Industry and Education.

PACE 80 was one of a series of national agribusiness symposia designed to bring together leaders from industry and education in a "summit" meeting to communicate changes, needs and concerns as related to trained and knowledgeable manpower being available for future growth, progress, and profit in the numerous areas of agricultural production, processing, marketing and service.

ACCOUNTABILITY OF HIGHER EDUCATION IN AGRICULTURE. Proceedings RICOP 1972 Summer Work Conference, Deans and Directors of Resident Instruction, National Association of State University and Land Grant Colleges, Montana State University, Bozeman, Montana.

SUPPLY AND DEMAND, COLLEGE GRADUATES IN THE FOOD AND AGRICULTURAL SCIENCES, A 1980 NATIONAL ASSESSMENT. Condensed Report, Allan D. Gaeckr, editor. Prepared for the Agricultural and Natural Resource Resident Instruction Committee on Organization and Policy of the National Association of State Universities and Land Grant Colleges.

GRADUATES OF HIGHER EDUCATION IN THE FOOD AND AGRICULTURAL SCIENCE. An analysis of Supply/Demand Relationships, Volume II - Home Economics, Science and Education Administration USDA, Miscellaneous Publication Number 1407, Washington, D.C. 1981.

A MARKETABILITY STUDY OF GRADUATES OF 1978, ILLINOIS AGRICULTURAL PROGRAMS OF HIGHER EDUCATION, FOR THE PURPOSE OF STUDENT AND PARENT ADVISEMENT, PROGRAM PLANNING AND PROGRAM CHANGING. PHASE IV. Harry S. Woods and George W. Forgey, Illinois State University, Normal, Illinois.

GREAT THINGS ARE HAPPENING, STUDENT HANDBOOK, COLLEGE OF AGRICULTURE. Southern Illinois University at Carbondale, Carbondale, Illinois.

SOUTHERN ILLINOIS UNIVERSITY REGISTRAR'S REPORT. Fall 1988, SIUC, Carbondale, Illinois 62901. (Specifically for reference of Grade Point average by student classification and by student's academic unit.)