

# ***Pakistan Institutional Excellence Project***

(Cooperative Agreement No. Pakistan 391-0498-A-00-0802-00)

## **Cooperating Institutions:**

- University Grants Commission,  
Islamic Republic of Pakistan
- U. S. Agency for International Development
- Midwest Universities Consortium  
for International Activities, Inc. (MUCIA)

# **PRELIMINARY INSTITUTIONAL ANALYSES REPORT**

**JUNE 4 - 13, 1990**



**Lead University:**  
Purdue University  
West Lafayette, IN

## PROJECT PURPOSE

The purpose of the Institutional Excellence Project (IEP) is to improve Pakistan's capabilities to develop, adapt, and utilize advanced scientific and technology innovations in support of economic and social development. This purpose will be achieved by strengthening research, teaching and outreach in selected science and technology departments in cooperating universities. The primary mechanisms to be employed in this effort will be the establishment of formal and informal linkages among Pakistani and U.S. scientists and their institutions, education and training and a small grants research program.

### For additional information contact:

#### *In the U.S.:*

Purdue University  
Purdue Project Management Office  
1528 AGAD Building Room 3  
West Lafayette, IN 47907-1528  
Tel: 317-494-9626  
Fax: 317-494-4584

Midwest Universities Consortium for  
International Activities, Inc.  
Office of the Executive Director  
66 East 15th Avenue  
Columbus, OH 43201  
Tel: 614-291-9646  
Fax: 614-291-9717

#### *In Pakistan:*

Islamabad Project Management Office  
University Grants Commission  
H-9  
Islamabad, Pakistan  
Tel: 92-51-856690

Human Resources Development  
USAID/Pakistan  
18 6th Avenue, Ramna-5  
P.O. Box 1028  
Islamabad, Pakistan  
Tel: 92-51-824071  
Fax: 92-51-824086

Chairman  
University Grants Commission  
H-9  
Islamabad, Pakistan  
Tel: 92-51-856072

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151 80375

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# **PAKISTAN INSTITUTIONAL EXCELLENCE PROJECT PRELIMINARY INSTITUTIONAL ANALYSES**

**June 4 - 13, 1990**

## **1. INTRODUCTION**

This document summarizes the preliminary institutional analyses conducted at four Pakistani universities identified for participation in the Institutional Excellence Project (IEP). It is divided into four parts. This introduction, (the first part) is followed by institutional analyses (part two) and general conclusions (part three). The final section (Part four) proposes the next steps in IEP's implementation.

The overall purpose of IEP is to improve Pakistan's capabilities to develop, adapt, utilize, and advance scientific and technology innovations in support of further development. This purpose will be achieved by supporting and strengthening research and teaching in a selected number of science and technology departments in phased activities over ten years. The primary mechanism for supporting this effort will consist of formal and informal linkages between selected Pakistani and U.S. university departments and a small grants program to support research.

IEP is being implemented through a cooperative agreement. Three parties have major roles to play in the agreement: The University Grants Commission (UGC) of the Islamic Republic of Pakistan, the United States Agency for International Development in Islamabad (USAID/Islamabad), and the Midwest Universities Consortium for International Activities (MUCIA). MUCIA, the implementing agency, is comprised of eight U.S. higher education institutions. These are Indiana University, University of Illinois, University of Iowa, Michigan State University, University of Minnesota, Ohio State University, Purdue University, and the University of Wisconsin. Five additional universities have joined MUCIA for IEP. These are the University of Arizona, Florida Agricultural and Mechanical University, Georgia Institute of Technology, Pennsylvania State University, and Washington State University. Purdue University is the lead institution for the project.

## **1.1 Purpose**

The Preliminary Institutional Analyses consist of plans to visit each of the proposed sites to determine the readiness of these university departments to participate in a comprehensive linkage program with a U.S. university(ies) department(s). Visits were made to the following sites.

- Department of Chemistry, Gomal University, D.I. Khan
- Center of Excellence in Mineralogy and Department of Geology, University of Balochistan, Quetta
- Department of Electrical Engineering, University of Engineering and Technology, Lahore

A travel restriction imposed by the U.S. Consulate in Karachi for safety reasons made it impossible for the team to travel to the University of Sind at Jamshoro to visit the Department of Geology. The Vice Chancellor and faculty travelled to Karachi to meet with the team at the Sheraton Hotel in Karachi.

## **1.2 Process**

One to two day visits were made to each institution by representatives of the UGC and MUCIA. Team members are listed in Appendix A. The visits consisted of meetings, interviews, facilities tours, and informal discussion. Key individuals consulted are listed by institution in Appendix B.

In the very limited time allowed for each visit, the team considered disciplinary specialities for strengthening; staff qualifications, interest, and commitment; quality and accessibility of facilities and equipment; and the degree of administrative commitment to IEP. Institutional representatives made presentations and provided additional materials. These, plus information already available to the team, served as the basis for questions and open discussion.

A primary concern was the adequacy and availability of technical and professional staff and their interest in participating in all aspects of this institutional strengthening program. Critical to this is an assessment of the institution's staff to determine if they understand the amount of effort that will be required for effective participation in IEP. This staff assessment will be very important for identifying sub-

areas recommended for strengthening. As important as the presence and quality of facilities (libraries, laboratories and equipment, for example) is the extent which they are available and the manner in which they are used. Finally, the team recognized that long-term progress will not be possible unless there is an institutional environment conducive to change.

The team wishes to acknowledge the willingness of staff at all the institutions who accommodated it very graciously on short notice and to express its gratitude for their hospitality. Each institution willingly provided information and tours and answered questions thoughtfully and patiently.

## 2. ANALYSIS AND RECOMMENDATIONS

This part of the document summarizes the outcomes of team site visits. It is organized by institution in the order in which they were visited. In each case a summary of the strengths is followed by issues/concerns that emerged during the visit. An assessment of the strengths in relation to the issues/concerns guided the team's recommendation.

### 2.1 Department of Chemistry, Gomal University

The team visited Gomal University on June 6-7, hosted by the UGC and the Vice Chancellor of the University. Because there is close cooperation between chemistry and pharmacy and agriculture, and because MUCIA/IEP faculty have worked there (David Smith from Purdue University and Howard Miles from the University of Central Florida) the team also visited the Department of Pharmacy and the Faculty of Agriculture.

The following *strengths* contribute to the readiness of the Department of Chemistry of Gomal University to participate in IEP:

- Administrative support of all levels;
- Faculty commitment throughout institution;
- Well-trained and qualified staff;
- Excellent linkages to the Department of Pharmacy (sharing facilities, advising, etc.) and the Faculty of Agriculture;

- Young faculty involved in the review;
- Enthusiastic faculty with a cooperative spirit within and between chemistry and pharmacy;
- Five female faculty included in the review.

The team identified the following *issues/constraints* which need to be considered in this preliminary analysis and in any future work at Gomal University:

- Need to focus at sub-speciality area;
- Need to identify development-related problem areas;
- Faculty needs to understand IEP as a program and not as a limited set of activities;
- Facilities and equipment are limited and need upgrading (air conditioning, dust proofing, cold room, etc.);
- Library needs upgrading and is only open limited hours;
- Computer facilities inadequate and may be inaccessible;
- Student/faculty ratio is too low;
- Department may have too many specialized interests for the number of students;
- Electrical supply not adequate for sophisticated scientific equipment;
- D.I. Khan is remote; this constrains communications, acquisition chemicals, etc.

The team is of the opinion that IEP should begin to work with the Department of Chemistry at Gomal University.

The Chemistry Department at Gomal University has an energetic and eager faculty. It is the team's opinion that, at this time, IEP focus should be on chemistry and not on the Department of Pharmacy as well. It is suggested that when IEP begins strengthening activities in the discipline of pharmacy that Gomal University be considered at that time. The Pharmacy Department will gain as a result of IEP commitment to chemistry because of the existing close cooperation between the two departments.

Gains to the Pharmacy Department can be enhanced to the extent that the problem areas selected by chemistry overlap with research interests of the pharmacy

faculty. An example is research on the medicinal properties of local plants for the development of local drug industry.

Strengthening activities in the Department of Chemistry will give IEP an excellent opportunity to develop what has been an under-utilized resource to date. It has four female faculty members and one female research associate. These individuals can and should be an integral part of IEP's strengthening activities. MUCIA recognizes that this may require special effort (for example in housing selection, if women were selected for further professional development) but is willing to commit energy and support so as not to lose this important human resource.

One issue that emerged from the Gomal University visit is that of efficiency. There are several areas of inefficiency. Examples include student/teacher ratios and library hours. Part of a plan to achieve excellence must be clear goals and strategies to use available resources as efficiently (this includes the concept of effectiveness) as possible. This is one area where administrative support for policy change will be as important as faculty commitment.

Special attention needs to be paid to concerns surrounding Gomal University's remoteness. It's location influences its ability to acquire chemicals and replacement parts. It may also be a serious factor in constraining or inhibiting linkages with the private sector.

## **2.2 Center of Excellence in Mineralogy, University of Balochistan, Quetta**

The team visited the University of Balochistan June 9-11, 1990. The visit was hosted by the Vice Chancellor and the University Grants Commission. Prior to the team's visit it had been agreed that the team would include the Department of Geology in its review. Dr. George McCormick, a member of the review team, received a particularly warm welcome as he had had two previous Fulbright Fellowships in the Center of Excellence in Mineralogy (1983-84 and 1988).

Analysis of "readiness" was complicated by the need to look at two similar and complementary units housed in the same building but with separate funding sources,

funding mechanism, facilities and equipment. The following *strengths* contribute to the readiness of the University of Balochistan to participate in IEP:

- The Vice Chancellor is supportive and forward-looking;
- He brings public/private sector linkages through his earlier work in the Ministry of Science and Technology;
- Selection of a new Dean of Science is in its final stages; all candidates are supportive of IEP;
- There is interest in IEP in both mineralogy and geology;
- Staff is adequate for strengthening under IEP if mineralogy and geology are considered together;
- The Center of Excellence in mineralogy has good facilities, equipment, and logistical support;
- There appears to be interest and willingness regarding cooperation between the two units at the highest administrative levels and among faculty and students;
- The Department of Geology has faculty with good academic backgrounds;
- Younger faculty and students were involved in the review;
- The two faculties have identified four general substantive areas, in which they share interests, and understand the importance of this focus;
- Facilities are good, in general;
- There is ample space for expansion;
- Equipment needs are modest.

The team noted the following *issues/concerns* for consideration:

- The Center of Excellence in Mineralogy does not have sufficient qualified personnel; the Department of Geology lacks resources (funding, equipment, facilities, etc.);
- Transportation is a serious constraint for field work in geology;
- There are no female faculty in either unit;
- Although there appears to be a spirit of cooperation between the two units it is not clear how well-entrenched it is;
- There is duplication of facilities and equipment between the two units;
- Library resources need strengthening;
- There are no computer facilities;
- A consistent and constant power supply is needed;
- Some facilities renovation is necessary (air conditioning, dust proofing, etc.).

The team recommends support to the University of Balochistan in the areas of mineralogy and geology with the caveat that the team responsible for preparing the Six-Year Development Plan is confident that appropriate progress can be made under IEP.

The differences between the Department and the Center are significant. They cannot be resolved by MUCIA. The solution must address financial as well as organizational issues.

No matter what solution is selected by the university, the UGC and the faculties, its implementation will take a skilled leader. The team did not have sufficient time during its site visit to address the leadership issue. By the time the assessment team visits the University of Balochistan, the principals will have had time to choose a solution to the situation.

In spite of the caveat noted above, the team felt that this could be an opportune time to forge linkages within the university and thus strengthen geology and mineralogy at this institution. There are four areas the two units have identified for support. These are sedimentology, micro-structures and tectonics; structural geology and tectonics; and petrology. The team felt that a decision to work in mineralogy alone could contribute further to divisiveness within the institution.

### **2.3 Department of Geology, University of Sind at Jamshoro**

A travel advisory issued by the U.S. Consulate in Karachi meant the team was unable to visit Jamshoro as planned on June 12. Although the decision not to travel was made at the last minute, faculty from Jamshoro came to Karachi to meet with the team.

The meeting was hosted by the Vice Chancellor. In addition to selected geology faculty, the Dean of Science and the Chairperson of the Department of Geography attended the meeting. The team was asked to consider support to geography as well as geology.

The following are *strengths* that contributed to the readiness of the University of Sind to participate in IEP.

- The Vice Chancellor is well-informed about and supportive of IEP;

- Three general areas of specialization have been identified--hydrogeology, petrology, and soft rock geology;
- There is faculty strength in both geology and geography;
- There is a sincere attitude of cooperation between the two departments;
- The faculty seem to understand the role of teaching in a premier graduate program;
- The Department of Geography has two female faculty members;
- The Department of Geology has demonstrated activity in addressing its transportation problems.

The following constraints were identified by the team:

- There is a serious shortage of equipment;
- The unit needs computer equipment even though the Department of Computer Science has a mainframe (IBM? Wang?);
- Library resources need strengthening;
- Facilities probably require upgrading;
- A consistent and constant power supply is needed.

The team is of the opinion that the Geology Department of the University of Sind at Jamshoro is ready to participate in IEP.

A major issue that needs to be resolved before a decision to accept this recommendation is taken relates to the political situation. This MUCIA assessment team felt very hampered because it was not able to see the institution it was assessing or to meet all the faculty (who had returned during vacation) gathered at Jamshoro to meet it. In this case "readiness" is less of an issue than whether MUCIA faculty can meet with colleagues when and where needed. Both USAID and the UGC must address the question of accessibility to Jamshoro.

The team believes a decision to include or exclude the Department of Geography should be internal to the university. Formation of a Department of Geosciences was proposed but it was also noted that this might exclude existing faculty in the Department of Geography who are social geographers.

#### **2.4 Department of Electrical Engineering, University of Engineering and Technology (UET), Lahore**

The team visited UET on June 13 and was hosted by the Vice Chancellor. The team visited with the Vice Chancellor, Dean, Director of Research and faculty members from the Department of Electrical Engineering. The chairman of the department was unable to return in time from Peshawar but did meet us later at lunch.

The team then toured the laboratories of the Department of Electrical Engineering. We were struck by two things: (1) the extreme lack of maintenance of the entire university and (2) the extremely outdated and limited laboratory equipment available. Students are, in part, being trained on equipment and technologies 50 years old (Tube power supplies, etc.).

The following *strengths* contribute to the readiness of the Department of Electrical Engineering at UET to participate in IEP.

- A strong and well trained faculty;
- The Vice Chancellor is interested in IEP and has participated in another institutional strengthening project with a U.S. university;
- There is potential for increased student enrollments at the masters and doctoral levels;
- Faculty have identified four areas for possible support under IEP--power engineering, electronics engineering, computer engineering, and communications engineering;
- Faculty understands the importance of focus, the need to set priorities, and the critical nature of a development orientation;
- The department understands the importance of and difficulties associated with links to the private sector.

The following *issues/concerns* need to be taken into account with regard to UET's participation in IEP.

- There appears to be ample space for teaching, research, and laboratory facilities;
- Computer facilities are inadequate;
- Library resources need strengthening;
- Equipment is outdated;
- There may be a need to clarify the role of "training" in IEP;
- The department's desire for a new building could delay or complicate IEP activities;

- Facilities maintenance is not adequate;
- The desire of UET to be "independent" could mitigate against the collaborative spirit that is essential for IEP success.

It is the team's opinion that the Department of Electrical Engineering at UET is ready to participate in IEP as long as its full cooperation with all parties involved in IEP is guaranteed.

The team responsible for preparing the Six-Year Development Plan should insure that agreed-upon strategies for and indicators of cooperation are included in the plan. It is only through joint decision-making and collegiality among scientists and administrators from all parts of the project that IEP can be a success.

The meeting at UET left the MUCIA team surprised and bewildered by the extraordinary emphasis on the level of financial commitment IEP was willing to make to UET. There is no question that a decision to work with UET will demand significant investments in equipment. This will be only part of the IEP "package," however. The plan development team may also wish to consider including strategies to encourage investment of income generated through the use of university facilities and equipment in a departmental or university development fund. At the present time the department is producing income from testing for the private sector. However, part of the income is used as a salary supplement for those who do the work and the rest goes to the general fund of the university. No income is reserved for machine time or a fund for repair, replacement, and purchase of new equipment.

### **3. GENERAL CONCLUSIONS**

- 3.1** Each unit needs to have a better understanding of IEP than they now have. They must be helped to realize that it is an integrated package of training, equipment, networking, and research focused on one or more sub-specialities.
- 3.2** Each unit must be made to focus on a few sub-specialities for the purpose of IEP. They must come to understand the importance of sub-specialities in focusing a long-term plan.

- 3.3** Some units are accepted conditionally for IEP in this initial assessment. Some of these units may have to meet specific conditions before participating fully in the program.
- 3.4** Most units must become far more efficient. For example, library, laboratory, and computer hours must be extended beyond the normal 2:00 p.m. closing time of many units and student/teacher ratios must be increased.
- 3.5** Issues related to financing of higher education at the national and institutional levels must be addressed. This is not only the funding of research but also the sustainability of (1) any activities supported by IEP and (2) quality higher education in general.
- 3.6** IEP is primarily concerned with the strengthening of the abilities and research productivity of younger faculty and female faculty. It must at the same time encourage senior faculty to take regular short courses and also become involved in IEP research programs in their units. Both aspects need to be well understood by all involved in IEP.

#### **4. NEXT STEPS**

- 4.1** The Subject Area Facilitator, in consultation with others (academic director, project officer, and representatives from UGC and USAID) assemble an assessment team for each unit consisting of at least the following:
- IEP academic director
  - UGC representative
  - Unit department or center chairman
  - Faculty member from unit other than chairman
  - Pakistan subject area specialist from another institution
  - USAID representative
  - MUCIA subject area facilitator (team leader)
  - Up to two MUCIA scientists representing discipline sub-areas

- 4.2** Set dates for assessment team to visit units in Pakistan and prepare a preliminary detailed six year institutional development plan for each unit. A draft preliminary plan must be written at the site visit and a final preliminary plan filed with the project academic director before the subject area facilitator returns to the U.S.
- 4.3** The assessment team for each unit will:
- Meet at Pakistani institution and discuss the "preliminary institutional analysis" report.
  - Determine what subject areas and sub-specialities should be chosen for strengthening.
  - Determine priority needs and decide which ones should be selected for strengthening activities.
  - Decide on mix of training, research, and networking activities that will result in project outputs.
  - Recommend and prioritize research equipment and computer needs with respect to the subject areas to be strengthened.
  - Develop plan that details activities in relation to expected outputs, complete with specified timeline and progress indicators.
- 4.4** Circulate the draft plan to academic unit, USAID, UGC for comments and suggested modification.
- 4.5** Identify possible U.S. departments for linkages and begin communications with (them) via electronic mail.
- 4.6** One or two Pakistani faculty members from each unit *may* visit possible U.S. linkage and other relevant institutions to meet faculty, review activities and facilities and equipment and gather additional input to draft plan. The visiting Pakistani faculty would first visit the MUCIA project office at Purdue University and then be accompanied by the subject area facilitator to other sites of interest.
- 4.7** Pakistani faculty return to Pakistan and draft plan is finalized and submitted to IEP's academic director with copy to project officer. Final input to the plan

from assessment team members, participating institutions and the subject area facilitators would be by electronic mail.

- 4.8** The six year institutional development plan will be finalized by the UGC and MUCIA and submitted to USAID for approval.
- 4.9** Faculty selected for Ph.D. training will submit biodata, GRE and TOEFL scores. If they have not taken the TOEFL they will be assigned an exam time. If unable to pass the TOEFL, they will be placed in an English language program.
- 4.10** Subject area facilitators and the Purdue project office will arrange for placement in the fall 1991 term for those faculty members who have completed documentation.
- 4.11** Training (Ph.D. programs) of faculty will begin in the U.S.

## APPENDIX A

### TEAM MEMBERS FOR THE PRELIMINARY INSTITUTIONAL ANALYSES

#### **USAID/Islamabad**

*Dr. David Sprague*

Chief

Human Resources Development Office

#### **Universities Grants Commission (UGC)**

*Dr. A. Q. Ansari*

Chairman of UGC

*Dr. M. H. Qazi*

Special Advisor of UGC

#### **Midwest Universities Consortium for International Activities, Inc (MUCIA)**

*Dr. Mary Pigozzi*

Associate Director of MUCIA

1215 Seventeenth Street, N.W.

Washington, D.C. 20036

*Dr. George McCormick*

Academic Director of IEP in Islamabad

Professor of Geology

University of Iowa

Iowa City, IA

*Dr. Charles Rhykerd*

IEP Project Officer

1528 International Programs

AGAD Building, Room 3

Purdue University

West Lafayette, IN 47907-1528

**ANNEX B**  
**KEY INDIVIDUALS CONSULTED**

**Gomal University**

The following administrators were extremely generous with their time and information. Discussions and tours of facilities also involved numerous faculty members in the Departments of Chemistry and Pharmacy, including five female faculty members in the Department of Chemistry.

<i>Nawabzada Saleem Dil Khan</i>	Vice Chancellor
<i>Prof. Dr. G. A. Miana</i>	Former Vice Chancellor and now Professor of Chemistry
<i>Prof. Dr. Abdur Rauf</i>	Chairman, Department of Chemistry
<i>Prof. Dr. M. I. Khattak</i>	Dean/Chairman, Faculty of Pharmacy
<i>Prof. Dr. Hamid Ullah Khan</i>	Dean, Faculty of Agriculture

**University of Balochistan**

<i>Dr. Shaukat H. Baloch</i>	Vice Chancellor
<i>Dr. Abdul Haque</i>	Director, Center of Excellence in Mineralogy
<i>Dr. Akhtar Mohammad Kassi</i>	Chairman, Department of Geology
<i>Dr. Mohammad Niamatullah</i>	Former Chairman of Department of Geology and now Associate Professor

**University of Sind**

The team was unable to travel to the University of Sind in Jamshoro due to a travel advisory issued by the U.S. Consulate in Karachi. Therefore, the following

administrators and faculty members from Jamshoro (except for Dr. N.M. Shaikh) came to Karachi to meet with the team.

<i>Dr. Rashid A. Shah</i>	Vice Chancellor
<i>Dr. Khurshid M. Khan</i>	Dean, Faculty of Natural Sciences
<i>Dr. N. M. Shaikh</i>	Director, UGC Regional Office, Karachi
<i>Dr. Lal Bakhsh Bozdar</i>	Chairman, Department of Geology
<i>Dr. M. Rias Ahmed</i>	Professor of Geology
<i>Dr. Allah Dino Memon</i>	Professor of Geology
<i>Dr. Ahmed Ali Memon</i>	Associate Professor of Geology
<i>Dr. M. A. Kazi</i>	Associate Professor of Geology
<i>Dr. Zafar Hassan Sayyad</i>	Professor of Geology

#### **University of Engineering and Technology, Lahore**

<i>Prof. Dr. Ikram Ul Haq Dar</i>	Vice Chancellor
<i>Prof. Dr. Syed Nazir Ahmad</i>	Director of Research
<i>Prof. Dr. Shah Mobinul Haque</i>	Dean, Faculty of Electrical Engineering
<i>Prof. Dr. K. E. Durrani</i>	Chairman, Department of Electrical Engineering
<i>Prof. Dr. Tabrez A. Shami</i>	Director, High Voltage Laboratory, Department of Electrical Engineering
<i>Prof. Dr. M. Ashraf Chughtli</i>	Professor of Computer Engineering, Department of Electrical Engineering
<i>Prof. Dr. A. Hameed</i>	Professor of Electrical Power Engineering
<i>Prof. Dr. A. R. Bukhari</i>	Professor of Biomedical Electronics