

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT
DEPARTMENT OF STATE
WASHINGTON, D.C. 20523

PROJECT PAPER
PAKISTAN - INSTITUTIONAL EXCELLENCE
391-0498

APRIL 1989

UNCLASSIFIED

PROJECT AUTHORIZATION

PAKISTAN

Institutional Excellence
Project No. 391-0498

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended (the Act), I hereby authorize Phase I of the Institutional Excellence Project for the Islamic Republic of Pakistan (Cooperating Country) involving planned obligations of not to exceed Thirty Million, Five Hundred Thousand United States Dollars (\$30,500,000) in grant funds over a seven (7) year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project. The planned life of Phase I of the project is seven years from the date of initial obligation. Subject to the availability of funds and contingent upon a favorable assessment of Phase I activities, Phase II of the project will be separately authorized and is estimated not to exceed Forty-nine Million, Five Hundred Thousand United States Dollars (\$49,500,000) in grant funds. Implementation is expected to commence in FY 1992 following the substantive evaluation. It is anticipated that the life of project for both Phase I and Phase II will be ten years from the date of initial obligation of Phase I.

2. The Institutional Excellence Project consists of assistance to departments of universities to improve and expand their teaching and research capability in areas of science and technology critical for national development. This will be accomplished through the establishment of linkages between Pakistani and U.S. universities based on faculty exchange, joint research and participant training. The project financing shall include, but not be limited to, the following: technical assistance to establish and support linkages, sub-grant research programs, workshops/seminars, commodity procurement and training.

3. The Project Agreement(s) which may be negotiated and executed by the officer(s) to whom such authority is delegated with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Project shall have their source and origin in the United States (A.I.D. Code 000) or Pakistan as their place of nationality, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the United States (A.I.D. Code 000) or Pakistan as their place of

nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

b. Conditions Precedent

1. Disbursement for Construction Activities

Prior to each disbursement under the Grant for construction or renovation, or to the issuance by A.I.D. of documentation pursuant to which such disbursement shall be made, the Cooperating Country will, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., final plans and specifications including cost estimates for such construction and renovation.

2. Disbursement for the Small Grants Component

Prior to any disbursement for the Small Grants Component, or to the issuance of any commitment under the Project Agreement(s) related to the Small Grants Component, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D., evidence of a system for establishing and staffing Technical Committees and an Advisory Board to review and approve recommendations for recipient of the small grants.

c. Covenants

The Cooperating Country shall covenant that, except as A.I.D. may otherwise agree in writing:

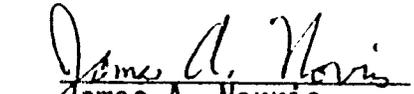
(1) It will make available qualified candidates for long and short-term academic training in the U.S. on a timely basis, and it will take all the appropriate steps to ensure that such candidates are assigned upon their return to suitable positions within the Centers of Excellence, Centers of Advanced Studies, or appropriate university departments.

(2) It will develop, approve and implement a plan which outlines the steps required to make higher education more financially self-sustaining.

(3) It will participate, along with A.I.D., in the evaluations, assessment and monitoring of all project funded activities.

(4) It will maintain a regular schedule of operation for project assisted institutions throughout the school year, despite any university-wide disturbances.

Approved Disapproved


James A. Norris
Mission Director
USAID/Pakistan

April 14, 1989
Date

Clearance:
RLA:TCarter 
HRD:DSprague (draft)
PDM:RNachtrieb (draft)
PDM:LMailoux (draft)
PRO:PDavis (draft)
FM:DPratt (draft)
DD:PGuedet JIG

PROJECT DATA SHEET

A - New
C - Change
D - Delete

2. COUNTRY/ENTITY
Islamic Republic of Pakistan

3. PROJECT NUMBER
391-0498

4. BUREAU/OFFICE
Asia and Near East [04]

5. PROJECT TITLE (maximum 60 characters)
Institutional Excellence Project Phase I

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)
Phase I
MM DD YY
05 30 96

7. ESTIMATED DATE OF OBLIGATION
(Under "B." below, enter 1, 2, 3, or 4)
A. Initial FY [89] B. Quarter [4] C. Final FY [96]

8. COSTS (\$000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	3,500	1,500	5,000	22,875	7,625	30,500
(Grant)	(3,500)	(1,500)	(5,000)	(22,875)	(7,625)	(30,500)
(Loan)	()	()	()	()	()	()
Other U.S. 1						
Other U.S. 2						
Host Country						
Other Donor(s)						
TOTALS						

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ESF	683	690				30,500		30,500	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)
639 660

11. SECONDARY PURPOSE CODE
661

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
A. Code RDEV BR BU
B. Amount 8,000 5,000 5,000

13. PROJECT PURPOSE (maximum 480 characters)
To assist select departments of universities and institutions to improve and expand their teaching and research capability in areas of science and technology critical for national development.

14. SCHEDULED EVALUATIONS Phase I
Interim MM YY MM YY Final MM YY
08 91

15. SOURCE/ORIGIN OF GOODS AND SERVICES
 000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)

17. APPROVED BY
Signature: James A. Norris
Title: Director, USAID/Pakistan
Date Signed: MM DD YY 01/14/89

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM DD YY

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List of Abbreviations and Acronyms

AID	Agency for International Development
ADP	Annual Development Plan
BTU	British Thermal Unit
CBD	Congress Business Daily
CDSS	Country Development Strategy Statement
CDWP	Central Development Working Party
COAS	Center of Advance Studies
COE	Center of Excellence
ESF	Economic Support Fund
FAA	Foreign Assistance Act
FSN	Foreign Service National
GDP	Gross Domestic Product
GNP	Gross National Product
HEJ	Hussein Ebrahim Jamal
HBCU	Historically Black Colleges and Universities
IEP	Institutional Excellence Project
LOC-TFCS	Letters of Credit - Treasury Financial Communication System
MOE	Ministry of Education
NWFP	Northwest Frontier Province
OPEC	Organization of Petroleum Exporting Countries
PACD	Project Assistance Completion Date
PC-I	Planning Commission Form 1 (GOP Project Approval Document)
PCSIR	Pakistan Council for Scientific and Industrial Research
PID	Project Identification Document
PSC	Personal Service Contract
PSA	Procurement Services Agent
RFA	Request for Application
SG	Small Grant
UGC	University Grants Commission
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	U.S. Agency for International Development

I. SUMMARY

- | | |
|--|----------------------------------|
| A. Cooperating Country | The Islamic Republic of Pakistan |
| B. Implementing Agency | Pakistan's Ministry of Education |
| C. Proposed Amount of Project | AID Grant \$80,000,000 |
| Phase I | \$30,500,000 |
| Phase II | \$49,500,000 |
| D. Project Assistance
Completion Date | May 30, 1999 |
| E. <u>Goal of Project</u> | |

To enhance Pakistan's capability to develop, adapt, utilize, and advance scientific and technological innovations for development purposes.

F. Purpose of Project

To assist selected departments of universities and institutions to improve and expand their teaching and research capability in areas of science and technology critical for national development.

G. Description of Project

The Institutional Excellence Project (IEP) will be a two phased activity implemented over a total of ten years. Phase I of the project is estimated to cost \$30.5 million, Phase II of IEP is estimated to require \$49.5 million and will commence implementation in FY 1992 following a substantive evaluation and assessment of Phase I activities. The total estimated costs of both phases of the project is \$80 million. The project is structured in two components, the Institutional Development Component and the Small Grants Component. Seventy-five percent of project resources will be directed towards Institutional Development and the remaining 25 percent toward the Small Grants Component.

1. Institutional Development Component

A total of nine institutions, Centers of Excellence (COE), Centers of Advanced Studies (COAS) or university departments, will receive funding under this component throughout the ten year life of project. The selected institutions all have applied programs in science and technology that are relevant to the development goals of Pakistan. They offer graduate degrees and undertake research, particularly in development related activities. Assistance to these nine institutions will focus on strengthening the institutions so they will be able to sustain improved functions at project completion. Each institution will develop a formal linkage with one or more comparable departments in U.S. universities.

(ii)

For implementation purposes these nine institutions will be divided into sets of three, with the first set being upgraded in Phase I. The second and third sets of institutions will comprise Phase II of the project.

Implementation for each of the three sets of institutions will be a two part activity. Shortly after the Cooperative Agreement is signed, a detailed six year Institutional Development Plan for the first three institutions will be designed. Specific details for sets two and three will be developed during Phase II prior to actual implementation. The Plans will identify two or three major national development problems that will form the focus of the institute's teaching and research program and the resources and activities necessary to implement the resultant Plan. The Plans will also describe the linkages to be established between the Pakistan entities and the appropriate U.S. university departments. Part two will entail the implementation of the Institutional Development Plan for each center or department and will cover a six year period.

The exact size of the project components may be revised as a result of the collaboratively developed Institutional Plans. However, for purposes of identification of the general scope and magnitude of the inputs, it is expected that both phases the Institutional Development Component will finance an estimated \$5.94 million for training, \$7.22 million for technical assistance (faculty exchange), \$5.56 million for research, \$2.87 million for seminars, workshops and conferences, \$6.36 million for commodities and \$1.57 million for construction (renovation of existing laboratories). Phase I will finance approximately \$1.93 million for training, \$2.82 million for technical assistance, \$2.16 million for research, \$1.00 million for seminars/workshops, \$2.30 million for commodities and \$0.60 million for construction. Phase II is expected to finance \$4.01 million for training, \$4.39 million for technical assistance, \$3.39 million for research, \$1.87 million for seminars/workshops, \$4.06 million for commodities and \$0.97 million for construction.

2. Small Grants Component

The primary intent of the Small Grants Component is to support research studies in science and technology. Other key activities viewed as important to the effectiveness of the Pakistan entity will also be considered. The Small Grants Component is not limited to university departments, COE and COAS. Laboratories, research centers and private industries will be eligible for support. IEP will look to these entities to develop coherent proposals detailing the precise nature of the request, the manner in which research will be undertaken, administrative and logistical arrangements for linkages, and justification for the grant. The project's cooperator* may provide assistance if needed for the final refinement of these proposals. The awards of the Small Grants Component will be made in three scientific disciplines per annum.

* Recipient of the Cooperative Agreement

Proposals will be evaluated by a committee of appropriate scientists from the public and private sectors under the direction of the University Grants Commission (UGC) in collaboration with Ministry of Education (MOE) and the Ministry of Science and Technology (MOST).

This Component will help adapt existing technology to, or evolve new scientific approaches for, development problems in Pakistan. Project funded assistance will focus primarily on specific development oriented research and, secondarily, on the upgrading of the institution. The Small Grants Component for both phases of the project will fund an estimated \$2.47 million for short-term technical assistance (faculty exchange), \$1.94 million of training, \$2.47 million for research, \$1.09 million for workshops and seminars, \$2.11 million for commodities and \$0.55 million for renovation of existing laboratories. Phase I will fund approximately \$0.91 million for technical assistance, \$0.88 million for training, \$1.23 million for research, \$0.48 million for workshops/seminars, \$0.71 million for commodities and \$0.18 million for construction. Phase II is expected to finance \$1.55 million for technical assistance, \$1.05 million for training, \$1.23 million for research, \$0.61 million for workshops/seminars, \$1.40 million for commodities, and \$0.36 million for construction.

To provide continuity between the design and implementation stages, a U.S. educational institution(s) will be responsible for both the Institutional Development component and the Small Grants component. A Cooperative Agreement will be awarded which will require the recipient to design and implement the Institutional Development Plans for three Pakistani academic institutes and implement approximately one-third of the Small Grants component. With the necessary approvals, the Cooperative Agreement may have a duration of ten years. Administrative costs for both phases of the project are at approximately \$10 million. Phase I costs are estimated at approximately \$4.80 million; Phase II are estimated at \$5.34 million.

II. PROJECT BACKGROUND

A. Higher Education in Pakistan: A Background Note

In 1947, the Muslims of the subcontinent achieved their long desired goal of a separate, independent Islamic nation. Yet as the bonds with India were severed, the newly independent Pakistan was confronted with the awesome task of nation-building. Nowhere was this more acute than in its education sector. Pakistan was left with only one of the 21 universities that existed in British India. Enrollment was not more than several hundred, including a few dozen women. According to the first census taken in 1951, Pakistan's total population was 33 million, of which only 16 percent were literate. Today there are over 100 million Pakistanis, yet literacy has barely reached 24 percent.

Pakistani institutions of education expanded rapidly on all levels after 1947. As a response to the social pressures of nation building, the number of public universities also proliferated. By 1970 there were seven universities with an enrollment of 15,000. In 1986 there were 21 universities enrolling over 150,000 students. While expansion has occurred, the overall participation rate in university education remains not more than 1.7 percent.

Given Pakistan's educational base at Independence, it would be difficult to refute arguments in favor of expansion. Nevertheless, concern has been expressed since the early 1950s, about the necessity of using resources efficiently to maintain reasonable educational standards. To ensure quality of higher education in science and technology, the GOP began to designate Centers of Excellence and Centers of Advanced Studies within specific universities during the 1960s. These centers (Table I) emerged in response to Pakistan's financial inability to equip all science departments in every university with modern instruments, and the newly independent country's manpower limitations to staff all university departments with qualified scientists. Concentration of resources to produce quality education was the main objective behind the creation of these centers.

TABLE I

Centers of Excellence:

University	Location	Field of Concentration
Baluchistan	Quetta	Minerology
Eng. & Tech.	Lahore	Water Resources Mgmt.
Quaid-i-Azam	Islamabad	Psychology
Karachi	Karachi	Marine Biology
Peshawar	Peshawar	Geology
Peshawar	Peshawar	Physical Chemistry
Punjab	Lahore	Solid State Physics
Sind	Jamshoro	Analytical Chemistry
Punjab	Lahore	Advanced Molecular Biology

Centers of Advanced Studies:

University	Location	Field of Concentration
Karachi	Karachi	Applied Economics
Karachi	Karachi	Chemistry
Karachi	Karachi	Business Administration
NWFP U of Ag.	Peshawar	Development Studies
Peshawar	Peshawar	Applied Economics
Quaid-i-Azam	Islamabad	Plasma Physics

In addition to establishing COE and COAS, the GOP during the Fifth (1977-82) and Sixth Development Plan (1983-88) attempted to focus exclusively on the consolidation and improvement of quality throughout the university sector. Unfortunately, physical expansion and quantitative growth consistently claimed a larger share of resources. Political policies, including nationalization and centralization, further eroded the quality of higher education. No limits were placed on teacher-student ratio and entry into prestigious institutions, previously based on merit, became routine. Even in COE and COAS, designated to be the elite academic institutions, quality remained elusive and the development of critical Ph.D. programs did not occur.

Today 62 percent of university enrollment is at the undergraduate level, with graduate (MA/MSc) and post graduate (M.Phil, Ph.D.) enrollments reaching 30 percent and 1.2 percent respectively. Professional universities have different enrollment ratios. Specifically, in the agricultural universities 24 percent of enrollment is at the graduate level and 14 percent at post graduate; in engineering universities, three percent is graduate and and there is no enrollment at post graduate level. Graduate studies in pure and applied sciences attract 30 percent of students. Female students account for 25 percent of enrollment at the graduate level and represent 15 percent of the total university population. University teacher-student ratios vary widely, from a low of 1:6 to a high of 1:25.

Despite the weakness of the education system, Pakistani universities still manage to educate students. Annual overall growth of enrollment in university education over the period of 1983-86 has averaged 6.7 percent with enrollment of professional students growing at 10.3 percent annually. During the same period, the average annual growth in graduate and post graduate enrollment has been around 9.4 percent, which indicates a growing student interest at these levels. In spite of the handicaps experienced by the COE and COAS, they remain Pakistan's elite academic institutions.

As Pakistan confronts its massive development issues, it needs to depend on the graduate level institutions to carry out development oriented research in science and technology. The country requires qualified scientists, engineers, managers, and other professionals to help design and implement development programs. Although large amounts of foreign aid are being channelled to the education sector, the universities have received limited attention from the donor community (See Section V, Development Activities of Other Donors).

As the United States enters a major new multi-year commitment of assistance to Pakistan, it is thus imperative to identify and strengthen a number of graduate level departments in science and technology on which Pakistan can rely for ideas, innovations, and the preparation of its future scientific leaders and managers in both private and public spheres of life.

III. PROJECT RATIONALE

A. Perceived Problems

1. Status of Education in Pakistan

Throughout Pakistan's history, the education sector has been seriously underfunded and relegated to a low priority. Pakistan has only recently begun to allocate as much as two percent of its Gross National Product (GNP) to the education sector; it has not accorded it as much as eight percent of total public expenditures. The country's literacy and primary school enrollment rates (24 percent and 50 percent respectively) are among the lowest in the world. Rural-urban and male-female imbalances are striking. Female literacy in rural areas averages only six percent. Gross Participation Rates for primary school children in 1985 ranged between 91 percent for urban boys and 27 percent for rural girls. These disparities increase for secondary education. Furthermore, only 16 percent of secondary aged children were enrolled in schools in 1986 and barely one percent of the population obtained a university degree during that year.

Qualitatively, educational services are inadequate by any reasonable standard. Curricula, instruction and facilities are poor. High teacher absenteeism, irregular pupil attendance, unsafe and insanitary buildings contribute further to the substandard levels of the schools. The education of rural females in particular continues to suffer because parents often find both actual and opportunity costs too high, or schooling conditions unacceptable, to enroll their daughters.

More importantly, little progress has been made in this sector in the last 15 years as the education system has not kept pace with the rapidly expanding school age population. The unusually low educational attainments of Pakistan's rapidly growing population, will be a serious impediment to the country's long-term economic development and will prevent a more equitable distribution of benefits from economic growth.

In Pakistan today, the most egregious failure in education remains at the primary level. Considering the current levels of education, and a population growth rate (over three percent) which will add more than a million children to the 6-12 age category between 1988 and 2000, the problems are staggering. A radically improved primary education system is fundamental to the achievement of national economic and social goals. In recognition of this, USAID has carried out a primary education sector assessment and is presently designing a \$280 million Primary Education Project. The proposed project intends to fund construction of schools, training, technical assistance and will provide financial incentives for policy changes, development of instructional materials and improvements of teaching training, administration and management.

Meanwhile, the pressure of problems in higher education threatens to dilute beyond repair the standards of universities and research centers. As Pakistan thus endeavors to deal with its massive primary education problems, it remains precariously dependent on the best qualified of its universities to carry out research for continuing development and to produce qualified scientists, engineers and civil servants, the leaders of tomorrow.

2. Higher Education

Higher education in Pakistan covers a wide spectrum of institutions in the public and private sectors. (Annex I details the structure of the education sector.) When compared to primary and secondary education, higher education has received relatively larger allocations of funds during most of the Five Year Plan periods, ranging between 30 and 50 percent of total educational development expenditures. These large financial allocations are clearly a response to strong social and political pressures.

However, relatively generous financial allocations have not been matched by comparable improvements in quality. Specifically, it is estimated that 32 to 54 percent of university students pass public examinations. Only two to three percent of that group score higher than 75 percent on the exams. A mere 26 percent of the teachers have Ph.D. degrees. Not more than five percent of the faculty contribute to "reputed" journals. Income generated through consultancy and research is minimal. Present enrollment of students in Ph.D. programs is only 0.5 percent. Less than one percent of university budgets is directed towards research. Finally, there has been scathing criticisms by federal and provincial public services commissions on the knowledge and abilities possessed by university students who are candidates for public service jobs. In a 1986 report to the Senate, the Federal Public Service Commission complained that only one in forty candidates was "really good, bright and scholarly". Many academicians fear that by the end of the century, the nation may lack sufficiently trained scientists, technicians and managers to operate at even the present level.

3. Science and Technology

The gap between Pakistan and other developing countries in science and technology is widening instead of narrowing. The number of Ph.Ds in scientific fields produced in Pakistan per annum is approximately 20. This can be compared with an estimated 3,000 in neighboring India. Pakistan was ranked third in science and technology among seven major Islamic countries during 1971-76. In 1985 it was downgraded to the sixth position of that same group.

The country has approximately 1,900 scientists/engineers per million population as compared with 4,100 in Iran and 6,900 in Turkey. UNESCO recommends that an optimum 25,000 Pakistani scientists should be engaged in research and development (R&D) based on the country's population and per capita income. A mere 6,500 are involved in R&D. In 1985, there were only 64 R&D scientists per million in Pakistan, while there were 352 per million in Turkey, 957 in Korea and 4,750 in Japan. As a corollary, Pakistan's expenditures on R&D are approximately 0.2 percent of its GNP, while the average for developing countries is around half a percent.* Various U.N. forums have recommended at least one percent of the GNP of developing countries be directed towards scientific R&D.

A specific example of Pakistan's difficulties comes from the Center of Excellence in Solid State Physics, which was established in 1975, with a student body of five. In a period of 12 years, 50 M.Phil degrees have been awarded, but only one Ph.D. candidate has completed the requirements for the degree. The average dropout rate over the years is 68 percent. Today the staff has grown from five in 1975 to only 12 professors. It is questionable if this represents a critical mass required to conduct meaningful research and to make an impact on the improvement of science and technology in Pakistan.

Yet Pakistan cannot afford to ignore science and technology which has been linked directly to advances in development. Over the past thirty years, a variety of econometric studies has indicated that the rate of a country's economic growth is heavily dependent on the rate of scientific and technological change, and the investments in new industrial technology have high social rates of returns, estimated at 30 to 50 percent.

The experience of these decades shows that the transfer of available technology is a necessary, but insufficient condition for development. Progress in most sectors requires continuous advances in science and technology. Increasingly, successes are achieved by generating the specific technologies needed to overcome Third World problems or adapting foreign technologies to indigenous conditions.

In Pakistan, the most promising sectors for scientific and technological innovation are agriculture, energy, and industry. Agriculture provides employment for over half of the country's labor force and represents nearly a quarter of domestic economic production. Future increases in agricultural production must come from increasing the productivity of existing inputs (especially water) and, expanding the share of higher value crops. While the energy sector is central to expanding productivity in all economic sectors it is especially critical for developing the industrial and service sectors, which together account for

* Developed nations spend over two percent of their GNP on R&D.

over two thirds of GDP. The industrial sector offers another fertile area for employing scientific and technological innovation. A recent World Bank study indicates that Pakistan has a comparative advantage in the textile, chemical, and light engineering industries. While these Pakistani industries are sizable, there is ample room for increasing productivity and efficiency.

Higher education institutions in Pakistan are already introducing and supporting scientific and technological innovation in these sectors as is illustrated below.

In agriculture, biotechnology offers a fresh new potential to improve human and animal health and revolutionize crop productivity. This may be especially significant in crops that do not lend themselves well to improvement by traditional breeding techniques. Specifically, plant research at the Center of Excellence in Advanced Molecular Biology in Lahore has focused on a variety closely related to chick peas, an important pulse in the Pakistani diets. This newly developed plant is resistant to Ascochyta Blight, a major plant disease in Pakistan. Through genetic research, scientists are attempting to cross breed resistant plants with indigenous cultivars to achieve resistance not available through traditional plant technology. Biotechnology may also improve pest management by making available new pest control processes. Specifically, in Pakistan's agricultural research laboratories, research is ongoing in the use of pheromones (sex attractant hormones) which can help to significantly reduce the cost of pest control through environmentally sound means.

While work in science and technology is underway in some of Pakistan's better academic institutes, much more is needed. For example, Pakistan's energy sector, which is characterized by a persistent supply-demand gap, is incapable of providing the energy needed for development. Yet this sector absorbs a major portion of the government budget, thereby limiting funds for vital investments in the social sector. However, worldwide scientific advances are occurring in areas such as solid state physics that could help Pakistan overcome its energy deficit. Specifically, research on the applications of semi-conductor materials and components for power control applications can lead to increased efficiency of power consumers, such as refrigeration and water pumping operations.

Coal is one of Pakistan's most abundant thermal resources, with subterranean potential estimated in excess of five billion tons. However, Pakistan's coal is generally of high sulfur content and of low-heating value, approximately 5000 BTUs per pound (as opposed to higher-ranked coal about 10,000 BTU per pound). In order to burn this coal in an environmentally acceptable manner, existing technology, such as fluidized bed combustion, needs to be adapted to a Pakistan specific

context. Coal beneficiation, that is the methods utilized for cleaning coal before use, is dependent upon the adaptation of more advanced technologies to Pakistani conditions. Beneficiated coal could be used to formulate diesel engine fuel, gas turbine fuel and coal water slurry fuel. These fuels could help reduce consumption of petroleum-based equivalents. Coal gasification is another area of long-term potential application that is dependent upon appropriate research and technological advances.

While a relationship between technology and development has been demonstrated, some theories suggest that trends in economic development induce technological change--that technological change is often a response to rather than a cause of development. Even assuming technology exists to meet the needs induced by such trends, there would remain a major effort to adapt that technology to the specific local conditions and to disseminate the changing techniques to the users. In order for the innovations to be ready and available when conditions require their application, research institutions need to be created decades in advance, research and development programs implemented years in advance, and dissemination and diffusion processes set in place in advance. For timely, scientific technological innovation to be induced by economic trends, prior conditions must be created so that scientists and technologists can anticipate future needs, and benefit from preparing the technology to meet those future needs. Establishing those prior conditions in Pakistan will be a major objective of IEP.

4. Reform of Higher Education

The general deteriorating quality of university education and the specific deficiencies in the education standards of science point to the critical need for major reforms in the present system. Because teachers occupy such a pivotal position both in the creation and transmission of knowledge, teacher development and training in the fields of science and technology need to receive the utmost priority. Other avenues for quality improvement include curriculum reform, changes in teaching methods, an increase in research funding for science and technology and a review of the overall balance between teaching, research and extension activities.

There is a clear need to optimize the use of Pakistan's scarce resources, consolidate facilities and rationalize university programs. As discussed in Section II A, the university sector has not focused on quality and consolidation; rather physical expansion and quantitative growth have consistently claimed a larger share of limited resources. As illustrative, eight universities have student populations under 2,000, with recurrent unit costs as much as two to three times those of larger universities.

Allocations for research and consumable materials in the university budgets generally do not exceed 1 percent and 0.7 percent respectively. Pakistan's science and technology libraries are frequently stocked with old and unused books. Added to that, current teaching-learning processes do not encourage the use of libraries, thus rendering them an underutilized resource. Library budgets are grossly inadequate and few professional journals and magazines are available. The budget for library books is between Rs. 22 to Rs. 363* per university student. This translates to approximately two new books per student per annum.

Finally, at many universities, the state of repairs and maintenance of physical facilities leaves much to be desired. Often universities have inadequate physical facilities and science laboratories. Many universities also have unusable or out of date scientific equipment or lack essentials.

Despite the problems of overall system, some of Pakistan's university departments, Centers of Excellence and Centers of Advanced Studies provide a promising base needed to improve higher education. Examples of agricultural research in biotechnology were noted above. Another noteworthy exception to the state of educational decline is the Center of Excellence in Geology, University of Peshawar. From its inception in 1974, this center has undertaken major research in support of Pakistan's development. Surveys are ongoing in mineral deposits and sedimentology which have lead to the identification of hydrocarbon resources in northern Pakistan. The Center also maintains good working relations with various government, parastatal and private organizations involved in the exploration of natural resources. The Center has done mapping, petrological analysis and appraisals of mineral finds for international oil companies and is presently working with the Tribal Areas Development Corporation in an assessment of copper deposits in Shinkai. With the Geological Survey of Pakistan, the Center is preparing tectonic maps of Pakistan and is working on a joint project on the petrology and geochemistry of the Shakot-Qila ophiolite.

The Center of Excellence in Geology's international caliber is evidenced by a 14 year collaboration with Dartmouth College in which major research was undertaken in the fields of paleomagnetism, sedimentology, vertebrate paleontology and radiometric dating. A collaborative research project was also undertaken with Oregon State University to examine tectonics of Pakistan's Northern Areas. An ongoing project with the University of Utah involves collaborative research on rock magnetism and paleomagnetism, also in the Northern Areas. Other joint efforts have been established with Leicester University in the U.K., and MacQuarie University in Australia.

* Rs. 19.00 equals One U.S. dollar

While Centers of Excellence like that in Peshawar can offer powerful examples of quality in the midst of a weak education system, it should be stressed it is the exception rather than the rule. A recent Asian Development Bank study on Pakistan's education sector (1988) stated that in general, Centers of Excellence have not been able to produce high quality research and that the quality of instruction is also deteriorating. It argues for a comprehensive program for improvement of research and library facilities, for upgrading instruction, especially in the areas of science and technology, and for improving curricula, text books and laboratory equipment.

It is an assumption of IEP that the economic growth of Pakistan is linked to the quality of manpower produced by its educational institutions and that advances in science and the ability to utilize and/or adapt technological innovations are the basis on which the development of the country rests. Therefore, it will be an explicit objective of IEP to strengthen select university departments, COE and COAS in the disciplines of science and technology and to encourage them to improve their performance in the development, practical application, and dissemination of innovations. The project will also institutionalize excellence in scientific teaching and research in these academic centers.

B. Conformity with Recipient Country Strategy

Education in Pakistan is essentially a provincial responsibility, but general policy and overall guidelines including curricula are set by Federal Legislation. Financial targets for development are reflected in Federal and Provincial Five-Year plans and refined in the Annual Development Programs.

The need for a radical shift in priorities towards the social sectors is now well recognized in Pakistan. When martial law ended in December 1985, the Zia Government began to stress the critical need to increase funding for education, to reduce illiteracy and to improve science and technology research and education. Actual investment in education is now increasing -- from 1.56 percent of GNP in 1982-83 to 2.46 percent for the period 1986-87. The current Bhutto government and the Pakistan People's Party are committed to raising the education's share to 4.5 percent of GNP by 1993.

The GOP allocation for higher education has consistently remained at 10-11 percent of the development budget. During the Seventh Plan, there will be only slight increases in the overall budget allocations to higher education. However, the Plan also provides for selective upgrading higher centers of learning by supporting identified Centers of Excellence. The GOP has reemphasized in the Seventh Plan its intention to support universities and Centers of Excellence to develop innovative programs in science and technology which will contribute to Pakistan's development. The Plan also calls for financing reforms in tuition and

admission fees and provides a broadened framework for new private sector universities.

The GOP, through the Ministry of Science and Technology, is presently funding 400 scholarships per year (1986-1994) for advanced overseas training in science and technology. This program demonstrates the commitment on the part of the GOP to higher education, excellence, and improved opportunities for many deserving Pakistani men and women.

In addition, the newly elected Bhutto government issued a party manifesto in November of 1988 which accords high priority to education. The specific objectives are to ensure that every child receives at least ten years of formal education and that the academic standards of higher education are raised to international levels. Applied research at universities is also to receive attention. A national conference on education policy is scheduled for March during which specific details of the new policy will be developed.

Finally, the Bhutto government has decreed that science and technology will be given a paramount place in the development of the country and that scientific methods will be adopted in Pakistan's approach to development.

C. Relationship to AID Policy, Strategy and Other AID Projects

AID policy on education is detailed in the December 1982 policy paper, Basic Education and Technical Training and in Supplement A to Handbook I. "The development of human resources is vital to the growth of productivity and the efficient use of physical capital. While the accumulation of physical capital resources is essential to economic growth, it is the people who shape and energize a nation's development". Although AID places highest emphasis on primary school education, the Agency maintains a strong interest in higher education in developing countries. AID policy is to use development assistance to help higher education institutions strengthen and revitalize instructional programs and focus on research and community service activities supportive of the national development policies and priorities.

Additional policy directives that are relevant to IEP include AID policy on Institutional Development, March 1983. On the assumption that institutional deficiencies may well inhibit effectiveness of development initiatives, AID's efforts in this area are directed to providing individuals with opportunities to acquire skills, resources and services needed to overcome institutional weaknesses. The purpose of funding institutional development is to increase the likelihood that AID and host country resources will foster development that can be sustained after external assistance is withdrawn. AID's policy determination on Selected Aspects of Science and Technology specifically encourages the more effective orientation of university science and engineering programs to

development needs. It focuses on institutional development to promote national science and technology policies, priorities, and organizational responsibilities for implementing the results scientific innovations.

USAID's strategy, as stated in the FY 1989-93 Country Development Strategy Statement (CDSS), is to "bolster political stability and national integration through programs of economic and social development." Improved social sector performance can improve the quality of life for the poorest people of Pakistan. A specific objective of USAID's activities is to improve the quality of key institutions, including those in the education sector.

IEP will improve and strengthen selected academic and research institutions concerned with the economic and social development of Pakistan. The CDSS states that "institutions, identified as outstanding sources of higher education, training and research, will improve standards and serve as a demonstration for existing public colleges and universities and potential new private institutions." IEP will provide public recognition and support to such institutions for quality performance during this period of general educational decline. The strategy will demonstrate how academic excellence can be maintained while the society as a whole deals with the greater deficiencies of the primary system.

IEP relates to USAID's current and proposed projects by providing a mechanism to support educational institutions crucial to the development of high quality graduates in science and technology. IEP will also complement research in USAID's priority sectors of energy, agriculture, engineering and health. Annex 2 provides project specific detail. More importantly, IEP and the proposed Primary Education Project will, together, provide a balanced approach to the improvement of Pakistan's educational system.

IV. PROJECT DESCRIPTION

A. IEP Strategy

The IEP strategy is based on the premise that economic growth is linked to the quality of manpower produced by select Pakistani institutes of higher education and to advances in science and technology. This strategy explicitly recognizes the need to focus IEP efforts in areas which will have the greatest impact on Pakistan's economic development (See discussion in Section III) and, within these areas, to establish priorities for IEP interventions which use resources most efficiently and offer the highest probability of success.

Donor assistance for higher education is traditionally characterized by large technical assistance, commodity, and/or construction activities which deliver specified levels of inputs and are implemented through a

standard project management structure. In some cases, this approach has failed to place sufficient emphasis on the quality of education and research. Its cost effectiveness has been questioned as well as its ability to sustain the momentum and continue to improve standards generated by project activities. The design and implementation of IEP is based upon a somewhat different configuration. A central element of the IEP is to link select Pakistani university departments with corresponding U.S. academic departments. A U.S. university (universities) which has demonstrated excellence in those academic fields targeted by the project, will collaborate in both the design and implementation of activities required to successfully achieve project objectives. This approach is expected to (1) develop broad-based and more indepth, qualitative links between the participating institutions, (2) provide a model of internationally recognized scientific and technological professionalism which Pakistani universities can observe first hand and emulate as desired, and (3) develop the institutional foundation required for sustainability, without necessarily involving direct donor support after the project is completed.

Another element central to the IEP strategy is the close assessment and continuous monitoring of the new ground being covered by this somewhat innovative project approach. Every effort will be made to learn from, evaluate, and modify, where necessary, IEP activities so that the overall project purpose can be achieved. Towards this end, the IEP has a rolling design and implementation (See Section IV C.1) i.e. existing activities are reviewed, assessed, and perhaps revised before new activities are initiated. In addition a comprehensive management information system for monitoring the progress of project activities in achieving purpose level objectives will also be established (see Section IX).

B. Project Goal and Purpose

1. Goal

The overall program goal of IEP is to enhance Pakistan's capability to develop, adapt, utilize, and advance scientific and technological innovations for development purposes. Progress towards achieving this goal will be measured by (1) the effectiveness of Pakistani institutions of higher education encouraging and facilitating science and technology advances; (2) the degree to which science and technology research is focused on key developmental constraints; and, (3) the level of resources, both human and financial which are made available to pursue undertakings in science and technology.

2. Purpose

The purpose of the Institutional Excellence Project is to assist selected departments of universities and institutions to improve and expand their teaching and research capability in areas of science and technology

critical for national development. This purpose makes a significant contribution to the program goal.

At the end of the ten year proposed life of project, Centers of Excellence, Centers of Advanced Studies or university departments, participating in IEP will be:

Directing efforts and resources to overcoming specific developmental problems. This will be verified by monitoring the subject matter of graduate courses and research activities as well as the applications of that research.

Obtaining adequate resources from the GOP to maintain and improve the standards established for educational and research activities. This will be substantiated by tracking amounts of ADP and recurrent budget allocations, the levels of faculty training and the levels of faculty compensation.

Providing higher quality education for larger numbers of scientists and technicians. This will be confirmed by monitoring graduate student enrollments, Ph.D. completion rates, employment rates for graduates, and annual reports and evaluations that assess the quality of instruction in relevant institutions.

Participating in a greater variety and improved quality of research and publishing the results thereof. This will be certified by observing the numbers of research proposals, publications in reputed journals, applications of research and the evidence and effectiveness of policies that facilitate and promote faculty research.

Actively networking with U.S. and other international science and technology institutions to maintain quality teaching, and research standards. This will be determined by the number of exchanges of both faculty and students and the variety, quantity and quality of joint research activities.

3. Project Outputs

The following indicative outputs are anticipated from project activities. They will be revised on the basis of detailed surveys to be developed for Part I, the specific Institutional Development Plans.

Output 1 - Productive Relationship Between Pakistani and U.S. Institutions Established

Nine established long-term linkages and a number of short-term linkages between GOP academic institutions and U.S. universities.

A qualitative improvement in teaching and research and the state of scientific education in these nine Pakistani academic institutions.

A broadening of knowledge, experience and an expansion of a data base for the U.S. institutions on the basis of their Pakistan-specific experience.

Output 2 - Stronger Linkages Between Development Issues and University Training and Research

Approximately 224 workshops, conferences and seminars held on topics of science and technology related to Pakistan's major development problems.

Approximately 19 major research studies up to five years in length, or a larger number of short-term studies, in fields of science and technology on problems related to the development of Pakistan.

Output 3 - Students, Faculty, Scientist and Technicians Trained

Approximately 122 Pakistani graduate students trained to the M.S. and Ph.D. level in U.S. universities in the disciplines of science and technology become faculty in the Centers of Excellence, Centers of Advanced Studies or other university departments in disciplines of science and technology.

Approximately 459 students, faculty and researchers trained in short-term science and technology courses in U.S. and third countries.

Output 4 - Science and Technology Facilities Upgraded

Science and technology libraries upgraded in selected universities and English language capability strengthened as appropriate.

Computer rooms and laboratories renovated.

Appropriate scientific and technical equipment provided to selected institutions.

Output 5 - Administrative System for Encouraging, Reviewing, and Supporting S&T Research Established

A Committee and review criteria established for evaluating, awarding and financing local research proposals.

C. Project Structure and Components

IER will be a two phased activity implemented over a ten year period. The total estimated cost of the project is \$80 million with funds requested from FY 89 to FY 99. Phase I of the project is estimated to cost \$30.5 million. Phase II is expected to require \$49.5 million. The Institutional Excellence Project is structured in two parts: an Institutional Development (ID) Component and a Small Grants (SG)

Component. Seventy five percent of project resources will be provided for the Institutional Development Component and the remaining 25 percent for the Small Grants Component. Both components will be used to achieve common project objectives.

The Ministry of Education will be the principal recipient of IEP funds but it will collaborate with the Ministry of Science and Technology on substantive, technical matters. The MOE will be the conduit for funds which will flow from the UGC to the Centers of Excellence, Centers of Advanced Studies or university departments.

1. Institutional Development Component

The ID Component offers a model for a consolidated approach to higher education in Pakistan. It is designed to optimize scarce resources in the education sector through focusing on qualitative improvement in a select group of promising university departments. This component will strengthen select institutions which are presently unable to provide the quality and variety of education and research required to promote scientific and technological advances in vital economic sectors.

A total of nine institutions were selected by the GOP and USAID to receive funding under the ID component of IEP throughout the ten year life of project. These institutions were selected on the basis of a criteria which emphasize the efficient utilization of existing resources and offer a higher probability of success. The criteria required participating entities to have applied programs in science or technology that are relevant to the development goals of Pakistan. The entities were also required to offer graduate degrees, undertake research, particularly in development related activities, and demonstrate a desire to adopt those changes in structure, policies and procedures that will assist them in achieving excellence under IEP.

Assistance will strengthen these nine institutions so they will be able to sustain improved functions at project completion. Each institution will develop formal linkages with comparable scientific university departments in the United States.

The nine institutions selected for funding are: (a) Center of Excellence, Geology, University of Peshawar; (b) Center of Excellence, Advanced Molecular Biology, University of the Punjab; (c) Department of Electrical Engineering, University of Engineering and Technology, Lahore; (d) the Institute of National Capability, University of Karachi*; (e) Center of Excellence, Marine Biology, University of Karachi, Karachi; (f) the Center of Excellence, Solid State Physics, University of Punjab, Lahore;

* Previously called the Applied Economics Research Center (AERC)

(g) The Center of Advanced Studies, Applied Genetics and Saline Agriculture, University of Agriculture, Faisalabad; (h) the Department of Structural Engineering, University of Engineering and Technology, Lahore; and (i) Center of Excellence, Mineralogy, University of Baluchistan, Quetta.

For implementation purposes these nine institutions will be divided into sets of three, with the first set being upgraded during Phase I. Following a FY 1992 substantive evaluation and assessment of Phase I activities, Phase II of IEP will begin with the second set of institutions receiving assistance. The third set of institutions will receive funding in year four. The design of the ID Component recognizes that conditions may change in these targeted institutions during the life of the project and sufficient flexibility is required to permit substitutions of individual institutions (especially for sets two and three) based upon mutual GOP and USAID agreement.

Implementation for each of the three sets of institutions will be a two part process. Part one: Shortly after the project agreement is signed, a detailed, six year Institutional Development Plan for each of the initial three centers or departments, (CCE in Geology, COE in Advanced Molecular Biology and the Department of Electrical Engineering) will be developed. This Plan will identify two or three major national development problems that will form the focus of the institute's teaching and research program. A program of activities with corresponding levels of resources required to improve the quality of education and research associated with these development problems will be included in the Plan. The Plan will specify how appropriate U.S. university departments can be employed to assist the Pakistan entity achieve the results expected by the project purpose. The Plan will identify any existing linkages between participating departments and U.S. institutions and suggest ways in which they might be incorporated, if appropriate. Institutional Development Plans for the subsequent two sets of institutions will be developed during year three and year four respectively to ensure they are current and reflect the lessons learned with the first set.

Part two of IEP will implement the Institutional Development Plans for each center or department and will cover a six year period. Six years will provide sufficient length of time to lay the prerequisite foundations for project sustainability, particularly for participant training and research activities.

The exact size and type of project components may be revised as a result of the collaboratively developed Institutional Plan. However, for purposes of identification of the general scope and magnitude of the inputs, it is expected that the ID Component will finance training, technical assistance, research, seminars, workshops and conferences, commodities and construction.

Throughout the ten year life of project, approximately \$5.94 million will be provided for training, both long and short-term, in disciplines related to science and technology. This training can take place in the U.S. or Third Countries. Linkages will be established between U.S. and Pakistani universities which will provide an estimated \$7.22 million in short-term technical assistance to the Centers of Excellence, Centers of Advanced Research and university departments. This assistance will include U.S. faculty teaching courses and/or participating in joint research activities. It is anticipated that approximately \$5.56 million in funds will be required to support this joint research and the publication and dissemination of those efforts. While joint research between the linked universities will be a priority, research conducted solely by a Pakistani university will also be eligible for funding. Seminars, workshops, and conferences, critical prerequisites for establishing academic excellence, will also receive approximately \$2.87 million in project funds. An estimated \$6.36 million in project financed commodities will enable the centers and departments to obtain critical equipment needed to conduct quality research. It is anticipated that the commodities will include laboratory equipment, computers, library material, teaching and learning aids. Construction financed by IEP at an estimated \$1.57 million will be limited to the renovation of existing facilities in order to adequately house equipment. Laboratories will be upgraded to meet new requirements. Phase I will support an approximately \$1.93 million for training, \$2.82 million for technical assistance, \$2.16 million for research, \$1.00 million for seminars/workshops, \$2.30 million for commodities and \$0.60 million for construction. Phase II is expected to finance \$4.01 million for training, \$4.39 million for technical assistance, \$3.39 million for research, \$1.87 million for seminars/workshops, \$4.06 million for commodities and \$0.97 million for construction.

2. Small Grants (SG) Component

The primary intent of the Small Grants Component is to support research studies in science and technology. Other key activities that are viewed as important to the effectiveness of the Pakistani entity will also be considered. The Small Grants component is not limited to university departments, COE and COAS. Laboratories, research centers and private industries will be eligible for support. IEP will look to these entities to develop proposals detailing the precise nature of the request, the manner in which research will be undertaken, administrative and logistical arrangements for linkages, and justification for the grant. USAID's cooperator may provide assistance if needed for the final refinement of these proposals.

The Small Grants component will lend itself to additional joint U.S./Pakistani scientific cooperation. Specifically, the awards for the Small Grants component will be made in three scientific disciplines per annum. A joint U.S./Pakistani scientific committee will establish these disciplines and research priorities, therein. Proposals will be evaluated by a committee of appropriate American and Pakistani scientists from the public and private sectors under the direction of the UGC in

collaboration with the MOE and the Ministry of Science and Technology. The project cooperators will be responsible for identification of the American and Pakistani scientists.

The request for funds will relate to the adaptation of existing technology or the evolution of new knowledge which is of relevance to development issues in Pakistan. Project funded assistance will be focused primarily on a specific development oriented research and secondarily, on the upgrading of the institution. However, if it is opportune to generate a formal science and technology policy for Pakistan, the workshops/seminars under this component offer an international forum for the development of just such a policy. The Small Grants component will fund an estimated \$2.47 million in short-term technical assistance (faculty exchange), \$1.09 million for workshops and seminars and \$2.11 million for commodities, \$0.55 million for construction, \$2.47 for research, and \$1.94 short-term/long-term training throughout the ten year project. Phase I will finance approximately \$0.91 million for technical assistance, \$0.88 million for training, \$1.23 million for research, \$0.48 million for workshops/seminars, \$0.71 million for commodities and \$0.18 million for construction. Phase II is expected to finance \$1.55 million for technical assistance, \$1.05 million for training, \$1.23 million for research, \$0.61 million for workshops/seminars, \$1.40 million for commodities, and \$0.36 million for construction.

V. DEVELOPMENT ACTIVITIES OF OTHER DONORS

Recognizing that the economic growth and development of Pakistan is dependent on the quality of manpower produced by its educational institutions, the donor community in Pakistan has been making a concerted effort to finance programs that promote human resource development. In 1987 there were 47 projects that were approved and/or in the pipeline for funding in the education sector, with a total of external contributions of approximately \$468 million. Within this sector, 16 projects are specifically designed for higher education, which total an estimated \$43 million. Listed below are the major donors and a brief summary of their involvement in higher education. Project details are listed in Annex 3.

A. United Kingdom-Overseas Development Association

The British development program has focused on higher education through the provision of scientific equipment, teaching aids and books, through the establishment of linkages between Pakistani universities and universities in the U.K. and through the support of English language programs. The U.K. is providing an estimate \$15.3 million to fund these programs.

B. Japan

The Government of Japan is providing approximately \$21 million in scientific and research equipment to H.E.J*. Research Institute of Chemistry, the University of Engineering and Technology, and the Baluchistan Engineering College, Khuzdar.

C. Swedish International Development Agency

The Swedish Government is providing approximately \$77 thousand to Lahore Graduate School for Business Administration to fund faculty exchange and educational materials.

D. Netherlands

The Netherlands is funding scientific books and journals for Pakistani universities and research institutes through its provision of an estimated \$1.2 million.

E. OPEC Fund for International Development

Approximately \$5 million will be used by Pakistan from the OPEC Special Fund to establish and strengthen science educational schools and institutes.

F. United Nations

UNDP is providing approximately \$304 thousand to establish facilities for the maintenance and calibration of scientific, medical, industrial instruments and laboratory equipment at the Peshawar University of Engineering. UNESCO is interested in the possibility of establishing a post-graduate course in information studies through the Ministry of Science and Technology and plans a consultant mission to investigate this possibility.

* Hussein Ebrahim Jamal

VI. COST ESTIMATES AND METHOD OF FUNDINGS

A. Summary

The total AID contribution to the Institutional Excellence Project will be \$80 million in ESF grant funds of this amount \$30.5 million is budgeted for Phase I and \$49.5 for Phase II. It is expected that the GOP will contribute to the recurrent costs of the project supported units, including phased-in support for teaching assistance, duties on imported commodities and equipment, and other related operating expenses e.g. consumables. Table 1 summarizes the project budget by expense category. Table 2 presents the summary of costs by expense category and project components. Table 3 presents the summary of costs by expense categories and financial plan by fiscal years (excluding contingency and inflation).

Table 4 describes the method of implementation and financing of the project costs in accordance with the AID's Payment Verification Policy Implementation Guidance dated December 30, 1983. It is anticipated that costs incurred by the Cooperator under the Cooperative Agreement will be financed through Letters of Credit - Treasury Financial Communication System (LOC-TFCS). For procurement of commodities through a Procurement Services Agent, a Bank Letter of Commitment (Bank LCom) is considered appropriate and justified in view of multifarious procurement and proliferation of invoicing involved. Payments for the cooperator's logistics support, U.S. Personal Services Contractor and evaluation costs will be paid directly by USAID. Payment for construction/rehabilitation reimbursement is envisaged under a host country contract. Table 5 presents summary of expenditures of the project and the proposed obligation schedule.

The assumptions on which the financial tables are based include a five percent annual inflation compounded for foreign currency costs and 10 percent annual inflation for local currency costs. The contingency provision of 10 percent is factored into the total budget. The details of the budget by expense category are detailed in Appendix 5 of this Project Paper.

Table 1
Institutional Excellence Project
Budget Summary
(in US Dollars)

	Phase I	Phase II	Total
Faculty Exchanges	3,738,000	5,954,000	9,692,000
Training	2,820,000	5,064,000	7,884,000
short term	(1,470,000)	(3,120,000)	(4,590,000)
long term	(1,350,000)	(1,944,000)	(3,294,000)
Research	3,399,000	4,635,000	8,034,000
Workshops/Seminars	1,480,000	2,480,000	3,960,000
Commodities	3,020,000	5,460,000	8,480,000
Construction	793,250	1,336,000	2,129,250
sub total	15,250,250	24,929,000	40,179,250
Contractor cost	4,806,510	5,344,220	10,150,730
P.S. Contractor	1,266,600	512,200	1,778,800
Evaluation	515,600	228,240	743,840
sub total	6,588,710	6,084,660	12,673,370
Inflation	5,865,181	13,994,470	19,859,651
Contingency	2,786,916	4,500,813	7,287,729
Total	30,491,057	49,508,943	80,000,000

Table 2
Institutional Excellence Project
Budget Summary by Project Component
(in US Dollars)

Institutional Development Component	Phase I	Phase II	Total

Faculty Exchanges	2,826,000	4,396,000	7,222,000
Training	1,934,000	4,010,000	5,944,000
short term	(1,070,000)	(2,390,000)	(3,460,000)
long term	(864,000)	(1,620,000)	(2,484,000)
Research	2,163,000	3,399,000	5,562,000
Workshops/Seminars	1,000,000	1,870,000	2,870,000
Commodities	2,305,000	4,060,000	6,365,000
Construction	603,750	974,000	1,577,750
sub total	10,831,750	18,709,000	29,540,750
 Small Grants Component			

Faculty Exchanges	912,000	1,558,000	2,470,000
Training	886,000	1,054,000	1,940,000
short term	(400,000)	(730,000)	(1,130,000)
long term	(486,000)	(324,000)	(810,000)
Research	1,236,000	1,236,000	2,472,000
Workshops/Seminars	480,000	610,000	1,090,000
Commodities	715,000	1,400,000	2,115,000
Construction	189,500	362,000	551,500
sub total	4,418,500	6,220,000	10,638,500
 Contractor cost	4,806,510	5,344,220	10,150,730
P.S. Contractor	1,266,600	512,200	1,778,800
Evaluation	515,600	228,240	743,840
sub total	6,588,710	6,084,660	12,673,370
 Inflation	5,865,181	13,994,470	19,859,651
Contingency	2,786,916	4,500,813	7,287,729
 Total	30,491,057	49,508,943	80,000,000

Institutional Excellence Project (Phase I and II)
 Summary of costs by year of expenditure
 (\$ in 000s)

Table 3

Expense Category/FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
TECHNICAL ASSISTANCE	542	1,170	1,170	1,284	1,246	1,170	1,170	1,170	542	228	9,692
fx	434	936	936	1,027	997	936	936	936	434	182	7,754
lc	108	234	234	257	249	234	234	234	108	46	1,938
TRAINING	218	771	926	1,026	1,056	1,022	921	837	666	441	7,884
Long term	108	351	486	486	486	432	351	297	216	81	3,294
fx	12	312	432	432	432	384	312	264	192	72	2,844
lc	96	39	54	54	54	48	39	33	24	9	450
Short term	110	420	440	540	570	590	570	540	450	360	4,590
fx	77	294	308	378	399	413	399	378	315	252	3,213
lc	33	126	132	162	171	177	171	162	135	108	1,377
COMMODITIES	190	450	900	1,175	1,950	1,600	1,105	625	285	200	8,480
fx	190	450	900	1,175	1,950	1,600	1,105	625	285	200	8,480
lc	0	0	0	0	0	0	0	0	0	0	0
CONSTRUCTION	0	242	311	317	327	301	277	165	96	96	2,129
fx	0	242	311	317	327	301	277	165	96	96	2,129
lc	0	0	0	0	0	0	0	0	0	0	0
OTHER COSTS	293	888	1,460	2,178	2,291	2,218	1,357	852	709	491	12,738
Research Projects	103	412	1,030	1,545	1,751	1,442	927	412	309	103	8,034
fx	52	206	515	773	876	721	464	206	155	52	4,017
lc	52	206	515	773	876	721	464	206	155	52	4,017
WShops, Seminars etc	190	430	430	430	540	510	430	440	400	160	3,960
fx	114	344	344	344	432	408	344	352	320	128	3,130
lc	76	86	86	86	108	102	86	88	80	32	830
Evaluation	0	46	0	203	0	266	0	0	0	228	744
fx	0	38	0	172	0	229	0	0	0	195	633
lc	0	8	0	31	0	37	0	0	0	34	110
CONTRACTOR	978	1,306	1,189	1,435	1,265	949	1,079	770	635	544	10,151
fx	782	1,045	951	1,148	1,012	759	863	616	508	435	8,121
lc	196	261	238	287	253	190	216	154	127	109	2,030
FSC	242	135	135	242	135	135	242	135	242	135	1,779
fx	194	108	108	194	108	108	194	108	194	108	1,423
lc	48	27	27	48	27	27	48	27	48	27	356
TOTAL	2,463	4,963	6,090	7,657	8,270	7,395	6,150	4,554	3,175	2,135	52,853
fx	1,854	3,975	4,805	5,959	5,532	5,859	4,897	3,650	2,498	1,719	41,744
lc	609	987	1,286	1,698	1,738	1,536	1,258	904	677	416	11,109

Expense category	Method of Implementation	Method of financing	Approx. amount \$000s
A. Institutional Development			
Linkages: Visiting professors	Cooperative agreement (competitive contract)	LOC TFCS	7,000
Training	Participant training under non-profit contract/Cooperator	LOC TFCS	5,944
Research	Cooperative agreement	LOC TFCS	4,504
	faculty exchanges	LOC TFCS	270
	equip., commodities (shelf items)	LOC TFCS	788
	research assist., indirect costs	LOC TFCS	
Workshop and Seminars	Cooperative agreement	LOC TFCS	2,950
Commodities	Procurement Services Agent	Bank L Com	6,065
Const./rehabilitation	Competitive selection		
	HC competitive	HC Reimbursement	1,578
sub-total			29,621
B. Small Grants			
Linkages: Visiting professors	Cooperative agreement (competitive contract)	LOC TFCS	2,470
Training	Participant training under non-profit contract/Cooperator	LOC TFCS	1,940
Research	Cooperative agreement	LOC TFCS	2,002
	exchanges	LOC TFCS	120
	equip., commodities (shelf items)	LOC TFCS	350
	research assist., indirect costs	LOC TFCS	
Workshop and Seminars	Cooperative agreement	LOC TFCS	1,010
Commodities	Procurement Services Agent	Bank L Com	2,115
Const./rehabilitation	Competitive selection		
	HC competitive	HC Reimbursement	552
sub-total			10,559
C. Contractor			
	Cooperative agreement (competitive contract)	LOC TFCS	8,867
	Commodities (AID logistics support)	Direct Payment	90
	Computers, photocopiers, vehicles, typewriters etc.	LOC TFCS	86
	Maintenance, supplies etc.	LOC TFCS	570
	Local staff	LOC TFCS	
	Office rent, utilities	Direct Payment	405
sub-total			10,151
D. US PSC	Personal Services Contract	Direct Payment	1,779
E. Evaluation	AID Direct Contract	Direct Payment	744
Total			52,857

Table 5
 Institutional Excellence Project (Phase I and II)
 Summary of Expenditure and Obligation
 (US Dollars in thousands)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TOTAL		2,463	4,916	6,137	7,657	8,270	7,395	6,150	4,554	3,175	2,135
fx		1,854	3,937	4,843	5,959	6,532	5,859	4,893	3,650	2,498	1,719
lc		609	979	1,294	1,698	1,738	1,536	1,258	904	677	416
Inflation		154	609	1,192	2,072	2,866	3,178	3,185	2,664	2,245	1,698
TOTAL INCL. INFLATION		2,617	5,525	7,328	9,729	11,136	10,573	9,336	7,218	5,419	3,833
Cumulative expenditure		2,617	8,142	15,470	25,200	36,336	46,909	56,244	63,463	68,882	72,715
Planned Obligation	5,000	10,000	10,000	10,000	10,000	10,000	15,000	10,000			
Cumulative Obligation	5,000	15,000	25,000	35,000	45,000	55,000	70,000	80,000			

1. Technical Assistance (Faculty Exchange)

AID will provide a total of \$9,692,000 (for Phase I \$3,738,000 and for Phase II \$5,954,000) for technical assistance over the ten year life of IEP. This amount represents approximately 18 percent of the project budget and consists of costs which will support visiting U.S. professors. Out of the total budget for technical assistance of \$9,692,000, \$7,222,000 will go towards the Institutional Development (ID) Component and the balance \$2,470,000 to the Small Grants (SG) Component. Under the Institutional Development Component it is expected that the \$7,222,000 will support 69 visiting professors, with varying durations of stay in Pakistan from a maximum of nine months and a minimum of three months. Under the Small Grants Component, the \$2,470,000 will support 65 visiting professors from the U.S. with an average duration of two months. The amounts budgeted under technical assistance are exclusive of the professorial visits to the universities.

Phase I will provide \$ 2,826,000 under the I.D. component and \$912,000 under the SG component. This amount will support 27 and 24 visiting professors for the two components, respectively. The total provision under Phase I is \$3,738,000.

Phase II will provide \$5,954,000 for the faculty exchanges. The ID and SG components will receive \$4,396,000 and \$1,558,000, respectively. The number of exchanges financed will approximate 42 for the ID and 41 under the SG component.

2. Training

Long-term and short-term training will be financed to strengthen teaching and research units at the Centers of Excellence, Centers of Advanced Studies, and the chosen university departments. The training budget provides a total of \$7,884,000 out of which \$4,590,000 will support short-term training in the U.S. and Third Countries and \$3,294,000 will support long-term training in the U.S. The short-term training budget is divided between the Institutional Development and the Small Grants Components. Of the total budgeted for short-term training, \$3,460,000 is for the Institutional Development Component (346 trainees, with an average duration of 2 months) and \$1,130,000 for the Small Grants Component (113 trainees with an average duration of 2 months each). The budget of \$2,484,000 for the Institutional Development Component's long-term training is expected to support 92 trainees in the U.S. for an average duration of two years. The balance of \$810,000 for the Small Grants Component will support 30 trainees in the U.S. for the same duration.

Phase I provides a total of \$2,820,000 for short-term (\$1,470,000) and long-term (\$1,350,000) training. The amount for short-term training budgeted under ID component (\$1,070,000) and under the SG component (\$400,000) and is considered adequate to support 107 and 40 trainees, respectively.

Phase II will provide \$5,064,000 for long-term (\$1,944,000) and short-term (\$3,120,000) training. The amount for short-term training budgeted under the ID component is (\$2,390,000) and for the SG component is (\$730,000). This is sufficient to support 239 and 73 trainees, respectively.

3. U.S. Pakistan Joint Research

Funding for research will cover the usual costs associated with carrying out research, including personnel, field support, data gathering and processing, materials, supplies, transportation and dissemination of research findings. The total budgeted under this expense category is \$8,034,000 which is approximately 15 percent of the total budget; \$5,562,000 will go to the Institutional Development Component and the balance, \$2,472,000 to the Small Grants Component. The average duration of a research project under the Institutional Development Component is assumed to be approximately 5 years. Given this assumption the budget will support a maximum of 11 major research projects. Under the Small Grants Component \$2,472,000 will support eight research projects with an average duration of three years each*. The total research budget will support approximately 78 years of research.

Phase I provides \$3,399,000 for research undertakings; \$2,163,000 for the ID component and \$1,236,000 for the SG component. This amount will fund approximately 4 projects under each component.

Phase II provides \$3,399,000 and \$1,236,000 under the ID and SG components, respectively. The budget for research undertakings total \$4,635,000, and will fund approximately 7 projects under the ID component and 4 under the SG component.

4. Conferences, Workshops and Seminars

IEP will assist the centers and departments to sponsor conferences, seminars and workshop related to the development problems and to other areas of importance, such as the design of a science and technology policy for Pakistan. Approximately 7.5 percent of the budget is for this activity. The total amount available is \$2,870,000. Out of this \$2,870,000 will be in the Institutional Development Component and the balance \$1,090,000 in the Small Grants Component. The budget in the Institutional Development Component will support approximately 53 seminars in which several scientists are drawn from outside Pakistan and one major international conferences. Provision has also been made for 120 smaller workshops with a maximum participation from the domestic community, the cooperator and/or visiting professors. The workshops, conferences and seminar budget of \$1,090,000 under the Small Grants Component will provide funds for approximately 26 seminars

* It is more likely however that research under the I.D. and S.G. components will involve both major and minor scientific investigations of varying lengths of time.

with limited international attendance and 23 seminars workshops with predominantly domestic attendance. Provision is made under the Small Grants Component for one international conference.

An amount of \$1,480,000 is budgeted under Phase I of the project, \$1,000,000 under the ID and \$480,000 under the SG component. The funds will support 62 seminars/workshops under the ID component and 21 (including one international conference) under the SG component.

Phase II will provide \$2,480,000 for this expense category; \$1,870,000 and \$610,000 for ID and SG components, respectively. The funds will support 112 seminars/workshops (including one international conference) under the ID component and 29 under the SG component.

5. Commodities

The project will fund laboratory equipment, computers hardware and software, library materials (example journals, books, tapes,) and teaching/learning audiovisual equipment as appropriate. The total amount budgeted for commodities is \$8,480,000 or 16 percent of the project budget. Out of this, approximately 21 percent or \$6,365,000 is for Institutional Development and the 30 percent balance, that is \$2,115,000, is for Small Grants. The detailed list of commodities and appropriate specifications will be identified under the Institutional Development Plan. However, for illustrative purposes a list of commodities required by the Center of Excellence in Geology can be found in Annex 4.

Phase I budgets a total of \$3,020,000 for commodities; \$2,305,000 under the ID component and \$715,000 under the SG component.

Phase II provides \$4,060,000 and \$1,400,000 under the ID and SG components, respectively. The amount budgeted under the two component totals \$5,460,000.

6. Construction/Rehabilitation Costs

The project will fund the limited rehabilitation of laboratories and/or computer facilities. The total construction budget is \$2,129,250 or four percent of the project budget. Out of this, \$1,577,750 is budgeted for Institutional Development and will be sufficient to rehabilitate approximately 35 laboratories, 96 mini and 193 micro computer rooms. The construction budget for the Small Grants is \$551,500 and will be sufficient to rehabilitate 24 laboratories, 16 mini and 114 micro computer rooms.

The amount budgeted under Phase I totals \$793,250, of this \$603,750 is budgeted under the ID component and the balance \$189,500 under the SG component. The amount is considered adequate to rehabilitate 17 laboratories, 34 mini-computer rooms and 73 micro-computer rooms under the ID component and 10 laboratories, 5 mini-computer rooms and 34 micro-computer rooms under the SG component.

Phase II provides \$974,000 and \$362,000 under the ID and SG components respectively. The budget totals \$1,336,000, and is adequate to rehabilitate 18 laboratories, 62 mini-computer rooms and 120 micro-computer rooms under the ID component and 14 laboratories, 11 mini-computer rooms and 80 micro-computer rooms under the SG components.

7. Acquisition Costs

The amount budgeted for the Cooperative Agreement is \$10,150,730 (Phase I \$4,806,510 and Phase II 5,344,220), or approximately 19 percent of the total project budget. The details are found in Annex 5. The cooperator costs are based upon the assumption that a university or a consortium of universities would be responsible for a design and implementation of the IEP. The term of the Cooperative Agreement is assumed to be ten years.

8. Personnel Services Contractor

Provision has been made in the cost estimates for a US-PSC position located in the office of Human Resource Development (HRD). The term of the contract is projected at ten years and responsibilities could include coordination with the cooperator, COE, COAS or departments, and the University Grants Commission. Under Phase I \$1,266,600 is budgeted and under Phase II \$512,200. The amount for both phases totals \$1,778,800.

9. Evaluation

Provision has been made for four evaluations during the ten years life of the project. The total amount budgeted under this category is \$743,840 (under Phase I \$515,600 and Phase II \$228,240).

10. Inflation

Inflation provision is calculated for foreign currency costs at 5 percent compounded annually and local currency costs at ten percent compounded annually. Total of inflation is approximately \$20,000,000.

11. Contingency

A provision for ten percent of all costs constitute the contingency and totals approximately \$7,000,000.

VII. IMPLEMENTATION PLAN AND SCHEDULE

A. Implementation Plan

It is expected that IEP will be authorized in April and the Grant Agreement signed in May 1989. The GOP planning document, the PC-1 is expected to be approved by November 1989. The Implementation Schedule detailed in Section C is based on the assumption that this PC-1 will be general in nature, derived from projections found in this document. A

more protracted implementation would occur if the PC-1 was based on detailed information drawn from the specific Institutional Development Plans.

IEP will be a two phase activity implemented over a total of ten years. The two project components, Institutional Development and Small Grants, will have separate plans for implementation.

1. Institutional Development Component

USAID will enter a Cooperative Agreement mode of contracting based on the advantages it offers in coupling the design and implementation process. It is the intent of IEP to have the competitively selected U.S. university or group of universities provide specific plans for assistance for each of the nine centers. That same university or universities will then proceed to implement the program.

a. Part I activities will center on the development of a six-year Institutional Development Plan for each of the nine participating institutions. Initially detailed Plans will be developed for the first three selected institutions (January - April 1990) and will constitute Phase I of the project. Detailed Plans for the second and third set of Centers will be developed in September 1991 and November 1992, respectively following substantive evaluations. This will constitute Phase II of the project. The Plans will identify the two or three major national development problems that will form the focus of the institution's teaching and research program and the resources and activities necessary for its implementation. The Plans will be developed by the U.S. university cooperator in full collaboration with the participating Pakistani institution. Each Plan will take into consideration the needs and objectives of the participating institution as well as the capabilities and limitations of the U.S. institution. The resultant Plans will be presented to USAID and the MOE/UGC for approval.

b. Part II activities will include implementation, monitoring and evaluation of the resultant development Plans. Project's resources will be systematically introduced in accordance with the Plan developed by both the Pakistani and U.S. institutions. Implementation will extend for a six year period for each of the three sets of nine institutions.

To allow for effective monitoring and evaluation of project implementation, a gradual phasing in of the nine institutions is envisioned. The nine institutions have been subdivided into sets of three, with the first set being upgraded in the second project year, or Phase I. In Phase II, the second set will be upgraded as well as the third set. The institutions have been grouped as follows:

First Set (Phase I)

(a) COE in Geology, University of Peshawar, Peshawar; (b) COE in Advanced Molecular Biology, University of Punjab, Lahore; (c) Department of Electrical Engineering, University of Engineering and Technology, Lahore;

Second Set (Phase II)

(d) Institute of National Capability, University of Karachi, Karachi; (e) COE Marine Biology, University of Karachi, Karachi; (f) COE, Solid State Physics, University of Punjab, Lahore;

Third Set (Phase II)

(g) COAS, Applied Genetics and Saline Agriculture; University of Agriculture, Faisalabad; (h) Department of Structural Engineering, University of Engineering and Technology, Lahore; (i) COE Minerology, University of Baluchistan, Quetta.

2. Small Grants Component

Small Grants will be available to qualifying scientists located in laboratories, research centers and private industries as well as university departments not participating in the Institutional Development Component. While a wide range of project resources are also available under this component, the primary intent is to support research studies in science and technology.

The Small Grants component will lend itself to additional joint U.S/Pakistani scientific cooperation. Specifically, the awards for the Small Grants component will be made in three scientific disciplines per annum. A joint U.S/Pakistani scientific committee will establish these disciplines and research priorities, therein. Proposals will be evaluated by a committee of appropriate American and Pakistani scientists from the public and private sectors under the direction of the UGC in collaboration with the MOE and the Ministry of Science and Technology. The project cooperator will be responsible for identification of the American and Pakistani scientists.

Approximately one-third of the Small Grants component will be funded in Phase I; the remaining two-thirds in Phase II.

B. Procurement Plan

The procurement of services is discussed in Section X, the Acquisition Plan.

A specific list of commodities will be determined for each of the nine Centers during the design of the Institutional Development Plan. Commodity requirements for general Institutional Development and/or the research proposals, will be reviewed and approved by the MOE, UGC and USAID. Commodities will be procured according to AID regulations. To the extent possible, maintenance and service agreements will be included in the procurement. However, for illustrative purposes, a list of commodities that may be required at the Center of Excellence in Geology, University of Peshawar is provided in Annex 4.

C. Implementation Schedule

<u>Commence Action</u>	<u>Action</u>	<u>Responsible Party</u>	<u>Complete Action</u>
	IEP Submitted for USAID Review	USAID	Feb 28, 1989
Feb 15, 1989	RFA Developed	USAID	May 01, 1989
Apr 15, 1989	PP Authorized	USAID	Apr 15, 1989
Mar 31, 1989	Grant Agreement Signed	USAID/GOP	May 31, 1989
May 01, 1989	PC-1 written	GOP	Jul 01, 1989
	<u>Acquisition of PSC</u>		
	PIO/T fully-executed and submitted to Office of Commodities & Contracts (O/CC)*	USAID	May 31, 1989
Jun 01, 1989	CBD synopsis published	USAID/AID/W	Jun 15, 1989
Jun 15, 1989	Announcement Closing Date (applications received)	USAID/AID/W	Jul 31, 1989
Aug 01, 1989	Evaluation results submitted to O/CC	USAID/AID/W	Sep 01, 1989
Sep 01, 1989	Award Contract	USAID	Oct 01, 1989
Oct 01, 1989	PSC mobilized	USAID/PSC	Nov 01, 1989
Jul 01, 1989	PC-1 approved	GOP	Nov 01, 1989
	<u>Acquisition of Cooperative Agreement</u>		
	PIO/T fully-executed and submitted to O/CC	USAID	May 01, 1989
May 01, 1989	CBD synopsis published	USAID/AID/W	May 15, 1989
May 15, 1989	Solicitation (RFA) Document issued	USAID/AID/W	Jun 15, 1989

* The fully-executed PIO/T prepared by the Technical Office will have a project description and well-reasoned evaluation criteria. Drafts of the project description evaluation criteria may be submitted to O/CC for review prior to inclusion in the final PIO/T.

Jun 15, 1989	Solicitation Closing Date (applications received)	USAID/AID/W/ Applicants	Jul 31, 1989
Jul 31, 1989	Technical evaluation results submitted to O/CC	USAID/AID/W	Sep 15, 1989
Sep 15, 1989	Commence discussions* with the highest technically ranked institution	USAID/ Applicants	Oct 15, 1989
Oct 15, 1989	Award Cooperative Agreement**	USAID	Nov 15, 1989
Nov 15, 1989	Recipient mobilized	Contractor	Jan 15, 1990

PHASE I

Jan 31, 1990	Detailed Institutional Plans developed for 3 Centers	Contractor	Apr 31, 1990
Jul 31, 1990	Monitoring Plans developed	Contractor/ Centers	Aug 31, 1990
May 01, 1990	Implementation for First Set of Centers	Contractor/ Centers	May 01, 1996
Aug 01, 1991	Evaluation/Assessment	Consultant/ AID/W/GOP	Sep 01, 1991

PHASE II

Sep 01, 1991	Detailed Institutional Plans developed for Second Set of Centers	Contractor/ Centers	Dec 01, 1991
Dec 31, 1991	Implementation for Second Set of Centers	Contractor/ Centers	Dec 31, 1997
Oct 01, 1992	Evaluation/Assessment	Consultant/ AID/W/GOP	Nov 01, 1992
Nov 01, 1992	Detailed Institutional Plans developed for Third Set of Centers	Contractor/ Centers	Feb 01, 1993

* Discussions will focus on Cost Proposal and terms of the Cooperative Agreement.

** Prior to the award of the Cooperative Agreement a pre-award audit may be required. In this instance, it may be necessary to add 30 days to the acquisition schedule.

Feb 01, 1993	Implementation Begins for Third Set of Centers	Contractor/ Centers	Feb 01, 1999
Jan 1995	Mid-term Evaluation Corrections, Redesign As Required		Feb 1995
Jan 1999	Final Evaluation PACD		Mar 31, 1999 May 30, 1999

VIII. ADMINISTRATIVE ANALYSIS

A. Organizational Structure

Three federal ministries in the GOP are directly involved in the management of the country's educational system. These are the Ministry of Planning and Development, the Ministry of Finance and the Ministry of Education, which occupies the central role. Federal involvement in education consists of the general responsibilities for direction and development, planning and coordination, policy guidance and standards.

The Ministry of Planning and Development has an education unit which reviews all the educational development plans requiring federal funding. These plans are in practice contained in Annual Development Plans (ADPs) which are formulated during the year for implementation in the next fiscal year. Provincial ADPs are developed by respective planning and development units at the local levels and submitted to the Ministry of Planning and Development, through channels.

The Ministry of Finance is in charge of providing the funds for approved education projects with a federal aid component. The day-to-day affairs in federal-provincial relations concerning educational management are conducted by the Ministry of Education, which is the national overseer of the country's educational system. It is the main responsibility of the Ministry of Education to ensure that the national education policies, objectives and standards are observed and implemented by all concerned from the federal to the provincial and local levels of management.

1. Ministry of Education

The attached Figure A shows the organizational structure of the Ministry. It is headed by a Minister, who together with the Education Secretary, have the overall responsibility for providing general direction and policy guidance. The Ministry has nine wings: Administration, Planning and Development, Primary and Non-Formal Education, Higher Education, Federal Institutions, Sports and Welfare, Curriculum, Science and Technology and International Cooperation.

To the federal structure of the MOE should be added attached semi-autonomous bodies which have their own internal organization, usually headed by a Director General or Chairman, assisted by administrative and technical/professional staff. These bodies include the Literacy and Mass Education Commission, the Academy of Educational Planning and Management, Allama Iqbal Open University, Academy of Letters, National Institute of Psychology, University Grants Commission (UGC) and the National Education Council. The UGC is especially worth noting because of its involvement in higher education.

2. University Grants Commission

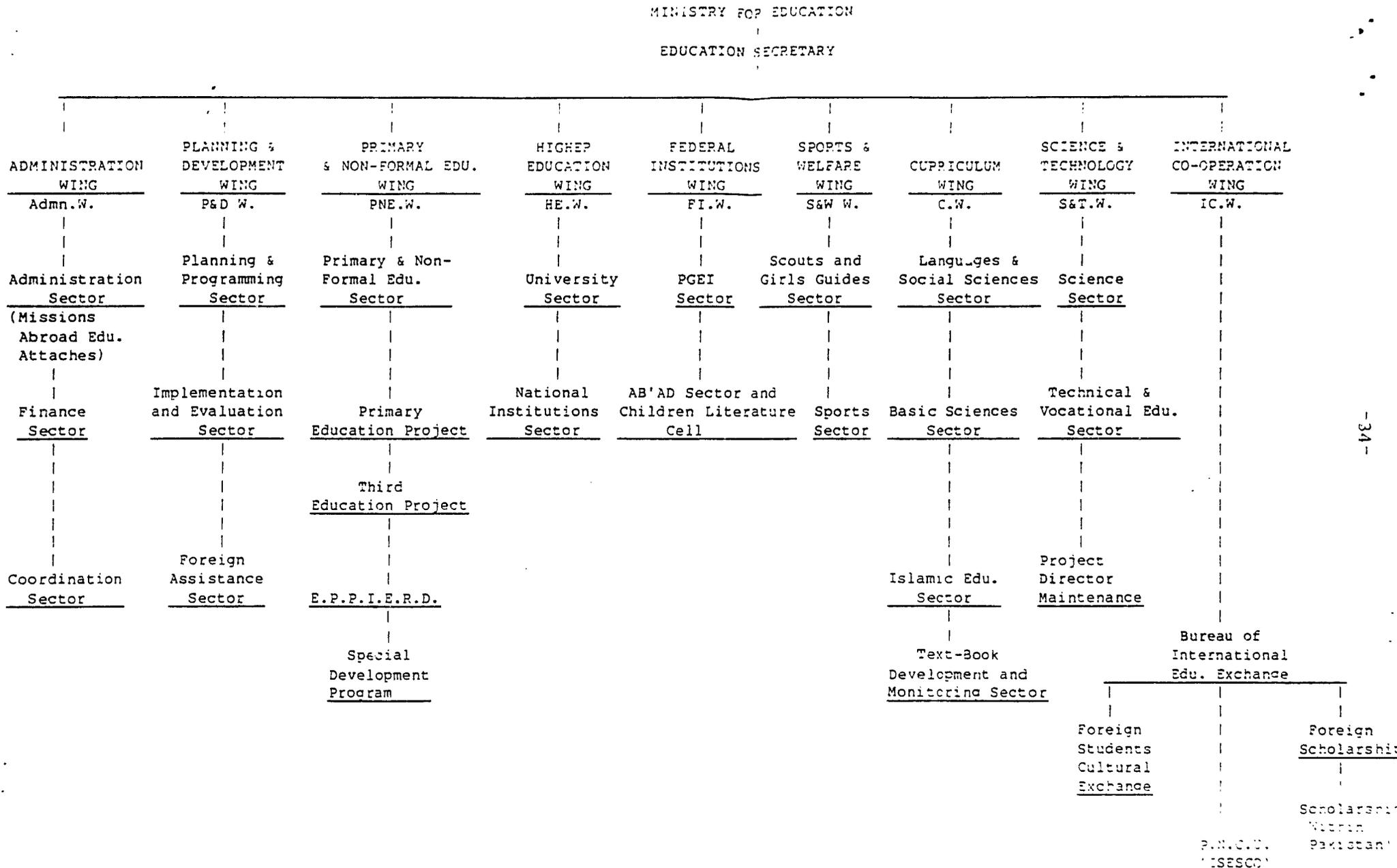
The University Grants Commission was established in 1973 under the federal Ministry of Education to promote and coordinate university education, to maintain standards of teaching, examination and research, to orient the university programs to meet national needs and to disburse funds to the public universities. The UGC is designed to guide and control university development by giving advice on the establishment of new institutions, departments and faculties, or the expansion of older ones, and has the power to inspect faculties and accounts and to withdraw funding. Curriculum for the universities is set by the UGC, with book selection and examination procedure left to the individual universities.

The membership of the Commission includes the chairman, two full-time members, two honorary members, the Secretary of the Ministry of Education, the chairman of the Vice-Chancellors Committee and the chairman of the Pakistan Science Foundation. The UGC has six directors or advisers covering planning, financial operation and administration functions. It has regional offices in Lahore, Karachi, Peshawar and Hyderabad. The main office is in Islamabad.

Every public university submits a budget request for recurrent and development costs in an annual cycle beginning in October. The UGC receives, reviews and integrates requests and submits a total university level budget to the Ministry of Education. The Ministry passes the total budget request to the Ministry of Finance, which presents the finalized budget, as part of the national budget request, to the National Assembly. UGC disburses the approved budget to the public universities in a fiscal year running from July 1 to June 30.

In addition to regular budget requests, special projects may be financed by preparing and submitting a special request form, the PC-1, to the UGC for GOP or foreign assistance. The UGC has authority to approve PC-1s up to 10 million rupees (approximately \$527,000). Requests over that amount and up to 30 million rupees (approximately \$1.57 million) are considered by the Central Development Working Party (CDWP), an inter-ministerial body. Requests exceeding 30 million rupees must be reviewed and approved by a Cabinet level Economic Coordinating Committee.

FIGURE A - ORGANIZATION CHART OF THE MINISTRY OF EDUCATION (SECRETARIAT) - 1986



3. Centers of Excellence and Advanced Research

To improve academic and research standards in certain fields and to produce higher level expertise for developing the country's resources, the GOP began in 1960 the process of designating Centers of Excellence and Centers of Advanced Studies within specific universities. Once designated, a Center draws up a development plan and submits it to the Ministry. These plans may include linkages with external agencies, e.g. U.S. universities and foundations. Admission to the Centers is based on merit according to a formula based on provincial populations.

The Centers of Excellence have their own Boards of Governors and a budget approval process that is separate from that of the rest of the university. The budget requests of the Centers go directly to the UGC. The Vice-Chancellor is the chairman of the Board of Governors of each Center and is also empowered to authorize financial disbursements. The Centers of Advanced Research also have their own Boards of Governors, but do not have separate budgets. Their budgets are considered within the overall budget of the university and must be approved by the university's budget review process before being submitted to the UGC.

At present, there are nine Centers of Excellence established in the following universities:

University	Location	Field of Concentration	# Enrolled*	
			M.Phil.	Ph.D.
Baluchistan	Quetta	Mineralogy	14	0
Eng. & Tech.	Lahore	Water Resources Management	46	2
Quaid-i-Azam	Islamabad	Psychology	9	3
Karachi	Karachi	Marine Biology	23	3
Peshawar	Peshawar	Geology	30	5
Peshawar	Peshawar	Physical Chemistry	10	4
Punjab	Lahore	Solid State Physics	20	0
Sind	Jamshoro	Analytical Chemistry	9	2
Punjab	Lahore	Advanced Molecular Biology	1	17

*1985-86

The Centers of Advanced Studies are:

University	Location	Field of Concentration
Karachi	Karachi	Applied Economics
Karachi	Karachi	Chemistry
Karachi	Karachi	Business Administration
NWFP U of Ag.	Peshawar	Development Studies
Peshawar	Peshawar	Applied Economics
Quaid-i-Azam	Islamabad	Plasma Physics

4. Parallel Organizations

In addition to the universities, there are other networks of parallel organizations which carry out training and research activities at the graduate level but are not within universities and do not offer degrees. These are also vital elements for national development needs; many receive donor assistance. Examples of this network include: Pakistan Institute of Development Economics, National Institutes of Public Administration, and the Pakistan Council of Scientific and Industrial Research (PCSIR) which has laboratories in Karachi, Peshawar, Lahore and Islamabad. These organizations have the same research objectives as Centers of Excellence and Advanced Research but they do not award degrees. The level of preparation of staff compares favorably to Centers, and the learning facilities (laboratories) are frequently better than those in the Centers. However, they also have difficulty maintaining standards of quality and focusing their resources on development issues and problems of national and provincial importance.

5. Cooperative Agreement

A cooperator will be responsible for working with the Pakistani institution for the design of a specific Institutional Plan and for the implementation of that Plan. This Cooperator will establish links between the selected Pakistani entities and U.S. universities, arrange short-term technical assistance, provide the required administrative support, and identify and monitor participants. The cooperator will implement the Small Grants Component (See Section X, Acquisition Plan). It is anticipated that the Cooperator will also be responsible for all procurement either through its own capacity or through the establishment of a contractual arrangement with a Procurement Services Agent (PSA).

Administrative arrangements of the cooperator are yet to be finalized. However, a Field Coordinator/Administrative Officer will be stationed in Pakistan. The Project's Academic Director may also be based in country. Alternatively he/she could be stationed in the U.S. yet make regularly scheduled trips to Pakistan. Finally, IEP will be supported by short-term technical assistance and a U.S. based organization.

6. USAID/Pakistan

The Office of Human Resource Development will be responsible for overall monitoring of the project and for coordination with GOP agencies and other entities in the implementation of this project. HRD is composed of three U.S. direct hires, and 14 Foreign Service Nationals. It is anticipated that a new PSC project officer will be assigned full time to IEP. This project officer will be physically situated in HRD but will liaise regularly with UGC and the cooperator. In addition, backstopping will be provided by a staff of two FSN professionals.

HRD in conjunction with the Office of Project Design and Monitoring will be responsible for coordinating a biannual Mission-wide review of the IEP with the intent of monitoring implementation and ensuring that the project is on schedule in accomplishing its objectives. Major contracting actions for IEP will be the responsibility of USAID's Office of Contracts. Project financial matters will rest with the Office of Financial Management. The Office of Engineering will be accountable for monitoring and certifying construction/renovation activities. Legal matters will be addressed by the Office of the Regional Legal Advisor and regularly scheduled evaluations will be organized by the Office of Program. These staff resources are considered adequate to handle USAID's monitoring and administrative responsibilities under this project.

B. Roles and Responsibilities

Daily operational and administrative actions for the project rest with the cooperator and the selected COE, COAS or university department. The rationale for this is the belief that institutional strengthening will occur more quickly and in a sustainable way if the center, institute or department has the responsibility for implementation.

MOE/UGC in collaboration with USAID's HRD will be responsible for the overall progress of the project and will ensure that IEP achieves its broad objectives. The main function of the UGC will be to coordinate the Small Grants' award process. In this respect, UGC will work in conjunction with MOST to identify members of, and schedule meetings for, the IEP Technical Committees. These committees will be formed to evaluate proposals, and recommend recipients of the Small Grants. The composition of the committees will include scientists from the relevant disciplines in both public and private sectors. The UGC will monitor progress reports of these Small Grants and will take appropriate actions to assist principal recipients in the effective utilization of project resources.

An Advisory Board will be established to review and approve the recommendations of the Technical Committees for the recipients of the Small Grants component. The Advisory Board will be composed of American and Pakistani scientists and representatives of the UGC, MOE, MOST, and USAID's HRD.

The UGC will also assist in the implementation of the Institutional Development component of the project. Specifically, it will review the Institutional Development Plan prepared at the outset by the center or department in conjunction with the cooperator. It will also be responsible for reviewing progress on an annual basis against the objectives of the Plan. Finally, the UGC will collaborate with USAID on any changes in the selection of the institutions to participate in this project.

The UGC staffing for the IEP has yet to be finalized. However, in addition to the project director, it is recommended that UGC have sufficient staff to direct and implement the Small Grants Component of the project and monitor on an annual basis the work of the selected centers. The project director should be an outstanding academic administrator, with considerable experience in research and in working with U.S. universities. He/she should have a reputation as an impartial judge of academic and scientific merit. It is recommended that the professional staff have expertise in the physical sciences or engineering as well as higher education management and administration. All should be familiar with administrative processes in MOE and UGC. Experience in working with U.S. universities is also highly desirable.

MOE and UGC have an effective working relationship. Since the resources of the IEP are targeted to centers, institutes and departments primarily within higher education, the focal point for project coordination is naturally the UGC. The basic policies and procedures needed for the administration of grants are already in place in MOE and UGC. Within higher education there is a mechanism for requesting research funds and institutional grants, including well established procedures and criteria. This mechanism works reasonably well, and is to the benefit of Centers of Excellence, which have special administrative and budgetary authority. There is an accepted peer review process in the UGC which is used for research budget requests. Similar processes exist in research agencies such as the Pakistan Council for Scientific and Industrial Research, Pakistan Science Foundation, Pakistan Council for Research in Water Resources, and Pakistan Agricultural Research Council.

IX. MONITORING PLAN

Project monitoring will involve constant knowledge and oversight of all IEP activities, quantitative and qualitative. To accomplish this, a Management Information System (MIS) will be established to track purpose achievement and relevant project trends towards that achievement. This will enable the Project Manager to make informed decisions and knowledgeably guide the project development. A secondary but equally important objective of the project's MIS will be to provide information to USAID which will help it assess the impact of IEP on its larger programmatic goals.

USAID is currently involved in the establishment of a Mission-wide Management Information System. Once the Institutional Development Plans for each of the first three centers have been developed, USAID and the cooperator will be in a position to design an appropriate project level information system. This information system is a critical component of IEP, for it will allow USAID and the GOP to learn from, assess and modify if necessary, IEP activities in the second and third set of project funded institutions.

Project monitoring will be the responsibility of the Project Officer, situated in the Office of Human Resource Development in conjunction with a Project Development Officer, located in the Office of Project Development and Monitoring. Both officers will work closely with other USAID support offices that have responsibilities related to project activities: the Office of Engineering on matters relating to construction, the Office of Contracts and Commodities on procurement operations and contracting procedures, the Office of Financial Management, on funding levels. The Project Officer will also liaise with the various technical offices on issues of mutual interest, i.e. research activities.

The following data bases are some examples of the information that could be incorporated into IEP's MIS which would provide data on IEP's progress and performance:

A. Administrative Data

Part of IEP's Management Information System could include the routine collection and analysis of existing administrative data. Specifically designed administrative records in terms of quarterly or semi-annual progress reports prepared by the cooperator could be a source of regular data for observing the progress of the project. Syllabi of classes, workshops and conferences, research publications, commodity tracking and training reports could be used as supplementary information. To be effective and useful, this administrative data must be focused: key indicators developed to meet strategic information needs. This administrative data could provide information on IEP's performance over time and allow the Project Officer to observe trends in project performance. Additional routine data, such as the increases in student enrollment, publications, will be available from the Centers of Excellence, Ministry of Education and Ministry of Science and Technology. This GOP data could also be incorporated into the administrative data component of a MIS.

B. Rapid, Low Cost Studies

Another possible component of IEP's MIS could be rapid, low cost studies. When confronted with unanticipated implementation problems or key management questions for which the Project Officer requires quick information feedback, then USAID/MOE/MOST could use such studies to provide the timely data for project decision-making. If required, these studies could be undertaken at regular intervals throughout the project life to provide managers with information on project trends. These types of studies are especially useful for shedding light on such issues as the relationship of project funded research to Pakistan's development priorities, progress towards academic and research excellence in the different Centers, questions of equity, appropriateness of the

commodities supplied, and effectiveness of training and short-term technical assistance.

C. Computerized Project Financial Data Reports

On a quarterly basis IEP financial data will be provided by the Office of Financial Management to the Project Officer on the amount of project funds obligated/earmarked, committed, disbursed, unliquidated obligations/markings, accrued expenditures and unexpended obligations/earmarking by individual project line items. This information could also be part of a MIS for the project.

D. Coordination

USAID places considerable importance on involving MOE, MOST, COE, COAS and university counterparts to the fullest extent in monitoring this project. From the above description of possible components of a MIS, the most appropriate areas for counterpart participation are in the development and implementation of administrative data systems and in the participation in the determination of the need for, and in the implementation of, rapid low cost studies. It is expected that a collaborative approach such as this will provide a common information base for both USAID and MOE/MOST project managers.

X. ACQUISITION PLAN

The technical services required to implement the two components of the IEP will be acquired as described below.

A. Institutional Development Component

1. Cooperative Agreement

IEP requires considerable innovation in both its design and implementation. The participating GOP institutions are required to develop new capabilities; devise new operating systems and policies relating research to national development issues; conduct new types of research; and at the same time upgrade faculty and staff through a major training program. There are no precedents for this type of activity at a similar level of magnitude in Pakistan. It is eminently clear that a sufficient timeframe is required to introduce such changes. For these reasons, it is difficult to define in advance, precise and objectively verifiable contractor inputs and long term project content as a basis for payment. This situation requires a flexible approach to project design contracting and project implementation. USAID believes that the professional collaboration of a U.S. higher education institution is required to achieve the project objectives. Since substantial USAID involvement is contemplated with the U.S. university, a Cooperative

Agreement is considered an appropriate instrument. (See Handbook 13, 6B2, and 6C).

There are two possible contracting approaches that USAID may employ. The first, and more likely approach, involves the award of a single Cooperative Agreement for a five year period, with two options for extension. These options will be exercised in FY 1992 and FY 1993 and will correspond to the design and implementation stage of the second and third set of institutions. Each option will extend the agreement by a specific period of time. An increased level of effort will also be incorporated with each option. With the necessary approvals, the Cooperative Agreement could have a duration of ten years.

The Cooperative Agreement will require the recipient to design, in conjunction with the Centers, detailed Institutional Development Plans for the first three institutions. The recipient will also be required to implement, in association with the Centers, the project for the first set of three Pakistani academic institutes over the six year implementation phase. The initial design stage will, however, be separated from the longer term implementation stage without any AID commitment to undertake the second until AID and the GOP have exercised their independent judgments on these Plans.

Options one and two will require the recipient to design in detail, and implement, the Institutional Development Plans in conjunction with the second and third set of institutions.

Prior to the implementation of these next two sets of academic institutions, time will be allotted to permit USAID and GOP assessment, as appropriate.

The second possible approach to acquisition could involve the award of up to three Cooperative Agreements. If, based on the above noted assessment, it is determined that USAID should not exercise an option, then another solicitation would be issued and a separate Cooperative Agreement awarded. The Agreement would correspond to the design and implementation of the next three sets of Pakistani academic institutions. Given this approach, it is possible that up to three different cooperators could be involved with the implementation of IEP.

AID Handbook 13, Chapter 6, governs the award of Cooperative Agreements. As set forth in Handbook 13, a Cooperative Agreement is in the nature of a gift in support of an agreed upon purpose. While the recipient is not under an enforceable "contractual" obligation to perform, it is nonetheless expected to use its best efforts to achieve the purposes of the cooperative agreement. With a Cooperative Agreement, USAID will maintain a "substantial involvement" with the recipient's work on the

project. This "substantial involvement" may take the form of USAID approvals of work plans and long or short-term personnel, field visits, reports, reviews, etc.

As stated previously, competition will be limited to U.S. educational institutions. Among the qualifying institutions, competition will be open.

To accomplish the task of selecting and awarding the Cooperative Agreement, a Request for Applications (RFA) will be issued to educational institutions which respond to a CBD notice. The RFA will require the applicants to set forth in detail their conceptual approach, methodology, procedures and technique for accomplishing the broadly stated set of objectives and work statements contained in the project descriptions. The potential cooperators will also be required to outline how they visualize the implementation of procurement and renovation activities of IEP.

The major implementation duties of the Cooperator include the (1) design and implementation of the Institution Development Plans for the academic institutes; (2) design and implementation of the Small Grants component; (3) establishment of productive linkages, or strengthening existing relationships, between the Pakistani institutes participating in the IEP and U.S. academic institutions including one-way faculty exchange (U.S. Professors to Pakistan) for teaching purposes; (4) the identification of participants for graduate programs; (5) coordination of the research component between U.S. and Pakistani scientists including a two-way faculty exchange; (6) logistical arrangement and design of substantive content for, and participation in, as appropriate, workshop, seminars and/or conferences as evolve from the design of the Institutional Development and Small Grants component; (7) providing technical advice and assistance to participating Pakistani institutes to upgrade science and technology facilities, including the development of technical specifications and procurement of appropriate equipment and the design of engineering plans for the renovation of existing laboratory facilities. Table 4, Section VI illustrates the flow of project funds in support of these activities.

It is envisioned that the Cooperative Agreement will require the services of a long-term field staff person, such as an Administrative Officer, as well as a long-term, Project Academic Director. In addition, numerous person-months of short-term technical assistance will be required under the Cooperative Agreement. While this staffing arrangement will be recommended in the project description of the RFA, USAID will reserve the right to evaluate alternative staffing modes as well as any changes to the work scope suggested by the applicants.

The Cooperator will be responsible for procurement of all project related commodities, either through its own capabilities or through establishing

a contractual relationship with a Procurement Services Agent. All procurement by a PSA will be in accordance with applicable AID rules and regulations.

The schedule for the acquisition of the Cooperative Agreement is located in Section VII C, Implementation Schedule.

Publication in the Commerce Business Daily, and the Request for Proposals will contain the following or similar language regarding the use of the Gray Amendment entities:

"AID encourages the participation to the maximum extent possible of Historically Black Colleges and Universities in this activity as recipients or sub-recipients in accordance with A.I.D. Handbook 13 and the Foreign Assistance Act. All selection evaluation criteria being found equal, the participation of such concerns may become a determining factor for selection."

Effective management of this project requires that all activities be under the control of a single recipient. While this effort is not considered appropriate for using set-asides in the selection of a recipient, the RFA will cite the potential for Gray Amendment entity (i.e. HBCU) involvement.

2. Personal Service Contracts

It is anticipated that a Personal Service Contract (PSC) will be awarded to obtain the necessary administrative and project management support. Since USAID requires an employee-employer relationship and will be in a supervisory role with an individual who will liaise with U.S and Pakistani technical experts working on the project, a PSC is the appropriate mechanism to establish such a relationship. Procurements of this nature will be performed under the Federal and AID Acquisition Regulations. This position will be long-term, with an expected three year duration. An option for extension of the PSC will be included. This position will be filled through normal AID competitive procurement procedures for PSCs. Thus, no waivers are expected to be sought. The schedule for the acquisition of a PSC who is retained from the United States is found in Section VII C, Implementation Schedule.

B. Small Grants Component

This component of the project will involve the award of small dollar (Rupee - equivalent) grants in response to proposals described in Section IV.C.2 of this project paper. These grants will be awarded by the University Grants Commission. Since these will be host country awards, the recipient of the Cooperative Agreement will assist the UGC in the formulation and oversight of the grant award procedures. This task

will also involve aiding the UGC in the development of technical evaluation criteria and selection procedures. USAID will maintain the right to approve the procedures for grantee selection as well as the final grant selections.

XI. SUMMARY OF ANALYSES

A. Technical Analysis

The technical analysis of the project focuses on the feasibility of defining and hence achieving excellence in higher education. The analysis notes that the evaluation of education involves both objective measurement and subjective judgment and suggests that although there is no universally accepted definition of excellence, there appears to be agreement on elements that contribute to the achievement of excellence. Specifically the analysis identifies the following contributory elements for the establishment of institutional excellence in higher education: well-trained and appropriately qualified faculty; well-equipped, maintained and staffed physical facilities; well-prepared and motivated students; and well-formulated and appropriate program and personnel policies that include an emphasis on quality research.

The technical analysis also outlines the criteria for approval of proposals from institutions (which include laboratories, research centers and private industries, as well as the centers of excellence which are the beneficiaries of the main project component) requesting resources under IEP's Small Grants Component.

B. Financial Analysis

The Financial Analysis illustrates that in the past education, science and technology have been accorded low GOP priority. Education has been allocated less than two percent of the GNP and under ten percent of the total government expenditure. Mitigating efforts are now apparent from allocations under the Seventh Five Year Plan which do reflect a shift in the emphasis in support of education, science and technology. However traditionally in the event of budgetary cuts the social sectors are among the first to be affected.

The total estimated expenditure under the Sixth Five Year Plan for the education sector was \$707 million, out of which \$73 million was directed towards universities. The Seventh Five Year Plan allocates \$1,194 million to the sector and \$95 million to universities. The education sector is heavily subsidized and cost recovered as tuition fee is negligible. The government is considering a move in which at least ten percent of the recurrent cost would be recovered through tuition fee and the balance through direct and indirect resource mobilization.

The estimated expenditure under the Sixth Five Year Plan for science and technology activities total approximately \$205 million. This was split among education and training, agriculture, industry and minerals and energy. The Seventh Five Year Plan allocates approximately \$371 million towards science and technology.

C. Economic Analysis

The economic analysis for the Institutional Excellence Project includes an overview of the education sector--especially higher education--in the context of Pakistan's economy and its manpower needs. It then considers in some detail the economic costs and benefits associated with higher education in Pakistan. These costs and benefits are then combined to discuss the economic returns to investments in higher education in Pakistan.

Overall, the economic analysis takes an indirect approach to assessing the economic justification of the IEP. This project provides resources for higher education so as to improve its quality. The economic returns to improvements in educational quality are notoriously difficult to measure--especially before they occur. Nevertheless, it is reasonable to expect that the returns to quality improvements will be at least as great as the overall returns to higher education. In fact, they will likely be greater since the IEP is designed to address particular weaknesses in the higher education system. Thus the economic analysis focuses on assessing the current returns to higher education in Pakistan. If these returns can be shown to be acceptably high, and assuming that the specific quality-oriented interventions provided under the IEP address key constraints on the higher education system, then one should have a reasonable indirect economic justification of the project.

The principal findings of this economic analysis are as follows:

- Manpower projections indicate an increasing relative demand for highly trained workers.
- At present, the only quantifiable benefits of higher education in Pakistan are the resulting increased lifetime earnings. These additional earnings are apt to grow in the future if the manpower projections described above are borne out. In addition, improved higher education is likely to result in a variety of external benefits in the form of better research and more timely and appropriate technology transfer. Furthermore, the IEP will provide the funds for teaching and graduate research assistants. This will enable university faculty to undertake research projects related to high priority national or provincial needs and keep up to date with current technology and scientific research methodologies.

- The costs of higher education in Pakistan are themselves high--relative to both other countries and other levels of education in Pakistan. If educational reforms at primary and secondary levels eventually lead to an increased cadre of students in higher education, then economies of scale may permit the per student cost of higher education to be reduced (without any quality reduction).
- The high recurrent cost of higher education in Pakistan raises an issue of direct relevance to IEP. Only a very small fraction of this recurrent cost is covered by tuition and fees. The remainder must be paid with GOP funds. The current, and likely medium term, scarcity of GOP resources emphasize the need for higher education to mobilize more resources on its own to apply towards recurrent costs. Otherwise, any quality improvements achieved by the IEP may be threatened by annual underfunding of higher education by the GOP.
- The current economic returns to higher education for males are estimated to be between 3-11 percent depending on terminal degree. Returns for females are significantly lower due to low labor force participation rates. In reality, these are probably lower bound estimates since they do not capture the external benefits described above and do not reflect the increased relative demand for highly skilled workers projected for the future. In addition, economic returns to the IEP may be considerably higher since it is designed to address particular weaknesses in the higher education system.

Economic returns are apparently much higher from primary education, but not for secondary education. USAID as well as other donors are addressing the needs of primary education in separate projects. Given the critical role which higher education is acknowledged to play in a country's development process, the limited absorptive capacity of the primary education sector over the short-run, and the factors highlighted above, the IEP appears to form an integral part of an efficient USAID approach for addressing needs in the education sector.

XII. EVALUATION ARRANGEMENTS

The project evaluation plan is designed to provide information for (1) tracking the project progress in terms of inputs, outputs and purpose level achievement; (2) reconfirmation of basic assumptions; (3) modification of existing activities as appropriate; and (4) USAID/GOP dialogue on policy issues. Project evaluations will complement the Management Information System that will be developed to monitor ongoing project performance. Project evaluation will focus on the following issues:

1. Project implementation concerns, including timing, level and quality of major inputs, particularly technical services, commodities and training.

2. Achievement of outputs, including both immediate and readily measured outputs, such as students, faculty, scientists, and technicians trained, linkages between Pakistani and U.S. institutions functioning, and administrative system for encouraging, reviewing and supporting scientific and technological research established.

3. Progress towards project impact on Pakistan's higher education system or purpose level achievement, including Pakistani universities directing efforts and resources towards overcoming specific development problems, obtaining adequate resources to undertake training and research activities, providing higher quality training for larger numbers of scientists and technicians, and producing and publishing greater variety and improved quality of research.

4. Basic assumptions, including the relationship between science and technology and development; Pakistan's dependence on its elite universities as opposed to foreign institutions to carry out research for continuing development and to educate qualified scientists; the GOP's commitment to the education sector and the support of science and technology, as evidenced through sufficient budgetary support.

5. Adjustments in assumptions and inputs based on lessons learned, corrections in Institutional Development Plans as appropriate.

6. Information needed for policy dialogue on GOP recurrent costs, financial incentives for scientific and technological activities, optimization of enrollments and faculty use, decentralization of the management of higher education, lowering public unit costs of higher education.

A. Project Evaluation Schedule

The project's proposed evaluation schedule is timed to provide a full record of project experience thereby serving as a guide to those designing the Institutional Development Plans for Phase II of the project and implementing ongoing activities. The principal events in the evaluation/design calendar are shown below.

These external evaluations will be a joint USAID/GOP exercise, with the contractor providing a supporting role as required. It is anticipated that personnel from AID/W will be requested to participate in addition to outside consultants. The budget for evaluation activities is found in Section VI.

Evaluation - Design Calendar

Institutional Plan developed for first three Centers	Jan 1990
Implementation begins on first three Centers	May 1990
Evaluation/Assessment	Aug 1991
Institutional Plan developed for second three Centers	Sep 1991
Implementation begins on second three Centers	Dec 1991
Evaluation/Assessment	Oct 1992
Institutional Plan developed for third three Centers	Nov 1992
Implementation begins on third three Centers	Feb 1993
Mid-term Evaluation	Jan 1995
Final Evaluation	Jan 1999

B. Evaluation Events

The major evaluation events will include:

1. First and second evaluation/assessments (August 1991 and October 1992, respectively) will assess the difficulties encountered in the design of detailed Institutional Development Plans and the mobilization of efforts to implement those plans. These early evaluations/assessments will shed information on some of the lessons learned in the start-up of project activities. The results will be incorporated into the design of the following Institutional Development Plans. These types of evaluations/assessments are essential in a project such as this which is phasing both design and implementation activities.

2. The mid-term evaluation is timed to examine the progress towards output achievement and the validity of the project concept in view of the implementation activities underway. This evaluation will provide a more indepth analysis of the entire project, particularly in terms of progress being made towards purpose level achievement.

3. A final evaluation will assess output and purpose achievement as well as the socio-economic impact of the project. This evaluation will also make a determination of project implications for future programming in Pakistan's higher education sector.

XIII. WAIVERS, CONDITIONS AND COVENANTS

A. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Project shall have their source and origin in the United States (A.I.D. Code 000) or Pakistan as their place of nationality, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the United States (A.I.D. Code 000) or Pakistan as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

B. Conditions Precedent to First Disbursement

Prior to the first disbursement under the Grant or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Cooperating Country will, except as the parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., a statement of the person(s) representing the Cooperating Country for purposes of the Project, together with a specimen signature of each person specified in such statement.

C. Additional Disbursement: Construction Activities

Prior to disbursement under the Grant for construction/renovation, or to the issuance by A.I.D. of documentation pursuant to which such disbursement shall be made, the Cooperating Country will, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., final plans and specifications including cost estimates for such construction/renovation.

D. Conditions Precedent

Prior to any disbursement for the Small Grant Component, or to the issuance of any commitment under the Project Agreement(s) related to the Small Grant component, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D., evidence of a system for establishing and staffing Technical Committees and an Advisory Board to review and approve recommendations for recipient of the Small Grants.

E. Covenants

The Cooperating Country shall covenant that, except as A.I.D. may otherwise agree in writing:

1. It will make available, qualified candidates, for long and short-term academic training in the U.S. on a timely basis, and it will take all the appropriate steps to ensure that such candidates are assigned upon their return to suitable positions within the Centers of Excellence, Centers of Advanced Studies or university departments.

2. It will develop and approve a plan which outlines the steps required to make higher education more financially self-sustaining.

3. It will participate, along with A.I.D., in evaluations, assessment and monitoring of all project funded activities.

4. It will maintain a regular schedule of operation for project assisted institutions throughout the school year, despite any university-wide disturbances.

Structure of Education Sector

Pakistan inherited a British colonial system of education, including Christian missionary and private schools. The basic organization is:

- a. Primary School - From Grades 1 through 5
- b. Middle School - Grades 6 through 8
- c. Secondary - Grades 9 and 10, after which a matriculation examination is taken.
- d. Intermediate College - Grades 11 and 12, after which the Intermediate examination is taken.
- e. B.A., B.Sc. or B.Comm. is granted after 2 more years of study.
- f. University Education begins with the M.A., M.Sc. level, granted after 2 more years of study.
- g. Graduate Programs: M.Phil. is awarded after an additional 1 to 3 years.
- h. Graduate Programs: Ph.D. is awarded after an additional 2 years following the M.Phil.

The university is an autonomous body with either the Provincial Governor or the President as Chancellor, depending upon the original Charter. The Vice-Chancellor, appointed by the Chancellor, is the principal executive and academic officer of the institution.

The responsibilities of the federal government in higher education are administered by the Ministry of Education and include: financing of universities (since 1978), policy and education standards, promotion of special studies, area study centers, Centres of Excellence and Advanced Studies, Islamic education, and coordinating the efforts of the provinces.

Relation of IEP to USAID Projects

Many of the USAID's on-going projects have indirect research components upon which IEP will build. For instance, the Management of Agricultural Research and Technology (MART) project and its predecessor Agricultural Research (ARP) project both helped provide Pakistan with a cadre of agricultural scientists, through support to the Center of Advanced Studies Applied Genetics and Saline Agriculture, University of Agriculture, Faisalabad. These projects have trained a critical mass of researchers at renowned U.S. institutions, while constructing research stations and filling them with basic equipment. What is needed now is to capitalize on these investments by providing the scientists the wherewithall to undertake high quality focused and useful research.

On a larger scale, the Transformation and Integration of the Provincial Agricultural Network project (TIPAN) seeks to develop an outstanding education-and-research institution at the Agricultural University at Peshawar. Like MART, TIPAN has financed training and equipment, but the project focuses on how education and research can be teamed and harnessed for economic (and social) development. The project has spurred the merging of the Agricultural University with the provincial research capability, and is moving to make the product of the fused institution increasingly relevant to the needs and aspirations of the farmers of the NorthWest Frontier Province. The Institutional Development Component of IEP is similarly conceived. The object here will be to support the capability of a department or similar group of scientists to pursue high quality research dealing with the basic problems that constrain the development of the country.

In the energy field USAID has also been active in financing higher education for key individuals in such fields as geology, coal technology, energy conservation, power planning and environmental assessment. Each of the major energy and environment projects have also included small elements of direct support in research and/or technology transfer. Examples include the introduction of new power generation technologies (fluidized bed combustion and combined cycle gas generation) that may be adapted to Pakistani conditions, research in coal petrology and petrography, and the development of national energy planning computer modeling programs.

More details on research that has been funded by USAID since 1982 is given in a catalogue of science and technology activities recently commissioned by the Mission. The list is impressive; the following are highlights:

- A \$450,000 grant from the Agricultural Commodity and Equipment project enabled the Center for Advanced Molecular Biology at the University of the Punjab at Lahore to acquire scientific equipment and finance research that has had exciting results in the field of restriction enzymes.
- Under the Food Security Management project, Post Harvest Management component implementation contractors have collaborated with Pakistani counterparts (which include the Agricultural University at Faisalabad) in the following research areas: the biology and behavior of the wild boar; evaluation of cultural and non-chemical methods of vertebrate pest control; porcupine and parakeet biology and ecology.
- Under the same project, the Storage Technology and Development Transfer component has financed research into pesticide residues, monitoring for insect resistance to pesticides and the ecology of storage losses.
- The Forestry Planning and Development project provides the Pakistan Forest Institute with \$500,000 for research. Projects are approved and monitored by a committee, with a project contractor acting as technical advisor. Topics include species trials establishment of seed orchards, intercropping under rainfed and irrigated conditions for fodder and fuel wood trees and the effects of inoculation on selected species.
- The Irrigation Systems Management project has provided \$750,000 to the Pakistan Council for Research in Water Resources, which it uses for two year grants for research in irrigation management. Topics include identification of sources of waterlogging and salinity, water use for rice under different planting techniques and the operation and evaluation of trickle irrigation systems in Pakistan.
- The Management of Agricultural Research and Technology project has financed a long-standing link between the Pakistan National Agricultural Research Center (NARC) and the International Wheat and Maize Improvement Center (CIMMYT, based in Mexico). Some very successful collaborative research has resulted. Most notably, a system of planting wheat at the time of rice harvest directly into rice stubble has been developed that has increased yields by one ton per hectare and decreased cost by up to Rs. 800/ha. New germplasm has also been developed, allowing Pakistani scientists to work on high yielding disease resistant plant varieties.

- MART has also financed research at Baluchistan's Arid Zone Research Institute with the help of the International Center for Agricultural Research in Dry Areas. Topics include range-livestock production constraints, improvements in efficiency in the use of water in rainfed areas and cereals and legumes production in high elevation areas.
- TIPAM research topics include the use of spectrophotometer to identify organic molecules for experiments in food preservation, analysis of the fat, fiber and protein content of local animal feed supplements and the analysis of previously unstudied local foods for pesticide load, iodine content and other minerals.
- Under the Coal-REAP component of the Energy Planning and Development Project (EP&D) the US Geological Survey have been working with the Geological Survey of Pakistan to develop an understanding of the nation's coal, oil and gas resources. Both geophysical and lithologic logging have been introduced in Pakistan for the first time. From the fourth year of the project all research has been managed by Pakistani scientists.
- EP&D has also financed research at the Fuel Research Centre through the Pakistan Council for Scientific and Industrial Research. The Centre is undertaking studies to analyze the structure of Pakistani coals and to determine the physical and chemical processes which formed them. The Center also develops technologies for the exploitation of indigenous fuels and provides analytical and consultancy services for private firms and public sector agencies working in coal. Using EP&D and Energy Commodities and Equipment (ECE) funding, the Center has also undertake detailed research leading to the development of an acceptable coal briquette for use as an alternative to fuelwood.
- On the technology front, EP&D, through the Lakhra Coal component, played a key role in introducing the fluidized bed technology to Pakistan. This technology is used to build environmentally acceptable power plants for poor quality fuels.
- With the help of an EP&D financed US contractor, the Energy Wing of Pakistan's Ministry of Water and Power has developed RESPAK, Reference Energy System Pakistan, an energy planning computer model used to integrate the supply and demand for each energy sector (oil, gas, hydro, etc.) and prepare national energy balances for multiple time periods.

- The Rural Electrification project introduced a highly successful new technology to Pakistan--combined cycle gas power generation. Success at the USAID-financed Guddu power plant has encouraged Pakistan's Water and Power Development Authority (WAPDA) to develop an indigenous capability to use the technology and upgrade existing plants; the first to be improved is the gas turbine plant at Faisalabad.
- Over the years, USAID has financed many malaria research projects. Under the current amendment to the Malaria Control-II Project some \$300,000 will be used by the National Institute of Malaria Research and Training. Almost 20 topics have been identified for attention during the next four years.
- For family planning, USAID has financed research undertaken by both the National Research Institute for Reproductive Physiology and the National Institute of Population Studies. Plans are underway for research into contraceptives based on eastern medicine and indigenous materials and the collection of demographic data that will form the basis for the nation's future health and population programs.

Other Donor Contribution to Higher Education

1. Establishment of a Post Graduate Course
Information Studies - UNESCO \$ 7,000
One month consultant mission to advise on the feasibility of
establishing a post-graduate course in information studies.
2. Curriculum Development - U.K. \$280,898
Link between Curriculum Wing of Federal Ministry of Education and
British University - aim - provide advice of teacher training,
support facilities and priorities in curriculum.
3. Allama Iqbal Open University (AIU), Phase III - U.K. \$2,715,355
Project to develop central facilities of AIU through TA, long and
short, training in U.K, equipment and books.
4. Science Equipment for University of Baluchistan - U.K. \$969,000
5. Scientific Literature - Netherlands \$1,198,000
Scientific journals and books for Pakistan University and research
institutes.
6. Equipment for H&J Institutes of Chemistry, Karachi
- U.K. \$2,340,824
Equipment, T.A. and links with British University in fields of
chemistry.
7. Book Presentation Scheme - U.K. \$327,000
Presentation of books to libraries of educational and research
establishments.
8. Science Education - OPEC Special Fund \$5,000,000
Establishment of new and strengthening of existing science
educational schools and institutes.

9. Improvement of Educational Equipment, Mehran University of Engineering & Technology, Jamshoro - Japan \$8,012,000
Highly advanced teaching aids and research equipment for engineering students.
10. Educational Equipment for Baluchistan - Khuzdar Engineering College - Japan \$5,276,422
Highly sophisticated teaching aids.
11. Scientific Instrumentation Center - UNDP \$304,400
Establish facilities for maintenance, repair and calibration of scientific, medical educational and industrial instruments and laboratory equipment in NWFP - through Peshawar University of Engineering.
12. English Language Program - U.K. \$936,329
Implement agent - Federal Ministry of Education and each Provincial Education Department. Program for english language teaching at Masters level at universities and language center.
13. English Language Program - U.K. \$3,500,000
- Implementing agent - UGC
- Development of English language at tertiary level
14. Lahore Graduate School for Business Admin. Sweden \$77,187
Designing education material, visiting lecturers from Sweden.
15. University Links Program - U.K. \$4,200,000
Links in specific fields between universities in Pakistan and U.K.
16. Improvement Project for H.E.J. Research Institutes of Chemistry, Karachi University - Japan \$7,737,000
Purchasing scientific research equipment necessary for conducting research in chemistry.

Commodity Requirements
Center of Excellence in Geology,
University of Peshawar

X-Ray Diffraction Laboratory

- o High-quality, high-capacity power conditioning equipment for 220V, 30 amp X-ray generator (Transector type system)
- o Diffracted-beam, curved crystal graphite monochromator
- o Full set of JCPDS Inorganic and Organic diffraction files

Geochemistry Laboratory

- o Atomic absorption spectrophotometer, polarizing Zeeman, with both flame and graphite furnace atomization and autosampler (Hitachi model 2-800 or equivalent)
- o Elemental analyzer for sulfur, carbon, oxygen and nitrogen analysis in the 10ppm to 100% range
- o Platinum crucibles and platinum dishes (10 each), for high-temperature ignition and fusion of rock samples
- o Muffle furnaces, one large and one small, with digital readout and control, capable of at least 1050 deg. C (Thermolyne)

Petrography Laboratory

- o Polarizing microscopes (10 each) with Bertrand lens (Ogawa Seiki Co., Ltd., Japan model TYL-3-ED-C)
- o Automatic point counters (2 each)
- o Full set of refractive index liquids (1.35 - 2.5)

Sedimentation/Rock Mechanics Laboratory

- o Cathodoluminescence microscope, Nuclide Corporation
- o X-radiograph
- o Research microscope with multibinoculars
- o Ultrasonic homogenizer, Braunsonic 1510

- o Ultrasonic bath, Mettler
- o Centrifuge, International Model K (2 each)
- o Electronic balance, Mettler, 2000g capacity
- o Electronic balance, Mettler, 160g analytical
- o Water distillation unit, Corning
- o Convection oven, Thelco
- o Muffle furnace, Thermolyne
- o Vacuum pump, Genco

Microprobe/Sem Laboratory

- o High capacity, very high quality, power conditioning unit (Transector type system)
- o Energy dispersive spectrometer, Kevex, with Peltier cooled detector (no liquid nitrogen)
- o Two wavelength dispersive spectrometers to supplement existing spectrometers on microprobe (JXA-733)
- o Sputter coater for gold, gold-palladium, or silver coating of samples
- o 4X5" camera back for Type 55 Polaroid positive/negative film
- o Automatic metallurgical polisher, Marumoto model 7705

X-Ray Fluorescence Laboratory

- o High capacity, very high quality power conditioning unit (Transector type system)
- o Automatic fused-bead maker, including Pt-Au dishes, Claisse type
- o Refrigerated water chiller for Shimadzu fluorescence spectrometer
- o Topaz analyzing crystal

- o High temperature muffle furnace, digital readout and control, Thermolyne
- o Large capacity drying oven, 250 deg. C. maximum, Thelco

Paleomagnetism/Geophysics Laboratory

- o Magnetic susceptibility system (ASC Scientific Ltd., USA)
- o Magnetometer for paleomagnetism (Schonstedt Instrument Co.)
- o Curie balance with electromagnets and remnance plotter (Palmray Instruments Co.)
- o Portable drill (Pemroy Instruments)
- o UPS standby battery power

Other Miscellaneous Laboratory Needs

- o Plain paper copier with enlarging and reducing capabilities
- o IBM System 2 or AT computer systems w/hard disk
- o Laser printer and scanner
- o Audiovisual equipment (2 VCRs, 2 color monitors, 1 VCR camera with optical microscope adapter)

COST NOTES

A. Technical Assistance

The cost estimates for technical assistance provide for 111 (42 and 69 for Phase I and Phase II) faculty exchanges; that is to say U.S. academicians posted to Pakistani universities. The duration of each stay ranges between 9 months and 2 months. This translate into approximately 544 person-month (210 and 334 for Phase I and Phase II) over the life of the ten year project. The salaries are budgeted at \$70,000 annually which is less than the maximum permissible under the AID rules. Fringe benefits are assumed to be 30 percent of the salary, post differential is budgeted at 20 percent of the base salary, Sunday differential at 5 percent of the base salary, DBA at 2.67 of the salary base, overhead is budgeted at 40 percent of the salaries and benefits. The budget for visiting professors also provides for in-country per diem for entire duration of the stay and two roundtrips between Karachi and Islamabad. Provision is also included for travel to and from Pakistan, international per diem and other direct costs. The total budgeted under this expense category totals \$9,692,000 (Table 22) of which \$3,738,000 is for Phase I (Table 1) and \$5,954,000 for Phase II (Table 11).

B. Training

1. Long-term Training

Provision is made a total of 122 trainees, 50 in Phase I and 72 in Phase II. The duration of each training is averaged at two years and includes Ph.Ds and Master Degree programs. Budget provision for annual cost is \$24,000 and is considered sufficient for tuition and living expenses. Economy round-trip air fare is also included. Total amount budgeted for long-term training is \$3,294,000 (Table 23), \$1,350,000 in Phase I (Table 2) and \$1,944,000 in Phase II (Table 12).

2. Short-term Training

The budget provides for a total of 459 trainees, 147 in Phase I and 312 in Phase II. The average duration of a course is assumed to be two months and is estimated to cost \$3,500 per month which includes both per diem and tuition. Economy round-trip air fare is budgeted separately. The total amount budgeted for short-term training is \$4,590,000 (Table 24), \$1,470,000 for Phase I (Table 3) and \$3,120,000 for Phase II (Table 13).

C. Commodities

The total amount budgeted under this expense category is \$8,480,000, (Table 25), of this \$3,020,000 is budgeted under Phase I (Table 4) and \$5,460,000 under Phase II (Table 14). The amount was determined on a percentage basis of the total cost of the project. The commodities

envisaged under this expense category include research equipment, books, journals, audio visual equipment and mini and micro-computers. The detailed list of commodity requirements will be developed by the cooperator and each institute or department under the Institutional Development Plan.

D. Construction

The cost estimates for construction are based upon rehabilitation of 59 laboratories (27 in Phase I and 32 in Phase II), rehabilitation of 112 mini computer rooms (39 in Phase I and 73 in Phase II) and rehabilitation of 307 micro-computer rooms (107 in Phase I and 200 in Phase II). The total amount budgeted is \$2,129,250 (Table 26), of this \$793,250 is under Phase I (Table 5) and \$1,336,000 under Phase II (Table 15). The average cost of rehabilitation of a laboratory is budgeted at \$8,000, rehabilitation of mini computer room at \$10,000, and rehabilitation of a micro-computer room at \$1,750. The detailed cost estimates are given below in Table D-1, D-2 and D-3 for the respective categories.

Table D-1
Rehabilitation of Scientific Laboratories
Cost Estimate

Laboratory Facility

Area (25 students), 700 sq ft

Walls, doors, windows and synthetic tile flooring, 700 @ \$8.05/sq ft	\$5,635	
Painting	250	
Flourescent Lightsd	690	
Electrical Wiring	<u>175</u>	
Cost of One Site		\$ 6,750

A/E SERVICES

Design	403	
Supervision	<u>635</u>	<u>\$ 1,038</u>

Total Budget - One Laboratory		\$ 7,788
	Say	\$ 8,000

Table D-2
Rehabilitation of Computer Rooms
Cost Estimate

Mini-Computer Facility
Area, 600 sq ft

Aluminum False Ceiling, 600 @ \$3.85/sq ft	\$2,310	
Walls, doors, windows and synthetic tile flooring, 600 @ \$7.7/sq ft	4,620	
Painting	220	
Flourescent Lights	605	
Electrical Wiring	165	
Cost of one site		\$ 7,920

A/E SERVICES

Design	495	
Supervision	<u>715</u>	<u>\$ 1,210</u>

Total Budget - One Mini-Computer Room		\$ 9,130
	Say	\$10,000

Table D-3

Micro-Computer Facility
Area, 100 sq ft

Aluminum False Ceiling, 100 @ \$4.05/sq ft	405	
Walls, doors, windows and synthetic tile flooring, 100 @ \$8.05/sq ft	805	
Painting	115	
Flourescent Lights	115	
Electrical Wiring	<u>35</u>	
Cost of one site		\$1,475

A/E SERVICES

Design	95	
Supervision	<u>140</u>	<u>\$ 235</u>

Total Budget - One Micro Computer Room		\$1,710
	Say	\$1,750

E. Research Projects

The average annual cost of a research project is estimated to be \$103,000. A research project is assumed to average five year in the Institutional Development Component and approximately three year in the Small Grants Component. The total budget provision of \$8,034,000 (Table 27) would be sufficient to fund approximately 78 years of project research. Phase I will provide \$3,399,000 to fund an approximately 33 years of project research (Table 6) and Phase II will provide \$4,635,000 to fund approximately 45 years of project research (Table 16). A sample research budget for one year is produced below:

Illustrative Annual Costs of a Research Project

Expatriate Visiting Professor: salary and per diem \$17,500 p.m. X 3 months	\$ 52,500
Return Air Fare Denver/Islamabad/Denver	4,000
Pakistani Visiting Professor: per diem = \$3,000 x 3 months	9,000
Return Air Fare Islamabad/Denver/Islamabad	4,000
Field research equipment	2,500
Research Assistants - 4	5,500
Travel, rail, air, etc.	2,500
Transport rental	3,000
Books and journals	<u>2,500</u>
	\$ 85,500
Overhead/indirect costs 20% *	<u>17,100</u>
Total	\$102,600
Say:	\$103,000

* Provision for communications, data input, analysis, etc.

F. Workshops, Seminars and Conferences

The budget reflects three categories of workshops, seminars and conferences. Provision is made for 79 (29 in Phase I and 50 in Phase II) seminars with limited international attendance, and an average cost of one event is assumed to be approximately \$30,000. International conferences with wider attendance and larger scale are assumed to take place only twice (1 in Phase I and 1 in Phase II) during the life of the project. Cost of one such conference is estimated to be approximately \$80,000. Other seminars/workshops with only local participation, conducted/organized by the contractor are assumed to be 143 (53 in Phase I and 90 in Phase II) and each is estimated to cost approximately \$10,000. Sample budgets are given in Table F-1, Table F-2, Table F-3.

Table F-1
Illustrative Budget
Seminar/Workshops

		<u>U.S. Dollars</u>
1. <u>4-Resource Persons from U.S.A.</u>		
i. <u>Travel Cost</u>		
(a) International Travel	a/ =	12,648
(b) In-Country Travel	b/ = (Rs.12,000)	632
ii. <u>Per Diem</u>		
(a) International	c/ =	3,200
(b) Local	d/ =	<u>1,680</u>
Sub-Total (1)		18,160
2. <u>10-Resource Persons from within the Country</u>		
i. Return air fare (@ Rs.3000/RT/person)	=(Rs.30,000)	1,580
ii. Per Diem (@ \$84/day/person for 3 days)	=	2,520
iii. <u>Printing Cost</u> (Report, Invitation Cards, Agenda, etc)	=(Rs.40,000)	<u>2,105</u>
Sub-Total (2)		6,205
3. <u>Other Direct Costs - Rent for Seminar Hall, etc.)</u>	=	5,000
Sub-Total (3)	=	<u>5,000</u>
TOTAL: (1+2+3)	=	29,365
	Say	<u>30,000</u>

Notes

- a/ International Travel @ 3,162/person for four persons.
b/ In-Country travel for 4 persons, 1 RT (Karachi-Islamabad-Karachi) each @ Rs.3,000/RT
c/ International per diem @\$800/person for four persons
d/ Local in-country per diem @ \$84/day for 4 persons with 5 days stay

Exchange Rate used is US \$1.00 = Rs. 19.00

Table F-2
Illustrative Budget
International Conference

<u>Budget Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total</u>
1.0 Printing Expenses			
Conference Program			500 :
Preprints of Papers			5,000
Conference Proceedings	500	20	<u>10,000</u>
Sub-Total: Printing Costs			15,500
2.0 Conference Materials			
Portfolios	500	6.50	3,250
Invitations, Name Tags, etc.			<u>550</u>
Sub-Total: Materials			3,800
3.0 USAID Newspaper Ad in Supplement			3,000
4.0 Invitational Travel, International			
RT, Dallas/Karachi	1	3200	3,200
RT, Bangkok/Karachi	2	500	1,000
RT, Jakarta/Karachi	1	900	900
RT, Manila/Karachi	1	900	900
RT, Beijing/Karachi	2	900	1,800
RT, USA/Karachi	3	2800	8,400
Associated Per Diems	60	80	<u>4,800</u>
Sub-Total: Travel/Living			21,000
5.0 Domestic Travel, within Pakistan			
RT, Islamabad/Karachi	13	138	1,794
RT, Lahore/Karachi	8	138	1,104
RT, Quetta/Karachi	3	106	318
RT, Associated Per Diems, Out-of-Town	96	73	<u>7,008</u>
Sub-Total: Travel/Living			10,224

6.0 Hotel Food/Beverage Services			
Pre-conference Seminar			
Tea Breaks	200	13	2,600
	400	1.50	<u>600</u>
Sub-Total: Seminar			3,200
Committee Meeting	30	13	390
Participants (Pakistan)			:
Lunches (each of 4 days)	1200	13	15,600
Teabreaks (8 over 4 days)	2400	1.50	3,600
Reception	300	13	3,900
Workshop Dinners (2)	100	13	1,300
Speaker's Breakfast (4 days)	80	.6	480
Sub-Total: Participants			24,880
Sub-Total: Hotel Services			28,470
7.0 Sub-Total: All Budget Items			81,994
Say			\$80,000

Notes

Per Diems adjusted to take account of hotel and meal functions.

Budget will be credited with net income from fees charged foreign participant.

Table F-3
Illustrative Budget
Local Participation

	<u>Rupee Amount</u>	<u>Dollar Equivalent</u>
1. All workshop arrangements for 3 days including Audio-visual (250-300 at the inauguration and 80-100 during the sessions)	65,000	3,421
2. Printing charges, invitation cards, program, brochures, proceedings, Report etc. (Printing of proceedings 400 copies, printing of invitation cards for 250-300 persons, brochures and papers for 80-100 persons)	100,000	5,263
3. Domestic Travel Pesh/Khi/Pesh 1 Person = Rs. 3,000	3,000	158
Per Diem = \$105 X 5 days		<u>525</u>
Total 1+2+3+4		9,367
		Say 10,000

Comprehensive Research budget (Phase I and II) is presented in Table 28 and totals \$3,960,000. Phase I will provide \$1,480,000 (Table 7) and Phase II \$2,480,000 (Table 17).

G. Evaluation

The total budgeted under evaluation is \$743,840 (Table 29), of which \$515,600 is budgeted under Phase I (Table 8) and \$228,240 under Phase II (Table 18). The evaluation team will be composed of between one and four persons in Pakistan from two to four weeks including a week for preparation and writing the report. Provision has been made for one roundtrip air fare and other related costs. Salary, per diem and local travel expenses are budgeted at \$21,200 per month. Evaluation activities are assumed to take place on four occasions during the life of the project. The small evaluations/assessments will take place in 1991 and 1993, a larger mid-term in 1995 and a final evaluation at the end of the year i.e. 1999.

H. Cooperative Agreement

The cooperator cost is based upon a presence in Pakistan throughout the life of the project. However, the number of expatriate involvement varies during the life of the project and is assumed to be intensive during the first 4-5 years of the project, during which time it is assumed that Project Academic Director will be based in Pakistan. In year five the Project Academic Director is assumed to shift to the U.S. and spend only a part of his/her time on the project. The salary and related expenses of the Project Director during his/her stay in Pakistan takes into account the salary (\$70,000 per annum), fringe benefits 30 percent of base salary, post differential 20 percent of the base salary, Sunday differential 5 percent of the base salary, DBA at 2.67 percent of the base salary, overhead at 40 percent of salary and other benefits. A provision for home office backstopping amounts to \$10,000 per annum, assuming a person on a salary of \$40,000 spends 25 percent of his/her time with support services to the project director. Provision for recurrent housing expenses is inclusive of storage, education allowance for two children, house rent, utilities, fumigation, maintenance of household equipment, maintenance of leasehold, and a guard. Provision is also made for local travel and six annual international trips to/from the U.S. Provision is also made for one time cost which would occur only on arrival and/or departure. Such costs include air fare to and from post, international per diem, transportation of vehicle, household equipment, unaccompanied baggage, medical evacuation, per diem, emergency leave, rest and recreation, supplementary post allowance, and relocation allowance, and initial equipment of the house which includes cost of furnitures, fixtures, etc., and initial renovation of the house.

Although it may well be that only one extra position is required in Pakistan, that of the field coordinator/administrative officer, an additional position is budgeted for illustrative purposes. Both positions are based on a salary of \$60,000 per annum. All the other costs mentioned in details of the Project Academic Director are also included in the cost estimates of the two expatriate positions. It is expected that in the initial 3-4 years of the project there will be frequent visits of short-term consultants. Provision is made for four short-term consultants visiting

Pakistan annually for a four months duration. A monthly cost of a short-term consultant is budgeted at \$17,000 per month and is considered sufficient to cover the salary, fringe benefits, domestic travel, and international travel of the consultant. Local staff is provided, inclusive of office rent, maintenance, office furniture, and other necessary equipment. The details of the contractor costs for Phase I and Phase II total \$10,150,731 (Table 30). In Phase I \$4,806,150 is budgeted (Table 9) and \$5,344,220 under Phase II (Table 19). It is expected that the home office backstopping of the contractor would need to be quite intensive. Provision is therefore made for four persons involved full-time on the project. The salary scale of the head office support is assumed to be approximately \$50,000 per annum inclusive of all fringe and related benefits. A mark-up of 100 percent of their costs is provided to take into account, all secretarial and communication requirements.

I. Personal Service Contractor

It is assumed that the U.S. PSC would be housed in the office of HRD. Therefore a provision has been made for his/her salary at \$69,000 per annum, post differential, Sunday differential, FICA, and all other recurrent and one time costs identified under the contractor's costs. No provision has been made for any rental of office, maintenance, etc. The total (Phase I and Phase II) budget provides \$1,778,800 (Table 31), for Phase I \$1,266,600 (Table 10) and \$512,200 for Phase II (Table 20).

J. Inflation

Inflation has been calculated at 5 percent compounded for all foreign exchange costs and 10 percent compounded annually for all local currency cost.

H. Contingencies

A contingency factor of 10 percent has been made for all project elements and expense category.

Foreign exchange conversion has been made at Rs. 19.00 = \$1.00. Summaries of project costs by expense category, currency and year of expenditure is presented in Table 32 for Phase I and Table 33 for Phase II.

Institutional Excellence Project
Phase I
Faculty Exchange

Table 1

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of Visiting Professors												
Institutional Dev. A		2	2	2	2	2	2	2	0	0	0	14
Small Grants		2	2	2	2	2	2	2	0	0	0	16
Institutional Dev. B		0	2	0	0	0	0	0	0	0	0	2
Small Grants		2	2	0	0	0	0	0	0	0	0	4
Institutional Dev. C		0	2	0	0	0	0	0	0	0	0	2
Small Grants		2	2	0	0	0	0	0	0	0	0	4
Number of Professors		8	12	4	5	5	4	4	0	0	0	42
Air fares		4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4,000
Salary and related expenses		17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
Ave. duration of stay: Months												
Institutional Dev. A		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Institutional Dev. B		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Institutional Dev. C		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
man months by category												
Institutional Dev. A		18	18	18	18	18	18	18	0	0	0	126
Small Grants		4	4	4	6	6	4	4	0	0	0	32
Institutional Dev. B		0	18	0	0	0	0	0	0	0	0	18
Small Grants		4	4	0	0	0	0	0	0	0	0	8
Institutional Dev. C		0	18	0	0	0	0	0	0	0	0	18
Small Grants		4	4	0	0	0	0	0	0	0	0	8
Total man months		30	66	22	24	24	22	22	0	0	0	210
Total w/o infl./contingency		542000	1170000	390000	428000	428000	390000	390000	0	0	0	3,738,000
plus inflation		574520	1215080	464997	541516	524858	554282	591015	0	0	0	4,515,078
plus contingency		571972	1444582	511497	525668	672244	511921	559117	0	0	0	5,090,106

Institutional Excellence Project
Phase I
Training: Long term

Table 2

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 Totals
Institutional Dev. A		1	3	4	4	4	4	2	0	0	0
Small Grants		1	2	2	2	2	1	0	0	0	22
Institutional Dev. B		0	2	2	0	0	0	0	0	0	10
Small Grants		1	2	2	0	0	0	0	0	0	4
Institutional Dev. C		1	3	2	0	0	0	0	0	0	5
Small Grants		0	1	1	1	0	0	0	0	0	6
Number of trainees		4	13	13	7	6	5	2	0	0	50
Air fares		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Per diem, tuition etc @ \$2,000 pm		24000	24000	24000	24000	24000	24000	24000	24000	24000	24000
Total w/o infl./contingency		108000	351000	351000	189000	162000	135000	54000	0	0	0 1,350,000
plus inflation		118200	391170	413088	234951	212774	187385	79233	0	0	0 1,636,801
plus contingency		130020	430287	454397	258446	234051	206123	87156	0	0	0 1,800,481

Institutional Excellence Project
Phase I
Training: Short term

Table 1

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		5	10	12	15	15	15	15	0	0	0	87
Small Grants		2	4	4	5	5	4	4	0	0	0	28
Institutional Dev. B		0	10	0	0	0	0	0	0	0	0	10
Small Grants		2	4	0	0	0	0	0	0	0	0	6
Institutional Dev. C		0	10	0	0	0	0	0	0	0	0	10
Small Grants		2	4	0	0	0	0	0	0	0	0	6
Number of trainees		11	42	16	20	20	19	19	0	0	0	147
Air fares		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Per diem and tuition etc for two months \$3,500 pm		7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	
Total w/o infl./contingency		110000	420000	160000	200000	200000	190000	190000	0	0	0	1,470,000
plus inflation		117150	476595	193542	258017	275510	279212	298221	0	0	0	1,898,047
plus contingency		128865	524255	212896	283819	302841	307133	328043	0	0	0	2,087,852

Institutional Excellence Project
Phase I
Commodities.

Table 4

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		100000	200000	500000	500000	500000	250000	155000	0	0	0	2,205,000
Small Grants		30000	50000	75000	100000	150000	100000	50000	0	0	0	555,000
Institutional Dev. B		0	50000	0	0	0	0	0	0	0	0	50,000
Small Grants		30000	50000	0	0	0	0	0	0	0	0	80,000
Institutional Dev. C		0	50000	0	0	0	0	0	0	0	0	50,000
Small Grants		30000	50000	0	0	0	0	0	0	0	0	80,000
Sum		190000	450000	575000	600000	650000	350000	205000	0	0	0	3,020,000
Inflation		9500	46125	90634	129304	179583	119033	83456	0	0	0	657,635
Contingency		19950	49613	66363	72930	82958	46903	28846	0	0	0	367,764
TOTAL		219450	545738	732198	802234	912541	515937	317301	0	0	0	4,045,399
total w/o contingency		199500	496125	665634	729304	829583	469033	288456	0	0	0	3,677,635

Institutional Excellence Project
Phase 1
Construction Budget

Table 5

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of undertakings												
Institutional Dev. A												
rehabilitation Labs.		0	3	2	3	3	2	2	0	0	0	15
rehab. computer room mini		0	4	4	4	5	4	4	0	0	0	24
rehab. computer room micro		0	8	10	10	10	10	10	0	0	0	58
Small Grants												
rehabilitation Labs.		0	0	1	2	2	2	1	0	0	0	8
rehab. computer room mini		0	0	1	1	1	1	1	0	0	0	5
rehab. computer room micro		0	5	5	5	5	5	5	0	0	0	30
Institutional Dev. B												
rehabilitation Labs.		0	1	0	0	0	0	0	0	0	0	1
rehab. computer room mini		0	4	0	0	0	0	0	0	0	0	4
rehab. computer room micro		0	8	0	0	0	0	0	0	0	0	8
Small Grants												
rehabilitation Labs.		0	1	0	0	0	0	0	0	0	0	1
rehab. computer room mini		0	0	0	0	0	0	0	0	0	0	0
rehab. computer room micro		0	2	0	0	0	0	0	0	0	0	2
Institutional Dev. C												
rehabilitation Labs.		0	1	0	0	0	0	0	0	0	0	1
rehab. computer room mini		0	5	0	0	0	0	0	0	0	0	5
rehab. computer room micro		0	7	0	0	0	0	0	0	0	0	7
Small Grants												
rehabilitation Labs.		0	1	0	0	0	0	0	0	0	0	1
rehab. computer room mini		0	0	0	0	0	0	0	0	0	0	0
rehab. computer room micro		0	2	0	0	0	0	0	0	0	0	2
* rehabilitation Labs.		0	7	3	5	5	4	3	0	0	0	27
* rehab. computer room mini		0	13	5	5	6	5	5	0	0	0	39
* rehab. computer room micro		0	32	15	15	15	15	15	0	0	0	107
Unit cost												
rehabilitation Labs.		8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	
rehab. computer room mini		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	
rehab. computer room micro		1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total w/o infl./contingency		0	242000	100250	116250	126250	108250	100250	0	0	0	793,250
plus inflation		0	266805	116052	141000	161101	145065	141062	0	0	0	971,417
plus contingency		0	293486	127657	155433	177244	159572	155168	0	0	0	1,068,559

Institutional Excellence Project
Phase 1
Research Projects Budget

Table 6

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Research project years												
Institutional Dev. A		1	2	4	4	4	3	2	0	0	0	20
Small Grants		0	1	2	3	3	2	1	0	0	0	12
Institutional Dev. B		0	1	0	0	0	0	0	0	0	0	1
Small Grants		0	0	0	0	0	0	0	0	0	0	0
Institutional Dev. C		0	0	0	0	0	0	0	0	0	0	0
Small Grants		0	0	0	0	0	0	0	0	0	0	0
Total project years		1	4	6	7	7	5	3	0	0	0	33
Average annual cost		103000	103000	103000	103000	103000	103000	103000	103000	103000	103000	103000
Total w/o Infl./contingency		103000	412000	618000	721000	721000	515000	309000	0	0	0	3,399,000
plus inflation		110725	476375	768985	965998	1040688	801252	518474	0	0	0	4,682,497
plus contingency		121798	524013	845884	1062598	1144757	881377	570321	0	0	0	5,150,747

Institutional Excellence-Project
Phase I
Workshop, Seminars, Conferences

Table 7

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of Events												
Institutional Dev. A												
Intern. Attendance		1	2	2	2	3	2	2	0	0	0	14
Intern. Sponser		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponser		2	5	5	5	5	5	5	0	0	0	32
Small Grants												
Intern. Attendance		1	1	1	1	1	1	1	0	0	0	7
Intern. Sponser		0	0	0	0	1	0	0	0	0	0	1
Domestic Sponser		1	1	1	1	1	1	1	0	0	0	7
Institutional Dev. B												
Intern. Attendance		1	2	0	0	0	0	0	0	0	0	0
Intern. Sponser		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponser		2	5	0	0	0	0	0	0	0	0	7
Small Grants												
Intern. Attendance		1	1	0	0	0	0	0	0	0	0	0
Intern. Sponser		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponser		1	1	0	0	0	0	0	0	0	0	2
Institutional Dev. C												
Intern. Attendance		0	2	0	0	0	0	0	0	0	0	2
Intern. Sponser		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponser		1	3	0	0	0	0	0	0	0	0	4
Small Grants												
Intern. Attendance		0	1	0	0	0	0	0	0	0	0	1
Intern. Sponser		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponser		0	1	0	0	0	0	0	0	0	0	1
No. of Intern. Attendance		4	9	3	3	4	3	3	0	0	0	29
No. of Intern. Sponser		0	0	0	0	1	0	0	0	0	0	1
No. of Domestic Sponser		7	16	6	6	6	6	6	0	0	0	53
Cost per Intern. Attendance		30000	30000	30000	30000	30,000						
Cost per Intern. Sponser		80000	80000	80000	80000	80,000						
Cost per Domestic Sponser		10000	10000	10000	10000	10,000						
Total w/o infl./contingency		190000	470000	150000	150000	260000	150000	150000	0	0	0	1,480,000
plus inflation		203300	463720	178845	199784	349213	213250	227314	0	0	0	1,845,734
plus contingency		223630	531652	196730	208762	384134	233354	250045	0	0	0	2,030,307

Institutional Excellence Project
Phase 1
Evaluation Budget

Table 8

Expense Category	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of persons	-	1	-	3	-	3	-	-	-	-	7
Number of weeks	-	2	-	3	-	4	-	-	-	-	9
Air fares and other		4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	
salary, per diem, local travel		21,200	21,200	21,200	21,200	21,200	21,200	21,200	21,200	21,200	
Totals											
Air fares	0	4,000	0	12,000	0	12,000	0	0	0	0	28,000
Air fares and other costs salary, per diem, loc travel	0	42,400	0	190,800	0	254,400	0	0	0	0	487,600
Sum	0	46,400	0	202,800	0	266,400	0	0	0	0	515,600
Inflation	0	5,642	0	51,431	0	106,756	0	0	0	0	163,828
Contingency	0	5,204	0	25,423	0	37,316	0	0	0	0	67,943
TOTAL	0	57,246	0	279,654	0	410,471	0	0	0	0	747,371
total w/o contingenc	0	52042	0	254231	0	373156	0	0	0	0	679,428

Institutional Excellence Project
Phase I
Contractor Budget

Table 9

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
Project Academic Director												
one time costs		95200	-	-	95200	-	-	-	-	-	-	190,400
recurrent (\$17.2K*12)		137600	206000	206000	206000	206000	48000	48000	-	-	-	1,057,600
r&r		12000	-	-	12000	-	-	-	-	-	-	24,000
travel (\$4k*5) US-Pak		20000	20000	20000	20000	20000	20000	20000	-	-	-	140,000
Field Coordinator/Admin Officer (2)												
one time costs		47600	47600	0	47600	47600	0	47600	-	-	-	238,000
recurrent (\$14,500*12)		58000	177000	177000	177000	177000	177000	177000	-	-	-	1,120,000
r&r		12000	12000	0	12000	12000	0	12000	-	-	-	60,000
travel (\$.135k*12) Isl-Khi		810	810	1620	1620	1620	1620	1620	-	-	-	9,720
		0	0	0	0	0	0	0	-	-	-	
Short term Consultants EST (4)												
arrival/departure (\$4K*4)		8000	8000	8000	8000	0	0	0	-	-	-	32,000
monthly cost (\$17K*4)		34000	34000	34000	34000	0	0	0	-	-	-	136,000
		0	0	0	0	0	0	0	-	-	-	
		0	0	0	0	0	0	0	-	-	-	
Local Professional Staff												
Grade 12/5 (2)		5886	17657	17658	17658	17658	17658	17658	-	-	-	111,831
Grade 11/5		4580	6870	6870	6870	6870	6870	6870	-	-	-	45,800
Grade 11/5		4580	6870	6870	6870	6870	6870	6870	-	-	-	45,800
secretary 7/7		2238	2238	2238	2238	2238	2238	2238	-	-	-	15,663
		0	0	0	0	0	0	0	-	-	-	
		0	0	0	0	0	0	0	-	-	-	
Office Rent												
utilities		9300	13950	13950	13950	13950	13950	13950	-	-	-	93,000
maintenance		3537	5305	5305	5305	5305	5305	5305	-	-	-	35,367
office furniture etc		1335	2000	2000	2000	2000	2000	2000	-	-	-	13,335
		7500	0	0	3750	0	0	0	-	-	-	11,250
		0	0	0	0	0	0	0	-	-	-	
		0	0	0	0	0	0	0	-	-	-	
Professional Computer (3)												
printer 1,200		7500	0	0	0	7500	0	0	-	-	-	15,000
supplies		1800	0	0	0	1800	0	0	-	-	-	3,600
maintenance		670	1000	1000	1000	1000	1000	1000	-	-	-	6,670
photocopier		268	400	400	400	400	400	400	-	-	-	2,668
supplies/maintenance		4500	0	0	0	4500	0	0	-	-	-	9,000
typewriter		170	250	250	250	250	250	250	-	-	-	1,670
supplies/maintenance		650	0	0	0	650	0	0	-	-	-	1,300
vehicles		68	100	100	100	100	100	100	-	-	-	668
maintenance		5125	0	0	5125	5125	0	5125	-	-	-	20,500
driver (1)		1860	2788	2788	2788	2788	2788	2788	-	-	-	18,588
NO backstop (4**\$50k)+100%		1250	1250	1250	2500	2500	2500	2500	-	-	-	13,750
		133335	200000	200000	200000	200000	200000	200000	-	-	-	1,333,335
sum		621361	766087	707298	884223	745723	508548	573273	0	0	0	4,806,310
Inflation (Fx 5% Lc 10%)		37282	94995	-136013	234518	255878	216839	295478	0	0	0	1,271,003
Contingency 10%		65864	86108	84331	111874	100160	72539	86875	0	0	0	607,751
TOTAL		724507	947190	927642	1230614	1101760	797925	955626	0	0	0	6,683,264

Institutional Excellence Project
Phase I
Personal Services Contractor

Table 10

Description	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
PSC											
one time costs	95200	-	-	95200	-	-	95200	-	0	-	285,600
recurrent (\$11.25K#12)	135000	135000	135000	135000	135000	135000	135000	0	0	0	945,000
r&r	12000	-	-	12000	-	-	12000	-	0	-	36,000
sum	242200	135000	135000	242200	135000	135000	242200	0	0	0	1,266,600
Inflation (Fx 5% Lc 10%)	14532	16740	25961	64237	46322	57562	124836	0	0	0	350,190
Contingency 10%	25673	15174	16096	30644	18132	19256	36704	0	0	0	161,679
TOTAL	282405	166914	177057	337081	199454	211819	403739	0	0	0	1,778,469
total w/o contingency	256732	151740	160961	306437	181322	192562	367036	0	0	0	1,616,790

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Institutional Excellence Project
Phase II
Faculty Exchange

Table 11

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of Visiting Professors												
Institutional Dev. A		0	0	0	0	0	0	0	2	0	0	2
Small Grants		0	0	0	0	0	0	0	2	2	2	6
Institutional Dev. B		0	0	2	2	2	2	2	2	0	0	12
Small Grants		0	0	2	3	2	2	2	2	2	2	17
Institutional Dev. C		0	0	2	2	2	2	2	2	2	0	14
Small Grants		0	0	2	3	3	2	2	2	2	2	18
Number of Professors		0	0	8	10	9	8	8	12	8	6	69
Air fares		4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4,000
Salary and related expences		17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
Ave. duration of stay: Months												
Institutional Dev. A		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Institutional Dev. B		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Institutional Dev. C		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
man months by category												
Institutional Dev. A		0	0	0	0	0	0	0	18	0	0	18
Small Grants		0	0	0	0	0	0	0	4	4	4	12
Institutional Dev. B		0	0	18	18	18	18	18	18	0	0	108
Small Grants		0	0	4	6	4	4	4	4	4	4	34
Institutional Dev. C		0	0	18	18	18	18	18	18	18	0	126
Small Grants		0	0	4	6	6	4	4	4	4	4	36
Total man months		0	0	44	48	46	44	44	66	30	12	334
Total w/o infl./contingency		0	0	780000	856000	818000	780000	780000	1170000	542000	228000	5,954,000
plus inflation		0	0	929994	1083033	1098678	1112583	1182031	1884498	926257	415385	8,634,409
plus contingency		0	0	1022993	1191336	1208546	1223842	1300234	2072948	1021083	456924	\$9,497,809

Institutional, Excellence Project
Phase II
Training: Long term

Table 12

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		0	0	0	0	0	0	2	4	4	2	12
Small Grants		0	0	0	0	0	0	0	0	0	0	0
Institutional Dev. B		0	0	2	4	4	4	4	4	3	1	25
Small Grants		0	0	1	2	2	1	0	0	0	0	6
Institutional Dev. C		0	0	2	4	4	4	4	3	1	0	22
Small Grants		0	0	0	1	2	2	1	0	0	0	6
Number of trainees		0	0	5	11	12	11	11	11	8	3	72
Air fares		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Per diem, tuition etc @ \$2,000 pm		24000	24000	24000	24000	24000	24000	24000	24000	24000	24000	
Total w/o infl./contingency		0	0	135000	297000	324000	297000	297000	297000	216000	81000	1,944,000
plus inflation		0	0	158880	369209	425547	412247	435782	460787	354446	140624	2,757,522
plus contingency		0	0	174768	406130	468102	453471	479360	506865	389890	154687	3,033,274

Institutional Excellence Project
Phase II
Training: Short term

Table 13

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		0	0	0	0	0	0	0	12	12	10	34
Small Grants		0	0	0	0	0	0	0	4	4	2	9
Institutional Dev. B		0	0	10	12	15	15	15	15	12	10	104
Small Grants		0	0	4	5	5	5	4	4	4	2	32
Institutional Dev. C		0	0	10	12	12	15	15	15	12	10	101
Small Grants		0	0	4	5	5	5	4	4	4	2	32
Number of trainees		0	0	28	34	37	40	38	54	45	36	312
Air fares		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Per diem and tuition etc for two months \$3,500 pm		7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	
Total w/o infl./contingency		0	0	280000	340000	370000	400000	380000	540000	450000	360000	3,120,000
plus inflation		0	0	338699	438629	509324	587814	596442	793549	754783	645593	4,664,872
plus contingency		0	0	372568	482492	560256	646596	656087	872904	830261	710152	5,131,716

Institutional Excellence Project
Phase II
Commodities

Table 14

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		0	0	0	0	0	0	0	100000	0	0	100,000
Small Grants		0	0	0	0	0	0	0	50000	25000	25000	100,000
Institutional Dev. B		0	0	100000	200000	500000	500000	250000	125000	60000	25000	1,760,000
Small Grants		0	0	75000	100000	200000	50000	50000	50000	50000	50000	625,000
Institutional Dev. C		0	0	100000	200000	500000	500000	500000	250000	100000	50000	2,200,000
Small Grants		0	0	50000	75000	100000	200000	100000	50000	50000	50000	675,000
Sum		0	0	325000	575000	1300000	1250000	900000	625000	285000	200000	5,460,000
Inflation		0	0	51228	123916	359166	425120	366390	298410	157129	125779	1,907,137
Contingency		0	0	37623	69892	165917	167512	126639	92341	44213	32578	736,714
TOTAL		0	0	413851	768808	1825083	1842632	1393029	1015751	486341	358357	8,103,851
total w/o contingency		0	0	376228	698916	1659166	1675120	1266390	923410	442129	325779	7,367,137

Institutional Excellence Project
Phase II
Construction Budget

Table 15

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
Number of undertakings												
Institutional Dev. A												
rehabilitation Labs.		0	0	0	0	0	0	0	2	0	0	2
rehab. computer room mini		0	0	0	0	0	0	0	0	0	0	0
rehab. computer room micro		0	0	0	0	0	0	0	5	0	0	5
Small Grants												
rehabilitation Labs.		0	0	0	0	0	0	0	0	0	0	0
rehab. computer room mini		0	0	0	0	0	0	0	1	0	0	1
rehab. computer room micro		0	0	0	0	0	0	0	5	5	5	15
Institutional Dev. B												
rehabilitation Labs.		0	0	2	2	2	1	0	0	0	0	7
rehab. computer room mini		0	0	5	4	4	4	4	4	4	4	31
rehab. computer room micro		0	0	10	10	10	10	10	5	0	0	55
Small Grants												
rehabilitation Labs.		0	0	1	1	1	1	1	1	1	1	8
rehab. computer room mini		0	0	1	1	1	1	1	0	0	0	6
rehab. computer room micro		0	0	5	5	5	5	5	5	5	5	40
Institutional Dev. C												
rehabilitation Labs.		0	0	2	2	2	2	1	0	0	0	9
rehab. computer room mini		0	0	4	4	4	4	4	3	3	3	25
rehab. computer room micro		0	0	10	10	10	10	10	10	0	0	60
Small Grants												
rehabilitation Labs.		0	0	1	1	1	1	1	1	0	0	6
rehab. computer room mini		0	0	1	1	1	1	1	0	0	0	5
rehab. computer room micro		0	0	5	5	5	5	5	0	0	0	25
# rehabilitation Labs.		0	0	6	6	6	5	3	4	1	1	31
# rehab. computer room mini		0	0	11	10	10	10	10	8	7	7	71
# rehab. computer room micro		0	0	30	30	30	30	30	30	10	10	200
Unit cost												
rehabilitation Labs.		8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	
rehab. computer room mini		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	
rehab. computer room micro		1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total w/o infl./contingency		0	0	210500	200500	200500	192500	176500	164500	95500	95500	1,175,000
plus inflation		0	0	241680	241709	257494	257968	248157	243041	148152	155559	1,179,600
plus contingency		0	0	268048	268069	281484	287785	277189	267746	162767	171118	1,197,500

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Institutional Excellence Project
Phase II
Research Projects Budget

Table 16

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Research project years												
Institutional Dev. A		0	0	0	0	0	0	0	1	1	0	0
Small Grants		0	0	0	0	0	0	0	0	0	0	0
Institutional Dev. B		0	0	2	3	3	3	2	1	1	0	15
Small Grants		0	0	1	2	2	1	0	0	0	0	6
Institutional Dev. C		0	0	1	2	3	3	3	2	1	1	16
Small Grants		0	0	0	1	2	2	1	0	0	0	6
Total project years		0	0	4	8	10	9	6	4	3	1	45
Average annual cost		103000	103000	103000	103000	103000	103000	103000	103000	103000	103000	103000
Total w/o Infl./contingency		0	0	412000	824000	1030000	927000	618000	412000	309000	103000	4,635,000
plus inflation		0	0	512657	1103998	1486698	1442253	1036948	745935	603983	217466	7,149,937
plus contingency		0	0	563922	1214398	1655367	1586478	1140642	820529	664381	239212	7,864,930

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Institutional Excellence Project
Phase II
Workshop, Seminars, Conferences

Table 17

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 Totals	
Number of Events												
Institutional Dev. A												
Intern. Attendance		0	0	0	0	0	0	0	2	2	0	4
Intern. Sponsor		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponsor		0	0	0	0	0	0	0	5	5	3	13
Small Grants												
Intern. Attendance		0	0	0	0	0	0	0	1	0	0	1
Intern. Sponsor		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponsor		0	0	0	0	0	0	0	1	1	0	2
Institutional Dev. B												
Intern. Attendance		0	0	2	2	2	2	2	2	2	2	16
Intern. Sponsor		0	0	0	0	0	1	0	0	0	0	1
Domestic Sponsor		0	0	5	5	5	5	5	5	5	2	37
Small Grants												
Intern. Attendance		0	0	1	1	1	1	1	1	1	0	7
Intern. Sponsor		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponsor		0	0	1	1	1	1	1	1	0	0	6
Institutional Dev. C												
Intern. Attendance		0	0	2	2	2	2	2	2	2	0	14
Intern. Sponsor		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponsor		0	0	3	3	3	3	3	5	5	2	27
Small Grants												
Intern. Attendance		0	0	1	1	1	1	1	1	1	1	8
Intern. Sponsor		0	0	0	0	0	0	0	0	0	0	0
Domestic Sponsor		0	0	1	1	1	1	1	0	0	0	5
Summary												
No. of Intern. Attendance		0	0	6	6	6	6	6	4	8	3	50
No. of Intern. Sponsor		0	0	0	0	0	1	0	0	0	0	1
No. of Domestic Sponsor		0	0	10	10	10	10	10	17	16	7	90
Costs												
Cost per Intern. Attendance		30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30,000
Cost per Intern. Sponsor		80000	80000	80000	80000	80000	80000	80000	80000	90000	80000	80,000
Cost per Domestic Sponsor		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10,000
Total w/o infl./contingency												
plus inflation		0	0	280000	280000	280000	760000	280000	440000	400000	160000	2,480,000
plus contingency		0	0	337844	354267	376076	517500	324719	708700	685061	191498	3,687,250
		0	0	367228	389687	417687	564850	466751	779570	753567	320648	4,033,987

Institutional Excellence Project
Phase II
Evaluation Budget

Table 18

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of persons		-	-	-	-	-	-	-	-	-	3	3
Number of weeks		-	-	-	-	-	-	-	-	-	3	3
Air fares and other costs			4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	
salary,per diem,local travel			21,200	21,200	21,200	21,200	21,200	21,200	21,200	21,200	21,200	
<hr/>												
Totals												
Air fares		0	0	0	0	0	0	0	0	0	12,000	12,000
Air fares and other costs												
salary,per diem,local travel		0	0	0	0	0	0	0	0	0	216,240	216,240
Sum		0	0	0	0	0	0	0	0		228,240	228,240
Inflation		0	0	0	0	0	0	0	0	0	175,981	175,981
Contingency		0	0	0	0	0	0	0	0	0	40,422	40,422
TOTAL		0	0	0	0	0	0	0	0	0	444,643	444,643
total w/o contingency		0	0	0	0	0	0	0	0	0	404221	404,221

TABLE 18

Institutional Excellence Project
Phase II
Contractor Budget

Table 19

Expenditure Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
Project Academic Director												
one time costs		-	-	-	-	-	-	-	-	-	-	0
recurrent (\$17.2K*12)		-	-	-	-	-	-	-	48000	48000	48000	144,000
r&r		-	-	-	-	-	-	-	-	-	-	0
travel (\$4k*5) US-Pak		-	-	-	-	-	-	-	20000	20000	20000	60,000
Field Coordinator/Admin Officer (2)												
one time costs		47600	47600	0	47600	47600	0	47600	0	0	0	238,000
recurrent (\$14,500*12)		58000	177000	177000	177000	177000	177000	177000	177000	17700	12290	1,326,990
r&r		12000	12000	0	12000	12000	0	12000	-	24000	24000	108,000
travel (\$.135k*12) Isl-Khi		810	810	1620	1620	1620	1620	1620	1620	1620	1620	14,580
Short term Consultants EST (4)												
arrival/departure (\$4K*4)		8000	8000	8000	8000	0	0	0	-	-	-	32,000
monthly cost (\$17K*4)		34000	34000	34000	34000	0	0	0	-	-	-	136,000
Local Professional Staff												
Grade 12/5 (2)		5886	17657	17658	17658	17658	17658	17658	35315	35315	29430	211,891
Grade 11/5		4580	6870	6870	6870	6870	6870	6870	13740	13740	11450	84,730
Grade 11/5		4580	6870	6870	6870	6870	6870	6870	13740	13740	11450	84,730
secretary 7/7		2238	2238	2238	2238	2238	2238	2238	4475	4475	4475	29,088
Office Rent												
utilities		9300	13950	13950	13950	13950	13950	13950	27900	27900	23250	172,050
utilities		3537	5305	5305	5305	5305	5305	5305	10610	10610	8840	65,427
maintenance		1335	2000	2000	2000	2000	2000	2000	4000	4000	3340	24,675
office furniture etc		7500	0	0	3750	0	0	0	-	-	-	11,250
Professional Computer (3)												
printer 1,200		7500	0	0	0	7500	0	0	-	-	-	15,000
supplies		1800	0	0	0	1800	0	0	-	-	-	3,600
maintenance		670	1000	1000	1000	1000	1000	1000	2000	2000	1670	12,340
photocopier		268	400	400	400	400	400	400	800	800	670	4,937
supplies/maintenance		4500	0	0	0	4500	0	0	0	0	0	9,000
typewriter		170	250	250	250	250	250	250	500	500	420	3,090
supplies/maintenance		650	0	0	0	650	0	0	-	-	-	1,300
vehicles		68	100	100	100	100	100	100	200	200	170	1,237
maintenance		5125	0	0	5125	5125	0	5125	-	-	-	20,500
driver (1)		1860	2788	2788	2788	2788	2788	2788	5575	5575	4650	34,385
backstop (4*\$50k)+100%		1250	1250	1250	2500	2500	2500	2500	5000	5000	5000	29,750
backstop (4*\$50k)+100%		133335	200000	200000	200000	200000	200000	200000	400000	400000	333335	2,466,670
sum		356561	540087	481298	551023	519723	440548	505273	770475	635175	544060	5,344,220
Inflation (Fx 5% Lc 10%)												
contingency 10%		21394	66971	92554	146145	178331	187844	260429	470515	452659	447143	2,323,985
contingency 10%		37795	60706	57385	69717	69805	62839	76570	124099	108783	99120	766,821
TOTAL		415750	667764	631236	766884	767859	691231	842272	1365089	1196617	1090323	8,435,026

Institutional Excellence Project
Phase II
Personal Services Contractor

Table 20

Description	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
PSC											
- one time costs	-	-	-	-	-	-	-	-	95200	-	95,200
- recurrent (\$11.25K*12)	-	-	-	-	-	-	-	135000	135000	135000	405,000
- r&r	-	-	-	-	-	-	-	-	12000	-	12,000
sum	0	0	0	0	0	0	0	135000	242200	135000	512,200
Inflation (Fx 5% Lc 10%)	0	0	0	0	0	0	0	82442	172604	110952	365,998
Contingency 10%	0	0	0	0	0	0	0	21744	41480	24595	87,820
TOTAL	0	0	0	0	0	0	0	239186	456285	270547	966,018
total w/o contingency	0	0	0	0	0	0	0	217442	414804	245952	878,198

Institutional Excellence Project
Phase I and II
Faculty Exchange

Table 22

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of Visiting Professors												
Institutional Dev. A		2	2	2	2	2	2	2	2	0	0	16
Small Grants		2	2	2	3	3	2	2	2	2	2	22
Institutional Dev. B		0	2	2	2	2	2	2	2	0	0	14
Small Grants		2	2	2	3	2	2	2	2	2	2	21
Institutional Dev. C		0	2	2	2	2	2	2	2	2	0	16
Small Grants		2	2	2	3	3	2	2	2	2	2	22
Number of Professors		8	12	12	15	14	12	12	12	8	6	111
Air fares		4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4,000
Salary and related expenses		17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
Ave. duration of stay: Months												
Institutional Dev. A		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Institutional Dev. B		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Institutional Dev. C		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Small Grants		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
man months by category												
Institutional Dev. A		18	18	18	18	18	18	18	18	0	0	144
Small Grants		4	4	4	6	6	4	4	4	4	4	44
Institutional Dev. B		0	18	18	18	18	18	18	18	0	0	126
Small Grants		4	4	4	6	4	4	4	4	4	4	42
Institutional Dev. C		0	18	18	18	18	18	18	18	18	0	144
Small Grants		4	4	4	6	6	4	4	4	4	4	44
Total man months		30	66	66	72	70	66	66	66	30	12	544
Total w/o infl./contingency		542000	1170000	1170000	1284000	1246000	1170000	1170000	1170000	542000	228000	9,672,000
plus inflation		574520	1315080	1394991	1624549	1673537	1668875	1773046	1884498	928257	415385	13,252,738
plus contingency		631972	1446588	1534490	1787004	1840890	1835762	1950350	2072948	1021083	456924	\$14,578,011

Institutional Excellence Project
Phase I and II
Training: Long term

Table 23

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		1	3	4	4	4	4	4	4	4	2	34
Small Grants		1	2	2	2	2	1	0	0	0	0	10
Institutional Dev. B		0	2	4	4	4	4	4	4	3	1	30
Small Grants		1	2	2	2	2	1	0	0	0	0	10
Institutional Dev. C		1	3	4	4	4	4	4	3	1	0	28
Small Grants		0	1	2	2	2	2	1	0	0	0	10
Number of trainees		4	13	18	18	18	16	13	11	8	3	122
Air fares		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Per diem, tuition etc @ \$2,000 pm		24000	24000	24000	24000	24000	24000	24000	24000	24000	24000	
Total w/o infl./contingency		108000	351000	486000	486000	486000	432000	351000	297000	216000	81000	3,294,000
plus inflation		118200	391170	571968	604160	638321	599632	515015	460787	354446	140628	4,394,323
plus contingency		130020	430287	629165	664576	702153	659595	566517	506865	389890	154687	4,833,755

Institutional Excellence Project
Phase I and II
Training: Short term

Table 24

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		5	10	12	15	15	15	15	12	12	10	121
Small Grants		2	4	4	5	5	4	4	4	3	2	37
Institutional Dev. B		0	10	10	12	15	15	15	15	12	10	114
Small Grants		2	4	4	5	5	5	4	4	3	2	38
Institutional Dev. C		0	10	10	12	12	15	15	15	12	10	111
Small Grants		2	4	4	5	5	5	4	4	3	2	38
Number of trainees		11	42	44	54	57	59	57	54	45	36	459
Air fares		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Per diem and tuition etc for two months \$3,500 pm		7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	
Total w/o infl./contingency		110000	420000	440000	540000	570000	590000	570000	540000	450000	360000	4,590,000
plus inflation		117150	476595	532241	696646	784634	867026	894664	793549	754783	645593	6,562,879
plus contingency		128865	524255	585465	766310	863097	953728	984130	872904	830261	710152	7,219,167

Institutional Excellence Project
Phase I and II
Commodities

Table 25

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Institutional Dev. A		100000	200000	500000	500000	500000	250000	155000	100000	0	0	2,305,000
Small Grants		30000	50000	75000	100000	150000	100000	50000	50000	25000	25000	655,000
Institutional Dev. B		0	50000	100000	200000	500000	500000	250000	125000	60000	25000	1,810,000
Small Grants		30000	50000	75000	100000	200000	50000	50000	50000	50000	50000	705,000
Institutional Dev. C		0	50000	100000	200000	500000	500000	500000	250000	100000	50000	2,250,000
Small Grants		30000	50000	50000	75000	100000	200000	100000	50000	50000	50000	755,000
Sum		190000	450000	900000	1175000	1950000	1600000	1105000	625000	285000	200000	8,480,000
Inflation		9500	46125	141863	253220	538749	544153	449846	298410	157129	125779	2,564,773
Contingency		19950	49613	104186	142822	248875	214415	155485	92341	44213	32578	1,104,477
TOTAL		219450	545738	1146049	1571042	2737624	2358568	1710331	1015751	486341	358357	12,149,250
total w/o contingency		199500	496125	1041863	1428220	2488749	2144153	1554846	923410	442129	325779	11,044,773

Institutional Excellence Project
Phase I and II
Construction Budget

Table 26

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of undertakings												
Institutional Dev. A												
rehabilitation Labs.		0	3	2	3	3	2	2	2	0	0	17
renab. computer room mini		0	4	4	4	5	4	4	0	0	0	25
renab. computer room micro		0	8	10	10	10	10	10	5	0	0	63
Small Grants												
rehabilitation Labs.		0	0	1	2	2	2	1	0	0	0	8
renab. computer room mini		0	0	1	1	1	1	1	1	0	0	6
renab. computer room micro		0	5	5	5	5	5	5	5	5	5	45
Institutional Dev. B												
rehabilitation Labs.		0	1	2	2	2	1	0	0	0	0	8
renab. computer room mini		0	4	5	4	4	4	4	4	4	4	37
renab. computer room micro		0	8	10	10	10	10	10	5	0	0	63
Small Grants												
rehabilitation Labs.		0	1	1	1	1	1	1	1	1	1	9
renab. computer room mini		0	0	1	1	1	1	1	0	0	0	5
renab. computer room micro		0	2	5	5	5	5	5	5	5	5	42
Institutional Dev. C												
rehabilitation Labs.		0	1	2	2	2	2	1	0	0	0	10
renab. computer room mini		0	5	4	4	4	4	4	3	3	3	34
renab. computer room micro		0	7	10	10	10	10	10	10	0	0	67
Small Grants												
rehabilitation Labs.		0	1	1	1	1	1	1	1	0	0	7
renab. computer room mini		0	0	1	1	1	1	1	0	0	0	5
renab. computer room micro		0	2	5	5	5	5	5	0	0	0	27
* rehabilitation Labs.		0	7	9	11	11	9	6	4	1	1	59
* renab. computer room mini		0	13	16	13	16	15	15	8	7	7	112
* renab. computer room micro		0	32	45	45	45	45	45	30	10	10	307
Unit cost												
rehabilitation Labs.		8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	
renab. computer room mini		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	
renab. computer room micro		1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total w/o infl./contingency												
		0	242000	310750	316750	326750	300750	276750	164500	95500	95500	2,129,250
plus inflation		0	266805	359732	385012	417025	403034	389415	243041	148152	155559	2,767,775
plus contingency		0	293486	395705	423513	458728	443337	428357	267346	162967	171115	3,044,553

Institutional Excellence Project
Phase I and II
Research Projects Budget

Table 27

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Research project years												
Institutional Dev. A		1	2	4	4	4	3	2	1	1	0	22
Small Grants		0	1	2	3	3	2	1	0	0	0	12
Institutional Dev. B		0	1	2	3	3	3	2	1	1	0	16
Small Grants		0	0	1	2	2	1	0	0	0	0	6
Institutional Dev. C		0	0	1	2	3	3	3	2	1	1	16
Small Grants		0	0	0	1	2	2	1	0	0	1	6
Total project years		1	4	10	15	17	14	9	4	3	1	78
Average annual cost		103000	103000	103000	103000	103000	103000	103000	103000	103000	103000	103000
Total w/o Infl./contingency		103000	412000	1030000	1545000	1751000	1442000	927000	412000	309000	103000	8,034,000
plus inflation		110725	476375	1281642	2069996	2527386	2243504	1555421	745935	603983	217466	11,832,434
plus contingency		121798	524013	1409806	2276995	2780125	2467855	1710964	820529	664381	239212	13,015,677

Institutional Excellence Project
Phase I and II
Workshop, Seminars, Conferences

Table 2B

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of Events												
Institutional Dev. A												
Intern. Attendance		1	2	2	2	3	2	2	2	2	0	18
Intern. Sponser												0
Domestic Sponser		2	5	5	5	5	5	5	5	5	3	45
Small Grants												
Intern. Attendance		1	1	1	1	1	1	1	1	0	0	8
Intern. Sponser												0
Domestic Sponser		1	1	1	1	1	1	1	1	1	0	9
Institutional Dev. B												
Intern. Attendance		1	2	2	2	2	2	2	2	2	2	19
Intern. Sponser						1	1					2
Domestic Sponser		2	5	5	5	5	5	5	5	5	2	44
Small Grants												
Intern. Attendance		1	1	1	1	1	1	1	1	1	0	9
Intern. Sponser												0
Domestic Sponser		1	1	1	1	1	1	1	1	0	0	8
Institutional Dev. C												
Intern. Attendance		0	2	2	2	2	2	2	2	2	0	16
Intern. Sponser												0
Domestic Sponser		1	3	3	3	3	3	3	5	5	2	31
Small Grants												
Intern. Attendance		0	1	1	1	1	1	1	1	1	1	9
Intern. Sponser												0
Domestic Sponser		0	1	1	1	1	1	1	0	0	0	6
Summary												
No. of Intern. Attendance		4	9	9	9	10	9	9	9	8	3	79
No. of Intern. Sponser		0	0	0	0	1	1	0	0	0	0	2
No. of Domestic Sponser		7	16	16	16	16	16	16	17	16	7	143
Costs												
Cost per Intern. Attendance		30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30,000
Cost per Intern. Sponser		80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000
Cost per Domestic Sponser		10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10,000
Totals												
Total w/o infl./contingency		190000	430000	430000	430000	540000	510000	430000	440000	400000	180000	3,980,000
plus inflation		203300	483320	512689	544047	725289	727458	651632	708700	685061	291498	5,532,994
plus contingency		223630	531652	563958	598451	797818	800204	716795	779570	753567	320648	6,086,294

C. K. M. W.

Institutional Excellence Project
Phase I and II
Evaluation Budget

Table 29

Expense Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Totals
Number of persons	-	1	-	3	-	3	-	-	-	-	3	10
Number of weeks	-	2	-	3	-	4	-	-	-	-	3	12
Air fares and other costs		4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	
salary,per diem,local		21,200	21,200	21,200	21,200	21,200	21,200	21,200	21,200	21,200	21,200	
travel												
<hr/>												
Totals												
Air fares	0	4,000	0	12,000	0	12,000	0	0	0	0	12,000	40,000
Air fares and other costs												
salary,per diem,local	0	42,400	0	190,800	0	254,400	0	0	0	0	216,240	703,840
travel												
Sum	0	46,400	0	202,800	0	266,400	0	0	0	0	228,240	743,840
Inflation	0	5,642	0	51,431	0	106,756	0	0	0	0	175,981	339,809
Contingency	0	5,204	0	25,423	0	37,316	0	0	0	0	40,422	108,365
TOTAL	0	57,246	0	279,654	0	410,471	0	0	0	0	444,643	1,192,014

Institutional Excellence Project
Phase I and II
Contractor Budget

Table 30

Line Item Category	FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
Project Academic Director												
one time costs		95200	-	-	95200	-	-	-	-	-	-	190,400
recurrent (\$17.2K*12)		137600	206000	206000	206000	206000	48000	48000	48000	48000	48000	1,201,600
r&r		12000	-	-	12000	-	-	-	-	-	-	24,000
travel (\$4k*5) US-Pak		20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	200,000
Field Coordinator/Admin Officer (2)												
one time costs		95200	95200	-	95200	95200	-	95200	-	-	-	476,000
recurrent (\$14,500*12)		116000	354000	354000	354000	354000	354000	354000	177000	177000	12290	2,446,990
r&r		24000	24000	-	24000	24000	-	24000	-	24000	24000	168,000
travel (\$.135k*12) Isl-Khi		1620	1620	3240	3240	3240	3240	3240	1620	1620	1620	24,300
Short term Consultants EST (4)												
arrival/departure (\$4K*4)		16000	16000	16000	16000	-	-	-	-	-	-	64,000
monthly cost (\$17K*4)		68000	68000	68000	68000	-	-	-	-	-	-	272,000
Local Professional Staff												
Grade 12/5 (2)		11772	35315	35315	35315	35315	35315	35315	35315	35315	29430	323,722
Grade 11/5		9160	13740	13740	13740	13740	13740	13740	13740	13740	11450	130,530
Grade 11/5		9160	13740	13740	13740	13740	13740	13740	13740	13740	11450	130,530
secretary 7/7		4475	4475	4475	4475	4475	4475	4475	4475	4475	4475	44,750
Office Rent												
utilities		18600	27900	27900	27900	27900	27900	27900	27900	27900	23250	265,050
maintenance		7075	10610	10610	10610	10610	10610	10610	10610	10610	8840	100,794
office furniture etc		2670	4000	4000	4000	4000	4000	4000	4000	4000	3340	38,010
		15000	-	-	7500	-	-	-	-	-	-	22,500
Professional Computer (3)												
printer 1,200		15000	-	-	-	15000	-	-	-	-	-	30,000
supplies		3600	-	-	-	3600	-	-	-	-	-	7,200
maintenance		1340	2000	2000	2000	2000	2000	2000	2000	2000	1670	19,010
photocopier		535	800	800	800	800	800	800	800	800	670	7,605
supplies/maintenance		9000	-	-	-	9000	-	-	-	-	-	18,000
typewriter		340	500	500	500	500	500	500	500	500	420	4,760
supplies/maintenance		1300	-	-	-	1300	-	-	-	-	-	2,600
vehicles		175	200	200	200	200	200	200	200	200	170	1,905
vehicles maintenance		10250	-	-	10250	10250	-	10250	-	-	-	41,000
driver (1)		3720	5575	5575	5575	5575	5575	5575	5575	5575	4850	52,970
backstop (4*\$50K)+100%		2500	2500	2500	5000	5000	5000	5000	5000	5000	5000	42,500
		266670	400000	400000	400000	400000	400000	400000	400000	400000	333375	3,600,005
sum		977922	1306174	1188595	1435245	1265445	949095	1078545	770475	635175	544060	10,150,731
Inflation (Fx 5% Lc 10%)		58675	161966	228567	380663	434209	404687	555908	470515	452659	447143	3,594,988
Contingency 10%		103660	146814	141716	181591	169965	135378	163445	124099	108783	99120	1,574,572
TOTAL		1140257	1614954	1558878	1997499	1869619	1489156	1797898	1365089	1196617	1090323	15,120,290

Institutional Excellence Project
 Personal Services Contractor Cost

Table 31

Description	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
PSC											
one time costs	95200	-	-	95200	-	-	95200	-	95200	-	380,800
recurrent (\$11.25K*12)	135000	135000	135000	135000	135000	135000	135000	135000	135000	135000	1,350,000
r&r	12000	-	-	12000	-	-	12000	-	12000	-	48,000
sum	242200	135000	135000	242200	135000	135000	242200	135000	242200	135000	1,778,800
Inflation (Fx 5% Lc 10%)	14532	16740	25961	64237	46322	57562	124836	82442	172604	110952	716,188
Contingency 10%	25673	15174	16096	30644	18132	19256	36704	21744	41480	24595	249,499
TOTAL	282405	166914	177057	337081	199454	211819	403739	239186	456285	270547	2,744,487

Institutional Excellence Project (Phase I)
 Summary of costs by year of expenditure
 (\$ in 000s)

Table 12

Expense Category/FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
TECHNICAL ASSISTANCE	340	1,170	320	400	400	320	390	0	0	0	3,240
fx	334	976	312	342	342	312	312	0	0	0	3,038
lc	108	204	78	86	86	78	78	0	0	0	202
TRAINING	218	771	511	389	362	325	244	0	0	0	2,520
Long term	108	351	351	189	162	135	54	0	0	0	1,350
fx	12	312	312	168	144	120	48	0	0	0	1,304
lc	96	39	39	21	18	15	6	0	0	0	146
Short term	110	420	160	200	200	190	190	0	0	0	1,400
fx	77	294	112	140	140	133	133	0	0	0	1,069
lc	33	126	48	60	60	57	57	0	0	0	431
COMMODITIES	190	450	575	600	650	350	205	0	0	0	3,000
fx	190	450	575	600	650	350	205	0	0	0	3,000
lc	0	0	0	0	0	0	0	0	0	0	0
CONSTRUCTION	0	242	100	116	126	108	100	0	0	0	782
fx	0	242	100	116	126	108	100	0	0	0	782
lc	0	0	0	0	0	0	0	0	0	0	0
OTHER COSTS	293	888	768	1,074	981	931	459	0	0	0	5,785
Research Projects	103	412	618	721	721	515	309	0	0	0	3,709
fx	52	206	309	361	361	258	155	0	0	0	1,742
lc	52	206	309	361	361	258	155	0	0	0	1,742
WShops, Seminars etc	190	430	150	150	260	150	150	0	0	0	1,430
fx	114	344	120	120	208	120	120	0	0	0	1,144
lc	76	86	30	30	52	30	30	0	0	0	286
Evaluation	0	46	0	203	0	266	0	0	0	0	475
fx	0	38	0	172	0	229	0	0	0	0	439
lc	0	8	0	31	0	37	0	0	0	0	76
CONTRACTOR	621	766	707	884	746	509	577	0	0	0	4,000
fx	497	613	566	707	597	407	459	0	0	0	3,286
lc	124	153	141	177	149	102	115	0	0	0	714
PSC	242	135	135	242	135	135	242	0	0	0	1,366
fx	194	108	108	194	108	108	194	0	0	0	1,114
lc	48	27	27	48	27	27	48	0	0	0	252
TOTAL	2,107	4,422	3,187	3,737	3,429	2,748	2,214	0	0	0	21,754
fx	1,569	3,547	2,514	2,920	2,576	2,145	1,725	0	0	0	17,472
lc	538	879	672	817	752	604	489	0	0	0	4,282

Institutional Excellence Project (Phase II)
 Summary of costs by year of expenditure
 (\$ in 000s)

Table 33

Expense Category/FY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
TECHNICAL ASSISTANCE	0	0	780	856	818	780	780	1,170	542	228	5,954
fx	0	0	624	685	654	624	624	976	474	182	4,765
lc	0	0	156	171	164	156	156	234	108	46	1,170
TRAINING	0	0	415	637	694	697	677	837	666	441	5,064
_Long term	0	0	135	297	324	297	297	297	216	81	1,944
fx	0	0	120	264	288	264	264	264	192	72	1,728
lc	0	0	15	33	36	33	33	33	24	9	216
Short term	0	0	280	340	370	400	380	540	450	360	3,120
fx	0	0	196	238	259	280	266	378	315	252	2,184
lc	0	0	84	102	111	120	114	162	135	108	936
COMMODITIES	0	0	325	575	1,300	1,250	900	625	285	200	5,460
fx	0	0	325	575	1,300	1,250	900	625	285	200	5,460
lc	0	0	0	0	0	0	0	0	0	0	0
CONSTRUCTION	0	0	211	201	201	193	177	165	96	96	1,376
fx	0	0	211	201	201	193	177	165	96	96	1,376
lc	0	0	0	0	0	0	0	0	0	0	0
OTHER COSTS	0	0	692	1,104	1,310	1,287	898	852	709	491	7,347
Research Projects	0	0	412	824	1,030	927	618	412	309	103	4,635
fx	0	0	206	412	515	464	309	206	155	52	2,318
lc	0	0	206	412	515	464	309	206	155	52	2,318
WShops.Seminars etc	0	0	280	280	280	360	280	440	400	160	2,480
fx	0	0	224	224	224	288	224	352	320	128	1,984
lc	0	0	56	56	56	72	56	88	80	32	496
Evaluation	0	0	0	0	0	0	0	0	0	228	228
fx	0	0	0	0	0	0	0	0	0	195	195
lc	0	0	0	0	0	0	0	0	0	34	34
CONTRACTOR	357	540	481	551	520	441	505	770	635	544	5,044
fx	285	472	385	441	415	352	404	616	508	435	4,277
lc	71	108	96	110	104	88	101	154	127	109	1,047
PSC	0	0	0	0	0	0	0	135	242	133	510
fx	0	0	0	0	0	0	0	108	194	108	410
lc	0	0	0	0	0	0	0	27	48	25	100
TOTAL	357	540	2,904	3,924	4,942	4,647	3,937	4,554	3,175	2,135	31,014
fx	285	472	2,291	3,039	3,957	3,714	3,168	3,650	2,498	1,719	24,677
lc	71	108	613	884	986	933	769	904	677	416	6,337

A. Technical Analysis

1. Institutional Development Component

The Institutional Excellence Project provides resources to assist selected departments of higher education in Pakistan to improve and maintain standards of professional quality. IEP addresses problems which are weakening these units or reducing their effectiveness as important sources of ideas and leadership in the area of science and technology. The institutional needs the project will seek to meet are far-ranging and affect all elements of each department: qualified faculty and staff, adequate physical conditions for learning including updated library materials and equipment, better prepared students, resources to conduct research that is integrated with instructional programs and targeted on national development problems, and effective program and personnel policies.

a. Faculty

Research on program quality has looked into the nature of an institution's faculty, their training, length of service, adequacy of compensation, teaching load, student-faculty ratio, research productivity, how often they have been invited to give lectures outside the institution, honors, awards, even overseas experience. Each of these indicators can be further refined by determining the repute of the university from which they graduated, the journals or firms publishing their research output, the granting of honors and awards, etc. Generally, however, it is assumed that institutions with a fair proportion of their faculty and staff holding graduate degrees, preferably Ph.Ds, undertaking and publishing research findings regularly, well compensated, with a relatively low student-faculty ratio, would be a necessary component to achieve institutional excellence.

b. Facilities

It is obvious learning cannot take place, much less excellence achieved, without adequate, if not conducive, physical facilities. Laboratories must be equipped, maintained and staffed. Libraries should hold relevant books, journals, documents, archives and possess the ability to access other libraries with complementary holdings. Classrooms should be spacious, clean, well-lighted, heated and ventilated, and equipped for presentations. In order to successfully conduct instruction and research programs, equipment must be available, and appropriate to the task. Support equipment, like computers, should also be available.

c. Students

Research has focused on the nature of an institution's student body, their average scores on standard entrance examinations, their ranking in their graduating classes (from initial degree programs), their English language capability, their honors and awards, and the current income or employment of their graduates.

d. Research

Indicators of excellence include the number, variety, and depth of research programs, administrative incentives for undertaking research, the integration of research into instructional programs, awards and honors achieved by specific research studies, the variety of sources of funding for research, even research undertaken in foreign countries. Equally important are the linkages developed between the research results and the major development problems in the country.

e. Program and Personnel Policies

Institutions which have policies that encourage and support linkages with national and international professors, scientists, technicians and researchers are more likely to enrich their academic and research programs. Also, rewards for faculty to undertake and complete research studies are important to overall success of a graduate department of higher education. It is critical that university and department policies promote standards of excellence and discourage anything else.

f. In General

Each of the nine centers will develop an Institutional Development Plan in terms of the above-mentioned dimensions. Some institutions might emphasize the quality of their student body and require resources to improve the preparation of their students by strengthening English language or computer training programs. Others might emphasize research, acquiring the materials needed to successfully conduct it or inviting short-term technical assistance to conferences for the dissemination of research results. Still others might develop Institutional Plans requiring all of IEP's resources; technical assistance, training, commodities, and renovation of existing physical infrastructure. With the collaboration of U.S. university departments, the nine participating institutions will define their needs and implement the resultant Plan to achieve excellence. This process of determining areas of strengths and weakness, developing a plan of action, implementing, monitoring and evaluating it is the core of IEP's model of excellence in higher education.

The nine institutions selected for participation under the Institutional Development Component were chosen for their relevance to the socio-economic goals of Pakistan, their congruence with USAID Mission

objectives and the expressed interests of the GOP. Further, these institutions have already demonstrated a desire for attaining excellence in their ability to maintain a standard of performance during a period of general decline in Pakistan's system of higher education. Generally, these institutions reflect the importance of certain disciplines to Pakistan's developing economy -- agriculture, engineering, economics, physics, biotechnology, and geology. IEP expects these nine institutions to provide the evolution of new knowledge as well as the application of existing technology that will impact on Pakistan's development problems.

The nine institutions selected for participation in the Institutional Development component are as follows:

- (1) COE in Geology, University of Peshawar, Peshawar.
- (2) COE in Advanced Molecular Biology, University of Punjab, Lahore.
- (3) Department of Electrical Engineering, University of Engineering and Technology, Lahore.
- (4) Institute of National Capability (AERC), University of Karachi, Karachi
- (5) Institute of Marine Biology, University of Karachi, Karachi.
- (6) COE in Solid State Physics, University of Punjab, Lahore.
- (7) COAS in Applied Genetics and Saline Agriculture, University of Agriculture, Faisalabad.
- (8) Department of Structural Engineering, University of Engineering and Technology, Lahore.
- (9) COE in Minerology, University of Baluchistan, Quetta.

Each of these institutions has been visited and profiles developed for use as baseline information on their status at the start of the project.

2. Small Grants Component

The Small Grants Component is not limited to university departments, COE and COAS. Laboratories, research centers and private industries will be

eligible for support. Funds under this component are primarily meant to support research in science and technology. Criteria for approval of Small Grants Component include the following:

- a. Scientific Merit: The scope of the problem to be addressed, quality of the research design, appropriateness of the proposed methodology, nature of required instruments are among the factors which should be assessed.
- b. Potential Impact: This could include the potential impact of research results on national or provincial development priorities of the GOP and USAID. Part of the criteria could also discuss how the strategy and methodology proposed compare with other existing research approaches and how the outcome contributes to the academic and research programs of the institution.
- c. Financial Feasibility: This could include a determination of whether the resources are to be used efficiently and if the approach is cost-effective.
- d. Interdisciplinary Approach: Research proposals will be encouraged to adopt an interdisciplinary research approach. The involvement of scientific professionals in complementary or related fields in the same university or other universities throughout Pakistan, and a university in U.S., could be part of criteria.
- e. Contributions of the Proposing Institution: The criteria could include a demonstration of the support and commitment of the institution for the research activity, whether in-kind or additional resources provided for the activity.
- f. Capability of the Principal Investigator: Demonstration of the experience, training and capability of the Principal Investigator to conduct the proposed research activity would be another of the criteria. This might include a discussion of other key personnel, or a plan for the use and training of advanced students in the activity.

The Small Grants components will lend itself to additional joint U.S./Pakistani scientific cooperation. Specifically, the awards for the Small Grants component will be made in three scientific disciplines per annum. A joint U.S./Pakistani scientific committee will establish these disciplines and research priorities, therein. Proposals will be evaluated by a committee of appropriate American and Pakistani scientists from the public and private sectors under the direction of the UGC in collaboration with the MOE and the Ministry of Science and Technology. The project cooperator will be responsible for identification of the American and Pakistani scientists.

An important element of the Small Grants Component will be peer review of all requests for funds. Peer review assists the improvement of research and instructional standards in many ways. It fosters the creation and use of criteria which reward clarity and technical competence, and moves the basis of selection to more objective grounds. It also provides opportunities for interaction between proposers and reviewers, thus spreading the use of improved standards.

IEP builds on the growing use, in Pakistan, of peer review mechanisms. Peer review will be used to link funding decisions in the Small Grants Components to national development needs by judging the merit of proposals on their technical quality. Ultimately, the academic community will become more attuned to national needs and more capable of responding to them through the application and evolution of relevant technology.

3. Conclusion: Excellence in Higher Education

The evaluation of excellence in higher education is comprised of objective measures and subjective judgment. While there may not always be agreement on the definition of excellence, there appears, however, to be agreement on the elements necessary to enable excellence to be achieved. A program of high quality would have a well-trained faculty administering it, the facilities necessary for its implementation, the institutional structure providing positive guidance and incentives, and a student body well prepared to receive instruction and participate in research. It is, therefore, evident that IEP incorporates many elements that can be measured to determine the level of quality in the participating institutions.

B. Financial Analysis

1. General

The Institutional Excellence Project will support the Government of Pakistan's efforts to strengthen, consolidate and improve the system of higher education in Pakistan through assistance to select Centers of Excellence, Centers of Advanced Research and university departments.

In Pakistan, financial allocations to the education sector have been traditionally low, in fact among the lowest in the world (see Annex 6C - Economic Analysis). The GOP expenditure on education has persistently been less than two percent of the GNP and less than ten percent of the total government expenditure. The amount spent on education from the development budget shows a declining trend and today it stands at slightly less than 5 percent (Table-1).

Table 1
Government Expenditure on Education
(Rs. Millions)

	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>	<u>1985-86</u>	<u>1986-87</u>	<u>Allocations</u> <u>1987-88</u>
	(As a % of GNP (mp)**)					
Total Expenditure on Education	1.56	1.67	1.72	1.80	1.94	2.4
	(As a % of total government expenditures)					
Total Expenditure on Education	7.42	7.50	7.61	7.81	7.95	9.37
	(As a % of government development expenditure)					
Development Expenditure on Education	7.03	6.44	5.93	6.49	4.89	9.00

The total allocation for the year 1987-88 for education as a percent of GNP is estimated at 2.4 percent. Total expenditure on education as a percentage of total government expenditures is estimated to be 9.37 percent for 1987-88, and development expenditure on education is projected at nine percent of the total government development

** mp refers to market price

expenditure. These are estimated and the actual expenditures against these allocations are not yet available.

The total expenditure against the allocation for the Education Sector under the Sixth Five Plan is estimated at \$707 million, or approximately \$141.4 million per year. Of the total allocated under the Plan, the estimated expenditure for universities is \$73 million or approximately \$14.6 million per annum.

The Seventh Five Year Plan proposes to allocate \$1,194 million to the education sector. The average annual allocation amounts to \$239 million. The proposed allocation for universities totals \$95 million and averages \$19 million annually.

Historically, non-developmental or recurrent expenditures have ranged between 70 percent and 81 percent (1987) of the total budget allocation for education. Development expenditure for the ten year period has ranged between 30 percent and 17 percent (1987). A comparison of development and non-development expenditure over the past five years demonstrate that development budget allocations have decreased to about half their 1982 levels (Table-2).

Table 2

	Development Expend (million \$)	Non-Development Expend (million \$)	Total Expend (million \$)	Development Expend %	Non-Development Expend %
1977-78	86.4	247.0	333.4	0.26	0.74
1978-79	104.3	274.7	379.0	0.28	0.74
1979-80	92.3	269.3	361.6	0.26	0.74
1980-81	97.7	266.1	363.8	0.27	0.73
1981-82	121.5	281.9	403.4	0.30	0.70
1982-83	102.9	240.3	343.2	0.30	0.70
1983-84	78.4	266.2	342.0	0.23	0.78
1984-85	71.8	269.1	342.6	0.21	0.79
1985-86	88.5	305.2	360.4	0.25	0.85
1986-87	67.7	318.5	394.6	0.17	0.81
Growth 1st 5 years	7.07%	2.68%	3.89%		
Growth 2nd 5 years	- 8.03%	5.80%	2.83%		
Av. Annual Growth	- 2.40%	2.57%	1.70%		

Over the last ten years, the portion allocated to primary education was approximately 35 percent and university education approximately ten percent. These percentages have been more or less constant (Table 3).

Table 3

	Primary Expend (million \$)	University Expend (million \$)	Primary Expend %	University Expend %
1977-78	83.2	26.1	0.25	0.08
1978-79	127.6	31.7	0.34	0.08
1979-80	139.7	37.1	0.39	0.10
1980-81	123.7	36.2	0.34	0.10
1981-82	131.1	44.0	0.32	0.11
1982-83	111.2	35.3	0.32	0.10
1983-84	116.2	32.1	0.34	0.09
1984-85	125.7	35.5	0.37	0.10
1985-86	129.9	34.2	0.36	0.09
1986-87	139.4	42.2	0.35	0.11
Growth 1st 5 year	9.52%	11.05%		
Growth 2nd 5 year	4.62%	3.62%		
Average Annual Growth	5.30%	4.93%		

The real annual growth in the budget for education has been approximately 1.7 percent; the increase in the first five years (1977-1982) represents approximately 3.9 percent and in the second five years (1983-1987) 2.8 percent. The real annual growth in the university budget has been approximately 5 percent from 1978-1987, and from 1978-82 and 1983-87 approximately 11 percent and 3.6 percent respectively. The increase in the allocation for college and technical education has lagged behind. The amount of dollars spent per student per annum by level of education is presented in Table 4.

Table 4
Real Cost Per Student

	Primary I-V	Secondary* VI-X	College Art/Science	University	Technical**
1977-78	16.59	25.57	307.33	633.62	620.57
1978-79	24.87	39.56	154.37	820.89	855.22
1979-80	26.79	37.55	133.33	887.39	708.27
1980-81	22.60	36.91	124.75	847.32	851.00
1981-82	22.83	34.13	125.65	925.33	1040.51
1982-83	18.00	31.41	114.67	721.80	953.84
1983-84	16.94	30.58	100.94	635.91	892.69
1984-85	17.01	35.78	106.23	656.74	415.53
1985-86	16.79	34.32	96.28	570.85	508.26
1986-87	17.25	33.15	90.74	654.39	642.96
Growth 1st 5 year	6.59%	5.95%	-16.38%	7.87%	10.89%
Growth 2nd 5 year	-0.85%	1.08%	-4.57%	-1.94%	-7.59%
AV. Annual Growth	0.39%	2.63%	-11.48%	0.32%	0.36%

Secondary education includes secondary vocational.

Technical education includes professional colleges and teacher education.

In real terms, costs per student at the primary level and at the university level have risen at an annual rate of approximately 0.39 percent and 0.32 percent respectively. Today the cost per student at the primary level is approximately \$32 per annum; the annual cost for a university student is about \$1,224. (These costs include both development and recurrent expenditures.) Rising recurring costs of educational institutions are aggravated by the very low tuition rates; as a result, subsidies are high. Data on the number of institutions, total enrollment, number of teachers and student teacher ratios are available at the end of this Section in Tables 9-13.

The objectives of the Seventh Plan for education and training sector are to (i) broaden the resource base for education; (ii) universalize access to primary education; (iii) substantially improve technical and vocational training facilities; and (iv) improve the quality of education at all levels and in particular, that of university education.

To broaden the resource base the government has organized an 'iqra' fund. An iqra surcharge has been levied on all imports since 1985. The GOP intends to levy this surcharge on other economic activities to generate additional funds for education. To attract more funds, the GOP also intends to treat future donations to the iqra fund and other education endowments as a tax write-off.

To universalize access to primary education, the GOP intends to make it obligatory for all new housing schemes to provide primary and secondary schools. The cost of these facilities will include the cost of land and development charges which will be recovered from the land holders. Ultimately the GOP intends to make school facilities available such that all school-age children live within a radius of 1.5 kilometer of a primary school.

To improve efficiency and educational supervision, the government proposes to begin involving local bodies, district education authorities and the local community in the day to day management of schools. To increase the share of students attending technical and vocational institutions to over 33 percent, the GOP intends to establish 42 polytechnics, four commercial colleges, and 50 vocational training centers, two elementary teachers training colleges, and one agriculture extension institute. The private sector will be encouraged to set up technical schools, and will be provided with tax exemption on donations and income tax relief. Credit facilities will also be made available to the private sector.

2. Universities

There are currently 20 public and two private universities in Pakistan. The data compiled by the University Grants Commission in "Handbook on the

Universities of Pakistan" show a total budget of approximately \$114 million, broken up into recurring costs of approximately \$84 million and development costs of approximately \$30 million. On average, 85 percent of the budget is from the federal government and 15 percent is raised by the universities from tuition, examination fees, library fees, sports activities, etc. Among the different universities, the percentage of recurring, development, federal, and self-generated funds varies from year to the year. The details are summarised in Table 5.

To improve the financial status of university education, the GOP proposes to eliminate the subsidy by raising fees gradually from the present one percent of recurring expenditure to ten percent. The GOP also intends to utilize 20-25 percent of the funds collected from the iqra fund, encourage endowment funds, and make donations to these funds tax free without limit. The GOP intends to allow universities to acquire industrial and agricultural assets which can generate income as well as employment and training opportunities for students. The GOP further intends to allow the universities to negotiate foreign assistance and create private chairs. The policy package for private universities will include tax free donations to endowment funds, access to foreign assistance and support from NGOs funds.

The GOP hopes to streamline the administration of the universities. The dual control by the federal and provincial governments is now viewed as damaging to university education and the GOP is considering transferring responsibility of university education to the provinces. The admissions policies in universities and colleges is also being assessed to allow for future, highly selective admissions based on merit. The research capabilities of the universities are likely to be enhanced by the provision of improved physical facilities, staff development, teacher exchange programs, linkages with foreign universities and encouragement of contract research. The GOP has also explicitly stated that no new research institute will be established in the public sector outside the universities. The universities will be the focal point of research as well as education in science and technology. However, the Seventh Five Year Plan does provide for an institute of science and technology in the private sector.

3. Technical and Vocational Education

Presently there are eight engineering education institutions in Pakistan. The total intake capacity presently is 4000. The government expects to increase intake during the Seventh Five Year Plan to 5000. There are 30 polytechnic institutes and nine colleges of technology including eight polytechnics for women. The total annual intake capacity of these institutions is 9000. The Seventh Five Year Plan anticipates increasing this intake capacity to almost 19,000, partly by decreasing

Table- 5

Institutional Excellence Project
Cost analysis of Universities in Pakistan

Name of University	Budget				Rs. in 000s				
	Recurring		Development		Total 1985-86	%	Total 1986-87	%	
	1985-86	1986-87	1985-86	1986-87					
1 Allama Iqbal	0	0	0	0	0		0		
own	n.a.	n.a.	n.a.	n.a.	0		0		
fed. govt.	n.a.	n.a.	n.a.	n.a.	0		0		
2 AJ&Kashmir	19,236	27,100	13,500	18,421	32,736	100.00%	45,521	100.00%	
own	2,436	2,600	13,500	18,421	15,936	48.68%	21,021	46.18%	
fed. govt.	16,800	24,500			16,800	51.32%	24,500	53.82%	
3 Bahauddin Zakariya	27,092	32,759	14,000	16,531	41,092	100.00%	49,290	100.00%	
own	8,092	9,689			8,092	19.69%	9,689	19.66%	
fed. govt.	19,000	23,070	14,000	16,531	33,000	80.31%	39,601	80.34%	
4 Baluchistan	23,384	27,329	12,508	12,500	35,892	100.00%	39,829	100.00%	
own	2,300	2,500			2,300	6.41%	2,500	6.28%	
fed. govt.	21,084	24,829	12,508	12,500	33,592	93.59%	37,329	93.72%	
5 U of Agriculture	688,970	619,810	126,790	145,660	815,760	100.00%	965,470	100.00%	
own	98,970	89,510	71,640	65,710	170,610	20.91%	155,220	16.08%	
fed. govt.	590,000	730,300	55,150	79,950	645,150	79.09%	810,250	83.92%	
6 Gomal	24,077	28,306	15,000	15,000	39,077	100.00%	43,306	100.00%	
own	1,500	2,306			1,500	3.84%	2,306	5.32%	
fed. govt.	22,577	26,000	15,000	15,000	37,577	96.16%	41,000	94.68%	
7 Int. Islamic	35,321	42,692	7,400	16,748	42,721	100.00%	59,440	100.00%	
own	1,286	1,492	7,400	16,748	8,686	20.33%	18,240	30.69%	
fed. govt.	34,035	41,200			34,035	79.67%	41,200	69.31%	
8 Islamia of Bwp.	14,539	17,616	15,050	1,500	29,589	100.00%	19,116	100.00%	
own	1,100	1,200			1,100	3.72%	1,200	6.28%	
fed. govt.	13,439	16,416	15,050	1,500	28,489	96.28%	17,916	93.72%	
9 Karachi:	60,220	65,286	10,000	77,330	70,220	100.00%	142,616	100.00%	
own	12,000	12,000			12,000	17.09%	25,585	17.94%	
fed. govt.	48,220	53,286	10,000	65,745	58,220	82.91%	117,031	82.06%	
10 Eng. Tech. Lahore	54,470	65,300	11,364	14,616	65,834	100.00%	79,716	100.00%	
own	5,529	4,500			5,529	8.40%	4,500	5.63%	
fed. govt.	48,941	60,800	11,364	14,616	60,305	91.60%	75,216	94.37%	
11 Menran	28,473	32,761	20,000	14,000	48,473	100.00%	46,761	100.00%	
own	2,301	2,761			2,301	4.75%	2,761	6.33%	
fed. govt.	26,172	29,900	20,000	14,000	46,172	95.25%	43,900	93.67%	
12 NED	27,999	35,557	14,397	0	42,396	100.00%	35,557	100.00%	
own	1,427	1,600			1,427	3.37%	1,600	4.50%	
fed. govt.	26,572	33,957	14,397		40,969	96.63%	33,957	95.50%	

Table-3 (contd.)

Name of University	Budget						%	Total 1986-87	%
	Recurring		Development		Total 1985-86	%			
	1985-86	1986-87	1985-86	1986-87					
13 NWFP Ag.	n.a.	23,973	n.a.	36,204	n.a.		60,177	100.00%	
own	n.a.	1,919	n.a.		n.a.		1,919	3.19%	
fed. govt.	n.a.	22,054	n.a.	36,204	n.a.		58,258	96.81%	
14 NWFP Eng. Tech.	21,398	23,845	5,118	2,373	26,516	100.00%	28,418	100.00%	
own	2,506	2,790			2,506	9.45%	2,790	9.82%	
fed. govt.	18,892	23,055	5,118	2,373	24,010	90.55%	23,628	90.18%	
15 Punjab	110,836	83,573	23,000	14,449	135,836	100.00%	98,022	100.00%	
own	40,766	28,005	23,000		65,766	48.42%	28,005	28.57%	
fed. govt.	70,070	53,568		14,449	70,070	51.58%	70,017	71.43%	
16 Peshawar	66,800	82,400	13,700	13,186	80,500	100.00%	97,386	100.00%	
own	14,000	14,800			14,000	17.39%	14,800	15.17%	
fed. govt.	52,800	67,600	13,700	13,186	66,500	82.61%	82,786	84.83%	
17 Quaid i Azam	33,045	40,039	9,000	130,800	44,045	100.00%	170,839	100.00%	
own	3,045	3,870			3,045	11.45%	3,870	2.27%	
fed. govt.	30,000	36,169	9,000	130,800	39,000	88.55%	166,969	97.73%	
18 Sind	72,923	83,746	11,309	8,830	84,232	100.00%	94,396	100.00%	
own	12,378	14,696			12,378	14.70%	14,696	15.54%	
fed. govt.	60,545	71,050	11,309	8,830	71,854	85.30%	79,900	84.46%	
19 Sind Ag.	31,477	40,465	9,312	22,103	40,769	100.00%	62,370	100.00%	
own	3,477	3,712			3,477	8.52%	3,712	5.93%	
fed. govt.	28,000	36,753	9,312	22,103	37,292	91.48%	58,658	94.07%	
20 Shah A. Latif	9,117	23,000	4,100	4,186	13,217	100.00%	27,186	100.00%	
own	814	1,000	4,100	4,186	4,914	37.18%	5,186	19.08%	
fed. govt.	8,303	22,000			8,303	62.82%	22,000	80.92%	
TOTAL IN PAK. RUPEE	1,351,377	1,399,537	337,348	366,639	1,688,923	100.00%	2,166,216	100.00%	
own	215,927	201,150	121,640	118,630	337,567	19.99%	319,300	14.76%	
fed. govt.	1,135,450	1,198,407	215,908	448,009	1,351,358	80.01%	1,846,416	85.24%	
TOTAL IN US DOLLARS	71,123	84,197	17,766	29,824	\$88,891	100.00%	\$114,011	100.00%	
	11,365	10,387	6,402	6,245	17,767	19.99%	16,332	13.76%	
	59,761	73,600	11,364	23,579	71,124	80.01%	97,180	85.24%	

the duration of the diploma course from three years to two years. In addition, 31 new polytechnics including 12 in the private sector are to be established during the Seventh Five Year Plan. At present there are 150 vocational institutes in the country with an intake capacity of about 12,500. The government intends to set up 50 new such institutes, ten for men and 40 for women. Commercial education is offered in 13 commerce colleges and 104 commercial training institutes in the public sector. A fairly large number of commercial training institutes exist in the private sector. The annual output is 23,000 for degree and 11,200 for diploma courses. The allocation to technical education has ranged between four percent (1984-85) and 15 percent (1982-83) of the sector budget. Cost per student is approximately \$1,203.

4. Centers of Excellence

An analysis of all the nine Centers of Excellence is provided in Table 6, below. This data, collected by the University Grants Commission, indicates that the total cost for the establishment of the nine institutes was approximately \$11.7 million. In addition, development grants totalling approximately \$9.3 million have been provided to the Centers from the day of establishment to 1986. The total recurrent budget expenditure for 1981-88 was approximately \$4 million.

The amount spent on the science and technology sector during the entire Six Five Year Plan was approximately \$207 million which was 77 percent of the total allocation during the Plan period. In the Seventh Five Year Plan, the allocation for science and technology has been almost doubled to a level of \$370 million. The estimated expenditures against the allocation in the Sixth Five Year Plan for the Ministry of Science and Technology and the various institutes under it were approximately \$43 million.

Table 6

Analysis of Establishment Cost,
Annual Development Grants and Recurrent Budget
of the COES
(In \$ 000)

Center of Excellence	Date of Estab.	Initial Cost of Establishment			Total Develop. Grant To date	Recurrent Budget 1981-1988
		Fx	Lc	Total		
Geology NWFP	Aug 1974	471	630	1,01	1,122	485
Physical Chemistry NWFP	Apr 1978	388	966	1,354	1,090	553
Solid State Physics Punjab	Aug 1974	1,576	497	2,073	1,891	514
Water Resources Punjab	Feb 1986	585	815	1,400	2,288	147
Molecular Biology Punjab	Feb 1986	558	734	1,292	460	526
Analytical Chemistry Sind	Aug 1974		1,553	1,553	863	495
Marine Biology Sind	Aug 1974	525	335	860	723	595
Minerology Baluchistan	Aug 1974	1,115	369	1,484	685	349
Psychology Islamabad	Jul 1983		545	545	202	322
		5,218	6,444	11,660	9,324	3,986

Estimated Cost of Other Departments/Institutes

Structural Engineering Lahore	1,033	0	1,033	1,033*
Electrical Engineering Lahore	1,053	395	1,447	237**
Applied Genetics and Saline Ag., Faisalabad			383	2,311***

* Recurrent cost for three years

** Annual recurrent cost

*** Recurrent cost for five years and includes setting up and staffing four offices and eight sections

5. Science and Technology

The impediments to the development of science and technology include: poor educational standards, inadequate investment of resources, including manpower, research funds, and physical facilities, the isolation of science and technology from economic and development planning and market requirements, and the lack of proper incentives and accountability procedures. The Seventh Five Year Plan intends to consolidate and strengthen the science and technology sector to improve its effectiveness and to enable it to respond to national requirements. The specifically identified requirements are: to increase national productivity and competitiveness in agriculture, industry and mining, to provide improved services with reduced unit cost in areas such as transportation, energy, health care, sanitation and clean drinking water, and productive exploitation of indigenous natural resources while emphasizing resource conservation and replenishment. Research is expected to be target oriented and technological development efforts are to be directed toward user needs and market demands.

The Plan intends to expand manpower development programs. The need for a more conducive environment to retain good scientists and technologists through an appropriate reward and incentive system and proper facilities is also identified. Linkages between local R&D agencies and the international community are proposed. One of the major constraints identified is the fragmented nature of the R&D effort, i.e., no coordination among the various institutes, universities and user agencies. A second constraint is the poor quality of science education in schools and universities and the inadequacy of university research and its relationship to the technological effort. A third constraint is the almost complete absence of R&D patronage by the private sector. A fourth problem is the isolation of the R&D effort from user requirements and market demand. Final constraints are the inefficient facilities for researchers and the absence of up-to-date international information on progress in scientific fields.

The Plan recognizes the declining standards in educational institutions at all levels particularly those relating to science and technology. It acknowledges the need to nurture university research by continuously feeding the R&D system (including research institutes) with fresh minds and qualified manpower while reducing reliance on imported expertise and foreign training. It proposes to provide universities with better laboratory facilities and libraries, and to encourage contract research and active collaboration with applied research organizations.

The total expenditure for Science and Technology during the Sixth Five Year Plan was \$207 million against an allocation of approximately \$268 million.

The total amount allocated under the Seventh Five Year Plan is increased to approximately \$370 million.

The budget for the institutes under the Ministry of Science and Technology is presented in Table 7 and for the entire sector in Table 8.

Table 7
Estimated Expenditure of Institutes under the
Ministry of Science & Technology under the
allocation of the Sixth Five Year Plan

(In million Rupees)

1. National Institute of Electronics	71.8
2. National Institute of Power	14.4
3. Pakistan Medical Research Council	26.6
4. Pakistan Council of Science & Industrial Research	164.3
5. Pakistan Council for Appropriate Technology	19.8
6. Pakistan Institute of Oceanography	30.7
7. Pakistan Council of Research in Water Resources	46.0
8. Pakistan Science Foundation	32.1
9. Council for Works and Housing Research	17.6
10. Pakistan Council for Science & Technology	12.8
11. National Center for Transfer of Technology	10.5
12. National Institute of Silicon Technology	50.5
	<u>497.1</u>
Ministry of Science and Technology	316.1
	<u>813.2</u>
In U.S. Dollars at Rs.19.00 = \$ 1.00	\$42.80

Table 8
Summary by Sector - Science and Technology

(In \$ Million)

<u>Sector</u>	<u>Sixth Plan</u> <u>Actuals</u>	<u>Seventh Plan</u> <u>Allocation</u>
1. Agriculture	100.63	75.74
2. Industry and Minerals	20.58	56.00
3. Health & Nutrition	3.26	4.42
4. Water	2.42	6.53
5. Energy	2.89	39.84
6. Transport & Communications	2.58	15.47
7. Physical Planning & Housing	2.68	1.05
8. Education and Training	70.26	145.26
9. National Research Fund		26.32
10. Population Welfare Program	1.84	
Total	<u>207.02</u>	<u>370.63</u>

GDP Expenditures: Education Sector
(in million rupees)

	Total	Primary	Secondary	College	University	Technical	Teachers	Other	Develop- mental	Non-Develop- mental
1977-78	3300.7	823.6	464.7	672.4	258.0	323.1	58.5	700.4	855.0	2445.7
1978-79	3375.9	1305.1	731.7	767.8	324.2	515.2	73.3	558.6	1,067.0	2808.9
1979-80	4153.5	1604.4	820.4	387.5	426.2	518.7	71.0	325.3	1,060.2	3093.3
1980-81	4619.1	1570.5	918.8	427.6	459.2	546.5	57.4	639.1	1,240.5	3378.6
1981-82	5602.2	1820.0	986.9	493.8	611.3	748.8	83.5	857.9	1,687.4	3914.6
1982-83	6469.9	2096.2	1256.0	642.0	665.5	952.7	100.7	756.8	1,940.5	4529.0
1983-84	7484.7	2543.6	1599.0	784.3	701.7	1003.1	96.4	756.6	1,715.4	5826.9
1984-85	8939.2	3280.2	2369.3	1033.8	925.7	389.4	252.1	688.7	1,873.2	7020.2
1985-86	10518.3	3791.3	2634.4	1115.5	997.8	615.5	305.1	1,058.7	2,582.8	8908.5
1986-87	12681.5	4478.7	2899.4	1227.7	1355.2	972.9	369.2	1,378.4	2,176.4	10234.4

Table 9B
Institutional Excellence Project
Intra-Sectoral Allocation of
the Education Budget

1977-78	100%	0.25	0.14	0.20	0.08	0.10	0.02	0.21	0.26	0.74
1978-79	100%	0.34	0.19	0.09	0.08	0.13	0.02	0.14	0.28	0.72
1979-80	100%	0.39	0.20	0.09	0.10	0.12	0.02	0.08	0.26	0.74
1980-81	100%	0.34	0.20	0.09	0.10	0.12	0.01	0.14	0.27	0.73
1981-82	100%	0.32	0.18	0.09	0.11	0.13	0.01	0.15	0.30	0.70
1982-83	100%	0.32	0.19	0.10	0.10	0.15	0.02	0.12	0.30	0.70
1983-84	100%	0.34	0.21	0.10	0.09	0.13	0.01	0.10	0.23	0.78
1984-85	100%	0.37	0.27	0.12	0.10	0.04	0.03	0.08	0.21	0.79
1985-86	100%	0.36	0.25	0.11	0.09	0.06	0.03	0.10	0.25	0.85
1986-87	100%	0.35	0.23	0.10	0.11	0.08	0.03	0.11	0.17	0.81

Table 9C
Institutional Excellence Project
Enrollment

Total	University							
	Primary Schools	Middle Schools	High Schools	Secondary Vocational	Arts Science	Professional College		
1977-78	7175243	5015000	1304000	506000	26000	221000	62113	41130
1978-79	7278919	5131000	1301000	479000	29000	233000	67296	38623
1979-80	7482299	5213000	1391000	476000	35000	253000	72479	41810
1980-81	7803585	5474000	1412000	309000	40000	270000	55897	42688
1981-82	8211175	5741000	1494000	543000	45000	283000	57602	47573
1982-83	8704499	6179000	1494000	578000	49000	297000	58587	48912
1983-84	9710694	6860000	1730000	606000	53000	355000	56276	50418
1984-85	10413200	7389000	1805000	676000	57000	373000	59169	54031
1985-86	10883953	7733000	1891000	680000	59000	397000	62062	59891
1986-87	11353398	8081000	1977000	684000	61000	421000	64955	64443

Table 10
 Institutional Excellence Project
 GOP Expenditure: Education Sector
 (in million dollars current)

	Total	Primary	Secondary	College	University	Technical	Teachers	Other	Develop- mental	Non-Develop- mental
1977-78	333.4	83.2	46.9	67.9	26.1	32.6	5.9	70.7	86.4	247.0
1978-79	391.3	131.8	73.9	37.2	32.7	52.0	7.4	56.4	107.8	283.7
1979-80	419.5	162.1	82.9	39.1	43.1	52.4	7.2	32.9	107.1	312.5
1980-81	466.6	158.6	92.8	43.2	46.4	55.2	5.8	64.6	125.0	341.0
1981-82	565.9	183.8	99.7	49.9	61.7	75.6	8.4	86.7	170.4	395.4
1982-83	509.2	165.0	98.9	50.5	52.4	75.0	7.9	59.6	152.7	356.4
1983-84	555.2	188.7	118.6	58.2	52.1	74.4	7.2	56.1	127.3	432.0
1984-85	590.0	216.5	156.4	68.2	61.1	25.7	16.6	45.5	123.6	463.4
1985-86	651.7	234.9	163.2	69.1	61.8	38.1	18.9	65.6	160.0	552.0
1986-87	738.2	260.7	168.8	71.5	78.9	56.6	21.5	80.2	126.7	595.7

GDP Deflation

Total GOP Expenditure in millions of US Dollars Real

1977-78	1.00	333.4	83.2	46.9	67.9	26.1	32.6	5.9	70.7	86.4	247.0
1978-79	1.03	379.0	127.6	71.6	36.0	31.7	50.4	7.2	54.6	104.3	274.7
1979-80	1.16	361.6	139.7	71.4	33.7	37.1	45.2	6.2	28.3	92.3	269.3
1980-81	1.28	363.8	123.7	72.4	33.7	36.2	43.0	4.5	50.3	97.7	266.1
1981-82	1.40	403.4	131.1	71.1	35.6	44.0	53.9	6.0	61.8	121.5	281.9
1982-83	1.48	343.2	111.2	66.6	34.1	35.3	50.5	5.3	40.1	102.9	240.3
1983-84	1.62	342.0	116.2	73.1	35.8	32.1	45.8	4.4	34.6	78.4	266.2
1984-85	1.722	342.6	125.7	90.8	39.6	35.5	14.9	9.7	26.4	71.8	269.1
1985-86	1.808	360.4	129.9	90.3	38.2	34.2	21.1	10.5	36.3	88.5	305.2
1986-87	1.871	394.6	139.4	90.2	38.2	42.2	30.3	11.5	42.9	67.7	318.5
with 1st 5 years	3.89%		9.52%	8.65%	-12.14%	11.05%	10.56%	0.35%	-2.67%	7.07%	2.68%
with 2nd 5 years	2.83%		4.62%	6.25%	2.32%	3.62%	-9.74%	16.55%	1.33%	-8.03%	5.80%
annual growth	1.70%		5.30%	6.75%	-5.59%	4.93%	-0.75%	6.87%	-4.88%	-2.40%	2.57%

Table 11
 Institutional Excellence Project
 Nominal cost per student

	Primary I-V	Secondary* VI-X	College Art/Science	University	Technical**
1977-78	16.6	25.6	307.3	633.6	620.6
1978-79	23.7	40.9	159.4	847.9	863.3
1979-80	31.1	43.6	134.7	1029.7	821.8
1980-81	29.0	47.3	160.0	1086.6	1091.3
1981-82	32.0	47.9	176.3	1298.0	1459.5
1982-83	26.7	46.6	170.1	1070.8	1415.1
1983-84	27.5	49.7	163.9	1032.5	1449.4
1984-85	29.3	61.6	182.9	1130.9	715.6
1985-86	30.4	62.1	174.1	1032.2	919.1
1986-87	32.3	62.0	169.7	1224.1	1202.7
growth 1st 5 year	14.06%	13.37%	-10.52%	15.42%	18.65%
growth 2nd 5 year	3.86%	5.87%	-0.05%	2.71%	-3.20%
av. annual growth	6.88%	9.26%	-5.76%	6.81%	6.84%

Secondary education includes secondary vocational.
 Technical education includes Professional colleges and Teachers Education.

Institutional Excellence Project
 Real cost per student

	Primary I-V	Secondary* VI-X	College Art/Science	University	Technical**
1977-78	16.59	25.57	307.33	633.62	620.57
1978-79	24.87	39.56	154.37	820.89	835.22
1979-80	26.79	37.55	133.33	887.39	708.27
1980-81	22.60	36.91	124.75	847.32	851.00
1981-82	22.83	34.13	125.65	925.33	1040.51
1982-83	18.00	31.41	114.67	721.80	953.84
1983-84	16.94	30.58	100.94	635.91	892.69
1984-85	17.01	35.78	106.23	656.64	415.53
1985-86	16.79	34.32	96.28	570.85	508.26
1986-87	17.25	33.15	90.74	654.39	642.96

Table 12
 Institutional Excellence Project
 Total Number of Teachers

	Primary Schools #	Middle Schools #	High Schools #	Secondary Vocational #	Arts Science #	Professional College #	University #
1977-78	134,400	48,800	60,600	2,225	11,548	3,331	3,265
1978-79	136,900	49,900	62,900	2,532	11,836	3,443	3,577
1979-80	140,900	51,400	63,800	2,817	12,077	3,500	3,068
1980-81	150,000	52,700	65,900	3,171	12,584	3,343	3,288
1981-82	159,100	53,700	68,700	3,408	12,691	3,609	3,457
1982-83	168,100	55,100	70,400	3,616	13,000	3,628	3,530
1983-84	175,300	57,800	78,300	3,835	13,130	3,769	3,774
1984-85	191,600	60,200	88,300	4,034	13,951	3,884	3,846
1985-86	199,700	61,800	91,600	4,190	14,210	3,999	3,880
1986-87	207,800	63,400	94,900	4,346	14,469	4,114	4,018
growth 1st 5 years	3.43%	1.93%	2.54%	8.90%	1.91%	1.62%	1.15%
growth 2nd 5 years	4.33%	2.85%	6.15%	3.75%	2.16%	2.55%	2.62%
av. annual growth	4.45%	2.65%	4.59%	6.92%	2.28%	2.13%	2.10%

Student/Teacher Ratio

	Primary Schools #	Middle Schools #	High Schools #	Secondary Vocational #	Arts Science #	Professional College #	University #
1978-79	37	26	8	11	20	20	11
1979-80	37	27	7	12	21	21	14
1980-81	36	27	8	13	22	17	13
1981-82	36	28	8	13	22	16	14
1982-83	37	27	8	14	23	16	14
1983-84	39	30	8	14	27	15	13
1984-85	39	30	8	14	27	15	14
1985-86	39	31	7	14	28	16	15
1986-87	39	31	7	14	29	16	16

Table 13
Institutional Excellence Project

	Number of institutions						
	Primary Schools	Middle Schools	High Schools	Secondary Vocational	Arts Science	Professional College	University
1977-78	53,882	5,100	3,239	222	430	95	15
1978-79	55,265	5,194	3,321	223	429	99	15
1979-80	57,220	5,233	3,361	219	430	99	15
1980-81	59,168	5,295	3,479	231	433	99	19
1981-82	61,117	5362	3,597	247	440	99	20
1982-83	63,066	5,432	3,715	263	447	99	20
1983-84	72,758	5,984	4,213	279	469	99	20
1984-85	82,550	6,132	4,630	290	467	99	21
1985-86	86,142	6,290	4,809	293	470	100	22
1986-87	88,734	6,448	4,988	296	473	100	22
Over 1st 5 Yr	2.55%	1.01%	2.12%	2.16%	0.46%	0.83%	5.92%
Over 2nd 5 Yr	7.07%	3.49%	6.07%	2.39%	1.14%	0.20%	1.92%
AV. per annum	5.11%	2.37%	4.41%	2.92%	0.96%	0.51%	3.90%
Incremental	Primary Schools	Middle Schools	High Schools	Secondary Vocational	Arts Science	Professional College	University
1977-78	1,383	94	82	1	(1)	4	0
1979-80	1,955	39	40	(4)	1	0	0
1980-81	1,948	62	118	12	3	0	4
1981-82	1,949	67	118	16	7	0	1
1982-83	1,949	70	118	16	7	0	0
1983-84	9,692	552	498	16	22	0	0
1984-85	9,792	148	417	11	(2)	0	1
1985-86	3,592	158	179	3	3	1	1
1986-87	2,592	158	179	3	3	0	0

C. Economic Analysis

1. Education in Pakistan

a. Overview

The education sector has been severely neglected in Pakistan. Total expenditure (development and recurring) on education as a percentage of GNP is less than half the recommended figure (4 percent) of UNESCO and less than that of most of the developing countries in the region. Funds allocated to education as a percentage of total government expenditure are also very low (only 5.1 percent in 1981) relative to other developing countries in the region (Table II.1). Bangladesh, for example, allocated 8.6 percent of its total government expenditures to education during the same period despite significantly lower per capita income.

The literacy rate in Pakistan is 24 percent, among the lowest in the world. School enrollment ratios are low relative to other South Asian developing countries (Table II.2). Only 49 percent of its primary school age and 16 percent of its secondary school age children are enrolled in schools. Not only is the number of illiterates staggering, but the quality of education needs to be upgraded. Various studies have shown that higher education graduates, for example, enter the labor market inadequately trained. 1/

2. Manpower Projections

Based on population growth projections for Pakistan, the size of the labor force is projected to reach 35.5 million by the end of the Seventh Five Year Plan. To meet economic development goals contained in the Seventh Plan, labor force participation rates will have to rise and the educational level of new entrants must increase. It has been estimated that 1.1 million new labor force entrants will be unemployed by the end of the Seventh Plan simply because they are untrained or illiterate.

1/ "Pakistan: Sector Study on Education", Asian Development Bank, April 1988

TABLE II.1
PUBLIC EXPENDITURE BY LEVEL OF EDUCATION
IN SOUTH ASIA

Country	Public Expenditure on Education			
	% of GNP 1/		% Total Govt Expenditure 2/	
	1981	1982	1981	1982
<u>Developing Countries</u>				
Pakistan	1.9 3/	-	5.1	-
Bangladesh	1.7	-	8.6	-
India	3.0	-	9.6	-
Nepal	1.9	2.5	-	-
Sri Lanka	3.0	-	8.7	-
Indonesia	2.2	-	9.3	-
Korea, Rep. of	3.5	4.3	18.6	21.5
Thailand	3.7	3.9	20.3	20.3
Singapore	3.7	3.9	8.5	9.6
<u>Developed Countries</u>				
Australia	5.8	-	14.5	-
Japan	6.0	-	19.4	-
U.S.S.R.	7.0	6.7	10.9	10.3

Source:

- 1/ Reproduced from Table 33 of document ED/85/MINEDAP/Ref.2 prepared for the Regional Conference of Education Ministers by UNESCO, Bangkok March 1985.
- 2/ Table 34 of document ED/85/MINEDAP/Ref 2, prepared by UNESCO, Bangkok March 1985.
- 3/ Public expenditure on education in Pakistan as a percent of GNP was 1.56 in 1983 and 2.4 in 1988.

TABLE II.2
SCHOOL ENROLLMENT RATIOS
BY LEVEL OF EDUCATION IN SOUTH ASIA

	Enrollment Ratio (%)		
	Primary	Secondary	Higher
Pakistan	49.0	16.0	1.7
Afghanistan	30.0	10.0	1.7
Bangladesh	63.0	15.0	3.0
India	70.0	28.0	8.8
Nepal	91.0	21.0	3.2
Sri Lanka	100.0	51.0	2.5

Source: UNESCO, Statistical Year Book, New York, 1982

While it is necessary for the Government of Pakistan to give a higher priority to the education sector as a whole, manpower projections show that investment in higher education is especially crucial ^{1/}. Relative shortages of higher education graduates are projected to occur by 1992/93, in contrast to the surplus of higher education graduates projected in the preparation of the Fifth and Sixth Five Year Plans (see Table V.3). This reversal is due to a variety of factors including: the changing, and modernizing structure of the economy--specifically the relative growth of the manufacturing sector; and the effect of previously adopted policy measures aimed at expanding lower levels of education and restraining higher education.

Specifically, manpower projections indicate a shortage of intermediate, degree and post-degree graduates in technical areas and a surplus in the professional and administrative occupations. These projections are essentially consistent with UNESCO figures which suggest that a country of Pakistan's size and level of development should have a cadre of approximately 25,000 scientists engaged in R&D activities, as opposed to 6,500 such scientists currently in Pakistan.

3. Other Donor Involvement

The role of other donor agencies in educational development of Pakistan is concentrated at the primary and secondary levels although Section V discussed other donor involvement in higher education. Moreover, USAID itself is helping to address Pakistan's needs in primary education through a \$280 million Primary Education Project, which will focus on Baluchistan and NWFP, and is in the design stage. Thus the IEP constitutes an essential part of an appropriately balanced effort on the part of donors in general, and USAID in particular, to assist the GOP in strengthening the education sector. While achieving more widely accessible and higher quality primary education is perhaps the most compelling long-term educational challenge confronting Pakistan at present, there are very real immediate needs in higher education which must be addressed if Pakistan is to sustain a reasonably high rate of economic growth ^{2/}. In this context, the objectives of the Institutional Excellence Project: (a) to address the need for more students trained to the M.S. and Ph.D. levels in science and technology, (b) to improve the quality of research, facilities and to lab equipment, and (c) to upgrade instruction in science and technology, could not be more appropriate or timely.

^{1/} S.I. Cohen, "Labor Force Matrix of Pakistan: Selected Applications", Pakistan Development Review, Autumn-Winter, 1985, p.565

^{2/} The GOP has recognized this need itself. One of the Seventh Plan strategies is to improve the quality of education at the university level.

2. Economic Benefits from Higher Education

a. Theory of Benefit Estimation

It is often difficult to quantify the economic benefits derived from investments in human capital in general, and in higher education in particular. The standard approach to benefit estimation focuses only on the additional lifetime earnings gained as a result of investing in higher education instead of joining the labor force immediately after the completion of secondary education. Thus a variety of other potential benefits from higher education investment are ignored. Examples of the types of benefits not included in this approach are: (a) fringe benefits; (b) psychic benefits (i.e. worker satisfaction) associated with jobs in occupations that require higher education (normally these jobs are more pleasant and interesting than more routine jobs requiring less education); and (c) external benefits to higher education such as greater research findings or more rapid technology transfer and adaptation.

On the other hand, estimates of rates of return to higher education based on earnings differentials do not control for the contribution ability makes to higher earnings and, therefore, overstate the gain an individual obtains by investing in higher education. However, as long as educational qualifications are used as a screening device in hiring, it is reasonable to assume that earnings differentials reflect the gain from investing in more schooling ^{1/}.

In developing countries, most university graduates are employed in the government sector. As a result, it is argued by some that wages are institutionally, rather than market, determined. In this case, earnings differentials may not be good proxies for increased productivity. On the whole, however, economists reject this view since competition between the public and private sectors in labor markets should ensure that public sector wages are closely related to actual productivity.

b. Economic Benefits of the IEP

The IEP will provide definite monetary benefits to the individuals that obtain university degrees at U.S. universities or at Centers of Excellence, Centers of Advanced Studies or university departments, supported by the project. Lifetime earnings differentials associated with various levels of higher education for males and females are summarized in Table III.1. It is these differentials which provide the basis for estimating the economic

^{1/} Most studies attempting to identify the separate effects of ability and schooling have concluded that the effects of ability are relatively small (accounting for, at the most, one fifth of observed earnings differentials). See Zvi Griliches and William M. Mason "Education, Income and Ability" and John C. Hause, "Earnings Profile: Ability and Schooling", both in Journal of Political Economy 80,3, (May/June) 1972.

benefits of, and economic rates of return to, higher education in Pakistan (see Section D).

The IEP should also result in significant external benefits to Pakistan as a whole. 1/ The short-term and long-term training in science and technology fields, together with the links established between universities in Pakistan and in the United States, should facilitate more effective research and technology transfer in Pakistan. Furthermore, the IEP aims to address: (a) the separation of research and instruction, and (b) the separation of research from development needs. With regard to (a) it is a common observation that university graduates (with the exception of a few COE) do not receive the benefit of contact with the most recent technologies or scientific research methodologies. As a result, in many industrial fields where modern technology has been adopted, there is a shortage of properly qualified and trained persons. The IEP through the use of teaching assistants will enable faculty to undertake research projects and be kept upto date in current technology. With regard to (b) it has been documented that much of the research being done has little or no relation to national and provincial needs for economic development. The IEP will require sub-project proposals to demonstrate that research is user-driven and related to high priority national or provincial development needs. This, in turn, should contribute to Pakistan's economic development.

It should be noted that while the external benefits described above are expected to occur as a result of IEP, it is not possible to quantify them with any accuracy at this point. As a result, they are not included in the measures of economic benefits which are used in Section D (together with estimates of economic costs) to determine economic rates of return to investments in higher education in Pakistan. Therefore, these rates of

1/ Empirical studies in other sectors in Pakistan have shown that expenditures on research and extension pay a favorable rate of return (between 55 and 65 percent to all expenditures on agricultural research and extension). See "The Pakistan Agricultural Development Model: An Economic Evaluation of Agricultural Research Extension Expenditures", by Joseph Gilbert Hagy, submitted to the Graduate School, University of Minnesota, March 1984.

return estimates should be viewed as minimum estimates. Actual economic returns will likely be higher. 1/

TABLE III.1
LIFETIME NET EARNINGS DIFFERENTIAL
FOR HIGHER EDUCATION IN PAKISTAN

		<u>Rs.</u>
Bachelors (13-15 years of schooling)	M	116,565
	F	51,526
Masters (16-17 years of schooling)	M	219,740
	F	125,230
Ph.D. (18-20 years of schooling)	M	575,870
	F	229,820

3. Economic Costs of Higher Education

a. Overview

The economic costs of higher education can be divided into three categories:

- Direct expenses which include tuition, books, and moving expenses;
- Foregone earnings, because during the investment period it is usually impossible to work, at least full time;
- Psychic losses, because of studying and being examined.

Source: Mc Mahon, Walter, Draft Economic Analysis for Primary Education Project.

1/ Estimated rates of return will be on the low side for several other reasons as well. First, they are based on current earnings differentials which naturally reflect the low quality of Pakistan's existing higher education system, e.g. ADB's "Pakistan: Sector Study on Education" identifies poor academic preparation as one of the principal causes of unemployment among higher education graduates. To the extent that the IEP succeeds in improving the quality of higher education, earnings differentials in favor of higher education will increase as will the rates of return to higher education. Second, manpower projections indicate growing shortages of highly educated workers in the future. This should increase their relative earnings and hence the returns to higher education.

It is these costs, specifically the first two, which are included in the rate of return analysis of higher education investment presented in Section D.

The costs of higher education are normally incurred over a relatively short period of time, and are high relative to other levels of education. This is true especially in developing countries. It is not surprising, therefore, that higher education is often given a low priority in state budgetary allocations.

An analysis of university costs at the aggregate level reveals the existence of considerable returns to scale. It has been shown that the per student unit costs decrease as university enrollments rise, especially up to the point corresponding to a 3 percent university enrollment ratio.^{1/} The implication of this finding for countries with a low level of university enrollment (like Pakistan) is that higher education costs per student will likely decline as enrollments are increased.

2. GOP Spending on Education

Over the Sixth Five Year Plan, a total of Rs.18,830 million was allocated to education.^{2/} While higher education received 28 percent of the total allocation^{3/}, actual expenditures fell short of allocated funds. Only Rs.13,430 million were actually invested in education during the Sixth Plan Period. The proposed Seventh Plan allocation to education is Rs.24,060 million (an increase of 28 percent). Higher education, however, will receive a lower relative share of funds (25 percent of the total allocated to education) compared to the Sixth Plan Period. In this context, IEP funds can help bridge the gap between the GOP's commitment to strengthening higher education and the internal resources available to achieve that goal.

The allocations for development (capital) and non-development (recurrent) expenditures, by level show that, on average, development expenditure is about one-third of recurrent expenditure.^{4/} In 1983/84, 24 percent of the total education expenditures were distributed in capital investment and 76 percent in recurrent expenditure. About 25 percent of recurrent expenditure went to higher education.^{5/}

^{1/} Psacharopoulos G., "Higher Education in Developing Countries: A Cost-Benefit Analysis", World Bank Staff working paper No.440, Nov. 1980

^{2/} Government of Pakistan, Planning Commission Proposals, Draft Seventh Five Year Plan 1988-93 and Perspective Plan 1988-2003

^{3/} Higher education includes funds allocated to technical college, university education and scholarships

^{4/} Asian Development Bank, "Pakistan: Sector Study on Education" April 1988, p.52

^{5/} Includes college, technical and university education.

c. Subsidies and Sustainability

Education is highly subsidized in developing countries. Table IV.1 provides an indication of this subsidy in Pakistan. Even though a substantial increase occurred in the recurring cost per student during the Sixth Plan period, only a small fraction of the cost was recovered in fees. It is also evident from Table IV.1 that higher education is especially expensive. The evidence provided in Table IV.1 concerning the relative levels of per student recurrent costs and fees by educational level makes it clear that the gap between recurrent costs and fees is greatest for higher education. Higher education in Pakistan is clearly not financially self-sustaining. If this gap is not filled by GOP funds, then the higher education system will deteriorate. In fact, there is reason to believe that this has been happening. Given both the GOP's dire financial straits and the IEP's emphasis of improving the quality (and hence increasing the recurrent cost) of higher education, the issue of sustainability is clearly an important one which affects the long-term viability of the IEP. Higher education in Pakistan will likely need to mobilize more of its own resources if quality improvements are to be sustained.

4. Economic Returns to Higher Education

a. Overview

This section assesses the economic rate of return to investments in higher education in Pakistan. This is done by comparing the present value of economic benefits (measured by earnings differentials--as discussed in Section III) with the present value of economic costs (foregone earnings and direct expenses). Such rates of return should provide an indirect measure of the economic return to the IEP since, after all, those project resources will be used in higher education and should allow more students to receive a higher quality education. This indirect approach has been chosen since there is no reliable method of quantifying ex ante the economic benefits which result directly from the application of the IEP resources to institutions of higher education. In fact, the actual economic returns to the IEP resources should actually be higher than indicated by this indirect approach since those resources are targeted at what is judged to be particularly weak links in the higher education system.

TABLE IV.1
ANNUAL RECURRENT COST AND TUITION FEES BY
EDUCATIONAL LEVEL PER STUDENT
(Pak Rs.)

<u>Educational Level</u>	<u>1982/83</u> (a)	<u>1987/88</u> (b)	<u>Average Cost recovered as Tuition Fee (Rs.)</u> (c)	<u>Average Subsidy (%)</u> (c)/(b)
Primary	350	650	Nil	100
Secondary	500	1,200	60 (In Punjab and Federal Govt Educational Institutions)	95
College	2,200	2,850	F.A. 180 B.Sc. 240	94 92
University: General	8,522	15,282	M.A. 240 M.Sc. 300	98 98
Technical	5,156	10,387	90	99

b. Economic Rate of Return Estimates

Based on a sample of 26,610 urban dwellers over age 15 nationwide collected in the Pakistan Household Income and Expenditure Survey, 1985, rates of return to investment in various levels of education were recently estimated as shown in Table V.1. The results of this analysis indicate that the rate of return to investment in primary education is higher than the return to investment in higher education (33 percent for primary vs 11 percent for university graduates of Ph.D. programs). The rate of return to investment in undergraduate degrees is low (only 3 percent). This could be mainly due to a current oversupply of first degree graduates (and to the low quality of the education they received).

The estimated rate of return to investment on higher education in Pakistan presented here is less than the average rate of return to higher education computed for a group of developing countries (Table V.2). In Pakistan, it is only at most 11 percent compared to an average rate of return to higher education in developing countries estimated to be 14.9 percent. As was pointed out in Section IV, the cost of higher education in Pakistan is very high and this, together with quality factors and past labor market conditions, could be reasons for a relatively lower rate of return.

Source: Government of Pakistan, Planning Commission Proposals.
Draft Seventh Five Year Plan 1988-93 and Perspective Plan
1988-2003

TABLE V.1

ECONOMIC RETURNS TO INVESTMENT IN EDUCATION IN PAKISTAN
(%)

<u>Level of Education</u>	<u>Based on a sample of 26,610 Urban Dwellers</u>	
Incomplete Primary	M	74
	F	8
Primary	M	33
	F	8
Middle Jr. High (grades 6, 7, 8)	M	6
	F	5
Matriculate (grades 9, 10)	M	-3
	F	-
Intermediate (grades 11, 12)	M	3
	F	-7
Bachelors Degree	M	3
	F	-
Masters Degree	M	10
	F	6
Ph.D. Degree	M	11
	F	6

An economic rate of return of about 10 percent is normally considered a reasonable economic justification for a project in the social sector. In this respect, the 10 and 11 percent rates of return to investments in Masters and a Ph.D. programs, respectively provide economic justification for the IEP. Once again, it should be stressed that the direct rate of return for the project would be higher if all the non-quantifiable benefits as a result of the implementation of IEP (as discussed in Section III) are taken into account. In addition, rates of return will likely be higher in the future due to changing labor market conditions.

Note: Rates of Return are social, i.e. they include all measurable economic costs and benefits associated with higher education. All rates of return were computed by including the small or zero earnings of individuals responding "Not Working". Higher unemployment rates in a particular category lower the rates of return. Many urban women reported not working even though they may be working at home caring for children. Therefore, rates of return based on money earnings that include these home earners are not meaningful for comparison.

TABLE V.2
ECONOMIC RETURNS TO HIGHER EDUCATION AND
PHYSICAL CAPITAL IN SELECTED COUNTRIES
(%)

<u>Country</u> <u>Capital</u>	<u>Higher Education</u>	<u>Physical</u>
Mexico	23.0	14.0
Colombia	8.0	2.0
Venezuela	23.0	16.7 <u>a/</u>
Chile	16.3	15.0
Brazil	14.5	10.0
India	12.7	12.5 <u>b/</u>
Philippines	11.0	10.5
Ghana	16.5	8.0
Kenya	8.8	18.8
Uganda	12.0	10.0 <u>c/</u>
Nigeria	17.7	23.0 <u>d/</u>
U.S.A.	9.7	9.7
Canada	14.0	12.9
U.K.	8.2	8.6
Netherlands	5.5	16.8
Belgium	9.3	4.4
Developing Countries (average)	14.9	12.8
Developed Countries (average)	9.3	10.5

NOTE: These are social rates of return.

- a/ Irrigation Project
- b/ Hydroelectric Project
- c/ Highway Project
- d/ Road Project

SOURCE: Reproduced from "Higher Education in Developing Countries: A Cost-Benefit Analysis" Psacharopoulos G.W.B. Staff Working Paper No.440, November 1980.

c. Employment

Some have argued that the apparent current surplus of unemployed university graduates (undergraduates in particular) in Pakistan does not justify additional resources being invested in higher education. At least two arguments can be made in opposition to this point of view. First, empirical studies have shown that it is secondary graduates who exhibit the highest unemployment rate ^{1/}. Contrary to popular belief, statistics demonstrate that the incidence of unemployment among university graduates is more or less equal to the average unemployment rate for the working population as a whole (and is generally lower than the overall unemployment rate in urban areas).

Second, forecasts of labor demand and supply for 1992/93 show shortages of higher education graduates (Table V.3). Implementing the IEP now will help address these forecast future imbalances.

TABLE V.3
CONDITIONAL FORECASTS OF DEMAND, SUPPLY
AND IMBALANCES 1992/93
(,000's)

<u>Educational Level</u>	<u>Demand (D)</u>	<u>Supply (S)</u>	<u>Imbalance</u> $\frac{(S-D)}{S}$
Incomplete Primary or Less	23,563	24,800	0.50
Primary	4,194	3,915	-0.07
Secondary	2,769	2,884	0.04
Higher Secondary	2,680	2,653	-0.01
Intermediate	1,063	916	-0.16
Undergraduate	590	490	-0.20
Post-graduate	338	257	-0.32
TOTAL	35,197	36,974	.02

^{1/} See World Bank, "Pakistan: Sixth Plan Progress and Future Prospects", February, 1987. In reality, this whole issue is clouded by the lack of reliable unemployment data.

SOURCE: Reproduced from "Pakistan: Sector Study on Education", ADB, Appendix 10.B, April 1988.



UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

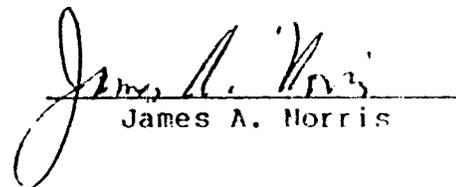
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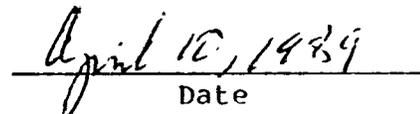
HEADQUARTERS OFFICE
ISLAMABAD

INSTITUTIONAL EXCELLENCE PROJECT (391-0498)

Certification for Compliance With Gray Amendment

I, James A. Norris, the principal officer of the Agency for International Development in the Islamic Republic of Pakistan, do hereby certify that the acquisition plan in the Project Paper was developed with full consideration of maximally involving the Minority and Women-Owned Firms, or Gray Amendment Organizations, in the provision of required goods and services. Set-aside opportunities for such organizations to participate in this project have been assessed and deemed inappropriate at this stage. However, such organizations are encouraged to compete or contract awards, and prime contractors are expected to make an effort to sub-contract, as appropriate, with these entities. During the course of implementation, opportunities for such organizations to participate in the project will be further considered.


James A. Norris


Date

LOGICAL FRAMEWORK
INSTITUTIONAL EXCELLENCE PROJECT

Annex 9

Life of Project:
From FY 1989 to FY 1999
Total U.S. Funding \$ 80 million
Date Prepared: April 10, 1989

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes: To enhance Pakistan's capability to develop, adapt, utilize, and advance scientific and technological innovations for development purposes</p>	<p>Measures of Goal Achievement: -An institutional structure which encourages and facilitates S&T activities -An adequate pool of well trained scientists and technicians -Effective incentives for focusing S&T efforts on key developmental constraints</p>	<p>Sectoral review of government, non-government, and private sector scientific and technological innovations</p>	<p>Assumptions for achieving goal targets: -GOP will continue to promote and support S&T efforts in Pakistan</p>
<p>Project Purpose: -To assist selected departments of universities and institutions to improve and expand their teaching and research capabilities in areas of science and technology. critical for national development</p>	<p>Conditions that will indicate purpose has been achieved. <u>End of Project Status.</u> Pakistani science and technology departments participating in IEP are: a)-directing efforts and resources towards overcoming specific developmental problems. b)-obtaining adequate resources to undertake training and research activities c)-providing higher quality training for larger numbers of scientists and technicians d)-producing and publishing greater variety and improved quality for research e)-participating within a network of U.S. (and other international) S&T institutions to maintain quality teaching and research standards</p>	<p>a) Graduate course work and research activities reflect a development orientation b) Stable or increasing recurrent budget allocations b) Level of faculty training b) Level of faculty compensation b) Capital budget sufficient to at least replace as existing physical facilities and support equipment c) Rising graduate student enrollments and completion through Ph.D. c) Higher employment rates for graduates d) Increased research proposals and published studies in "reputed" journals d) Research results utilized by user groups d) Policy promotes and facilities faculty research e) Exchange of faculty students e) Joint research activities</p>	<p>Assumptions for achieving purpose: -Sufficient budget support and/or financial incentives for S&T activities provided by GOP and/or other sources -GOP, NGO's, and private sector teaching and research institutions are able to retain trained faculty and staff</p>

LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Output: 1.S&T training research facilities upgraded 2.Students, faculty, scientists, and technicians trained 3.Administrative system for encouraging, reviewing, and supporting S&T research established 4.Productive linkages between Pakistani and U.S. S&T institutions established	Magnitude of Outputs: -581 persons trained in U.S. and Third Countries -224 workshops and seminars held -Computer and laboratory facilities upgraded -19 S&T research studies developed, financed, and published -PERs evaluation panel established -Nine Pakistan institutions exchanging faculty and staff and coordinating in research projects with U.S. universities -Workshops and seminars for exchanging information		Assumptions for achieving outputs:
Inputs: 1.Technical Assistance -Long-term (PM) -Short-term (PM) 2.Training -Long-term (US) (PM) -Short-term (US/Third Country)(PM) -In-country (PM) 3.Commodity Supprt (\$) . 4.Construction (\$) . 5.Evaluation/Reviews (\$) . 6.Other 7.Inflation/Contingency	Implementation Target (Type and Quantity):		Assumptions for providing inputs:

- DEFINE OBJECTIVES OF THE INSTITUTIONAL IMPROVEMENT:

IDENTIFY REASONABLE INDICATORS OF COST EFFECTIVENESS.

THIS WILL, IN TURN, ENABLE THE DESIGN TO PRIORITIZE THE INSTITUTIONS AND FIELDS OF STUDY CHOSEN. FINALLY, THE DESIGN SHOULD DISCUSS HOW THE PROJECT WILL REDUCE CONSTRAINTS NOW KEEPING CENTERS FOR EXCELLENCE FROM CONTRIBUTING MORE TO SPECIFIC SECTOR DEVELOPMENT OBJECTIVES AND IDENTIFY SPECIFICALLY HOW THE PROJECT WILL CONTRIBUTE TOWARD ALLEVIATING THOSE CONSTRAINTS.

4. IN ADDITION TO THE BASIC DESIGN ISSUES RAISED ABOVE AND IN THE RECENT ANPAC INSTITUTIONAL EXCELLENCE CABLE (REF B), THE PRC DISCUSSED A SERIES OF SPECIFIC ISSUES WHICH WOULD BE OF INTEREST AS THE MISSION MOVES BEYOND THE INSTITUTIONAL EXCELLENCE PID. WE INCLUDE THEM BELOW AS FURTHER ISSUES TO BE ADDRESSED IN THE PROJECT PAPER.

5. EQUITY IMPLICATIONS: THE PID RAISES A NUMBER OF EQUITY QUESTIONS, DIRECTLY AND INDIRECTLY, WHICH NEED TO BE ADDRESSED IN THE DESIGN. ONE QUESTION WHICH SHOULD BE EXAMINED IS THE IMPACT OF THIS PROJECT ON EDUCATIONAL INSTITUTIONS NOT PARTICIPATING IN THE PROJECT. IF THE PROJECT SUCCESSFULLY LEVERAGES GREATER PUBLIC OR PRIVATE RESOURCES INTO SUPPORT OF THE CENTERS OF EXCELLENCE, WILL THIS BE AT THE EXPENSE OF RESOURCES GOING TO PRIMARY OR SECONDARY EDUCATION? WILL EFFORTS IN OUR POLICY DIALOGUE TO PROMOTE GREATER GOP RESOURCES FOR PRIMARY EDUCATION BE UNDERCUT?

SIMILARLY, WILL THOSE HIGHER EDUCATION INSTITUTIONS NOT PARTICIPATING IN THE PROJECT BE DRAINED OF EXISTING TALENT AS STAFF ARE DRAWN TO THE SALARY, TRAINING AND OTHER BENEFITS OF THE PARTICIPATING INSTITUTIONS?

6. SELECTION CRITERIA: FROM THE EXAMPLES GIVEN IN THE PID CABLE, IT APPEARS THAT THE INTENTION IS TO CONCENTRATE ON MANAGEMENT, ENGINEERING, PHYSICAL AND BIOLOGICAL SCIENCES AND ENGLISH LANGUAGE TRAINING. THE SELECTION CRITERIA NEED TO BE EXPLICIT TO ENSURE CONCENTRATION OF THE PROGRAM ON PRIORITY SECTORS. THE PP SHOULD MAKE EXPLICIT CONNECTIONS BETWEEN THE INSTITUTIONS CHOSEN, AID COUNTRY DEVELOPMENT STRATEGY AND PRIORITIES IN THE GOP FIVE YEAR DEVELOPMENT PLAN. FOR EXAMPLE, CAN PARTICIPATING INSTITUTIONS DEMONSTRATE SUPPORT OF BASIC DEVELOPMENT OBJECTIVES? THE PP SHOULD ESTABLISH HOW PARTICULAR SECTORS AND INSTITUTIONS ARE SELECTED AND CLEARLY DEFINE SELECTION CRITERIA AND WHAT WILL BE ACHIEVED.

TO HELP ADDRESS THE ISSUE OF SUSTAINABILITY, THE SELECTION CRITERIA SHOULD EXAMINE THE CANDIDATE INSTITUTIONS' HISTORIES IN RETAINING STAFF, AND INTERNAL POLICIES AFFECTING RETENTION. INSTITUTIONS SHOULD BE CHOSEN ON THE BASIS OF A TRACK RECORD OF SUSTAINABILITY OR BECAUSE OF RECENT INDICATORS WHICH MAKE A STRONG CASE FOR SUSTAINABILITY.

7. SUSTAINABILITY: THE PP SHOULD GO INTO THE DETAILS OF LONG TERM FINANCIAL AND PROFESSIONAL STANDARDS SUSTAINABILITY INCLUDING THE IMPORTANCE OF ONGOING LINKS WITH U.S. INSTITUTIONS. FURTHER, THE DESIGN SHOULD SEEK TO ASSURE MAINTENANCE OF PROJECT FUNDED COMMODITIES OR FACILITIES BEYOND THE LIFE OF THE SUBGRANT. THE PP SHOULD ALSO DISCUSS POTENTIAL GOVERNMENT CONTRIBUTIONS TO UNDERWRITE ONGOING PUBLIC SECTOR CENTERS OF EXCELLENCE COSTS IN LOCAL CURRENCY OR FROM CIP COUNTERPART FLOWS. IN SO FAR AS POSSIBLE, THE PROJECT SHOULD EMPHASIZE DEMAND DRIVEN RESEARCH TO ESTABLISH FUNDING LINKS FOR FUTURE SUPPORT OF THE PARTICIPATING INSTITUTIONS.

8. MECHANISM FOR PROJECT MANAGEMENT: THE PROPOSAL CALLS FOR UP TO DLRS 7.8 MILLION FOR A PRIME CONTRACTOR TO MANAGE THE ADMINISTRATIVE ASPECTS OF THE PROGRAM. IN ADDITION, THE UGC (WITH AID PARTICIPATION) WILL DO THE FINAL SELECTION OF GRANTEEES AND THE MOE WILL PROVIDE POLICY GUIDANCE. IT NEEDS TO BE MADE CLEAR HOW THESE THREE ELEMENTS INTERACT TO INSURE THAT THE POLICY AND

INSTITUTIONAL ISSUES THAT ARE IDENTIFIED WILL BE ADDRESSED. ADDITIONALLY, BECAUSE OF THE COMPLEXITY AND DEPTH OF SKILLS REQUIRED TO ADMINISTER THE PROPOSED PROJECT, A DEFINITION OF THE EXPECTED FORM OF PROJECT MANAGEMENT SHOULD BE GIVEN HIGH PRIORITY IN PROJECT DESIGN.

9. IMPLEMENTATION: PP DESIGN SHOULD DEFINE HOW THE MISSION OR IMPLEMENTING BODY WILL WORK WITH PARTICIPATING INSTITUTIONS TO ASSIST EACH INSTITUTION TO DEVELOP AN OVERALL INSTITUTIONAL DEVELOPMENT PLAN (IF IT DOES NOT ALREADY HAVE ONE) AND A WORK-PLAN FOR PHASED IMPLEMENTATION OF SUBGRANT ACTIVITIES. PLANNING SHOULD IDENTIFY RESOURCES, CHART WHERE THE INSTITUTION IS GOING, AND BE GEARED TO MEASURE IMPACT. SUCH PHASED PLANNING WILL HELP INSURE THAT RESOURCES ARE MADE AVAILABLE IN A TIMELY MANNER, BOTH FROM PROJECT AND NON-PROJECT SOURCES, TO DIRECT RESEARCH TOWARD CERTAIN DEVELOPMENT OBJECTIVES.

10. CONSTRUCTION AND SECTION 611: REFERENCE IS MADE TO SECTION 611 OF THE FAA. AS THE PID PROPOSES (AMONG OTHER DESCRIBED COMPONENTS THAT MAY REQUIRE SECTION 611 PLANNING) A TOTAL OF DLRS 5.1 MILLION IN CONSTRUCTION AND RENOVATION, THE MISSION IS REMINDED OF THE NEED TO DEVELOP REQUISITE PLANS AND COSTS ESTIMATES PRIOR TO

OBLIGATION. PROBLEM CAN BE MINIMIZED IF SIMPLE RENOVATIONS OR DORMITORY CONSTRUCTION IS ALL THAT IS INTENDED. WE SUGGEST PROTOTYPE DESIGNS AND COSTS. IN ANY EVENT, PP WILL NEED TO ADDRESS HOW MISSION WILL MEET 611 REQUIREMENTS.

11. ACHIEVEMENTS AND OUTPUTS: TO THE EXTENT POSSIBLE, THE DESIGN NEEDS TO IDENTIFY WHAT, SPECIFICALLY, WILL BE ACHIEVED IN EACH MAJOR AREA OF ACTIVITY (I.E. ADVANCED TRAINING, FACULTY EXCHANGE AND JOINT RESEARCH WITH U.S. INSTITUTIONS, CONFERENCES AND SEMINARS, AND CONSTRUCTION). INDICATORS OF SUCCESS NEED TO BE IDENTIFIED AND MEASURABLE. ECONOMIC AND MARKET FACTORS MAY PROVIDE SOME INDICATORS OF SUCCESS, AS THE GRADUATES AND RESEARCH WHICH ARE PRODUCED WILL PRESUMABLY FIND A MARKET. THE NUMBER AND EMPLOYMENT EXPERIENCES OF GRADUATES AND THE VOLUME OF RESEARCH AND CONSULTANCIES FUNDED BY THE PRIVATE SECTOR MAY SERVE AS INDICATORS OF THE VALUE OF THE OUTPUT.

12. UPON MISSION REQUEST, BUREAU PERSONNEL ARE AVAILABLE TO ASSIST WITH THE PROJECT ON A TDY BASIS.

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5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes criteria applicable to all projects. Part B applies to projects funded from specific sources only: B(1) applies to all projects funded with Development Assistance; B(2) applies to projects funded with Development Assistance loans; and B(3) applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

Yes
Yes

A. GENERAL CRITERIA FOR PROJECT

1. FY 1989 Appropriations Act Sec. 523; FAA Sec. 634A. If money is sought to obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified?
Yes

2. FAA Sec. 611(a)(1). Prior to an obligation in excess of \$500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?
Yes

3. FAA Sec. 611(a)(2). If legislative action is required within recipient country, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance?
No further legislative action is required.

4. FAA Sec. 611(b); FY 1989 Appropriations Act Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.)
- N/A
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively?
- Yes, Mission Director's 611 (e) Certification is included in PP.
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.
- N/A
7. FAA Sec. 601(a). Information and conclusions on whether projects will encourage efforts of the country to:
- (a) increase the flow of international trade;
 - (b) foster private initiative and competition;
 - (c) encourage development and use of cooperatives, credit unions, and savings and loan associations;
 - (d) discourage monopolistic practices;
 - (e) improve technical efficiency of industry, agriculture and commerce; and
 - (f) strengthen free labor unions.
- (a) No
(b) Yes, private laborator^{ies} will be eligible for Small Grants.
(c) No
(d) No
(e) One of the objectives of the project is to promote technologies adapted to a Pakistan specific context.
(f) No
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
- IEP will be financing commodities and perhaps generating future markets for those commodities.

9. FAA Secs. 612(b), 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars. This project is financed by ESF funds.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? Pakistan was removed from the "Near-Excess Currency" list at the end of FY 88.
11. FY 1989 Appropriations Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? N/A
12. FY 1989 Appropriations Act Sec. 549. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel? No
13. FAA Sec. 119(q)(4)-(6) & (10). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other (a) Yes
(b) No

wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas?

(c) Yes
(d) No

14. FAA Sec. 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)? N/A
15. FY 1989 Appropriations Act. If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government? N/A
16. FY 1989 Appropriations Act Sec. 538. If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.? N/A
17. FY 1989 Appropriations Act Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has prior approval of the Appropriations Committees of Congress been obtained? N/A
18. State Authorization Sec. 139 (as interpreted by conference report). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision). This procedure will be followed.

B. FUNDING CRITERIA FOR PROJECT**1. Development Assistance Project Criteria**

This is ESF Project.

- a. FY 1989 Appropriations Act Sec. 548
(as interpreted by conference report for original enactment). If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities (a) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (b) in support of research that is intended primarily to benefit U.S. producers?

N/A

- b. FAA Secs. 102(b), 111, 113, 281(a).
Describe extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental

N/A

institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.

- c. FAA Secs. 103, 103A, 104, 105, 106, 120-21; FY 1989 Appropriations Act (Development Fund for Africa). Does the project fit the criteria for the source of funds (functional account) being used? N/A
- d. FAA Sec. 107. Is emphasis placed on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? N/A
- e. FAA Secs. 110, 124(d). Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)? N/A
- f. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority? N/A

- g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.
- IEP is a project which will strengthen select institutions of higher education in the areas of science and technology.
- h. FY 1989 Appropriations Act Sec. 536. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions?
- No
- Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilizations?
- No
- Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?
- No
- i. FY 1989 Appropriations Act. Is the assistance being made available to any organization or program which has been determined to support or participate in the management of a program of coercive abortion or involuntary sterilization?
- No
- If assistance is from the population functional account, are any of the funds to be made available to voluntary family planning projects which do not offer, either directly or through referral to or information about access to, a broad range of family planning methods and services?
- N/A

- j. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes
- k. FY 1989 Appropriations Act. What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)? N/A
- l. FAA Sec. 118(c). Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (a) stress the importance of conserving and sustainably managing forest resources; (b) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (c) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (d) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (e) help conserve forests which have not yet been degraded by helping to increase N/A

production on lands already cleared or degraded; (f) conserve forested watersheds and rehabilitate those which have been deforested; (g) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (h) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (i) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (j) seek to increase the awareness of U.S. government agencies and other donors of the immediate and long-term value of tropical forests; and (k) utilize the resources and abilities of all relevant U.S. government agencies?

- m. FAA Sec. 118(c)(13). If the assistance will support a program or project significantly affecting tropical forests (including projects involving the planting of exotic plant species), will the program or project (a) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and (b) take full account of the environmental impacts of the proposed activities on biological diversity?

N/A

- n. FAA Sec. 118(c)(14). Will assistance be used for (a) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (b) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas? N/A
- o. FAA Sec. 118(c)(15). Will assistance be used for (a) activities which would result in the conversion of forest lands to the rearing of livestock; (b) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands; (c) the colonization of forest lands; or (d) the construction of dams or other water control structures which flood relatively undegraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development? N/A
- p. FY 1989 Appropriations Act. If assistance will come from the Sub-Saharan Africa DA account, is it (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) being provided in accordance with the policies contained in section 102 of the FAA; N/A

(c) being provided, when consistent with the objectives of such assistance, through African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa;

(d) being used to help overcome shorter-term constraints to long-term development, to promote reform of sectoral economic policies, to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities, to bring about appropriate sectoral restructuring of the Sub-Saharan African economies, to support reform in public administration and finances and to establish a favorable environment for individual enterprise and self-sustaining development, and to take into account, in assisted policy reforms, the need to protect vulnerable groups;

(e) being used to increase agricultural production in ways that protect and restore the natural resource base, especially food production, to maintain and improve basic transportation and communication networks, to maintain and restore the renewable natural resource base in ways that increase agricultural production, to improve health conditions with special emphasis on meeting the health needs of mothers and children, including the establishment of self-sustaining primary health care systems that give priority to preventive care, to provide increased access to voluntary family planning services, to improve basic literacy and mathematics especially to those outside the formal educational system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas?

9. FY 1989 Appropriations Act Sec. 515. If deob/recb authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same general region as originally obligated, and have the Appropriations Committees of both Houses of Congress been properly notified?

N/A

2. Development Assistance Project Criteria (Loans Only)

- a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan at a reasonable rate of interest.

N/A

- b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest?

N/A

- c. FAA Sec. 122(b). Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities?

N/A

3. Economic Support Fund Project Criteria

- a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA? (a) Yes
(b) Yes
- b. FAA Sec. 531(e). Will this assistance be used for military or paramilitary purposes? No
- c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? N/A

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. PROCUREMENT

1. FAA Sec. 602(a). Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes
2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or determined under delegation from him? Yes
3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? Pakistan does not discriminate
4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) N/A

5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.) No
6. FAA Sec. 603. Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates? Shipping will comply with said requirement.
7. FAA Sec. 621(a). If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? Will the facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? Yes
No PASA/PASAs are contemplated.
8. International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? Yes
9. FY 1989 Appropriations Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? All direct AID contracts will so provide.

10. FY 1989 Appropriations Act Sec. 524. If assistance is for consulting service through procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)?
- Yes

B. CONSTRUCTION

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used?
- No
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?
- Yes
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million (except for productive enterprises in Egypt that were described in the CP), or does assistance have the express approval of Congress?
- N/A

C. OTHER RESTRICTIONS

1. FAA Sec. 122(b). If development loan repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter?
- N/A
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?
- N/A

3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? Yes
4. Will arrangements preclude use of financing:
- a. FAA Sec. 104(f); FY 1989 Appropriations Act Secs. 525, 536.
- (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (1) Yes
- (2) To pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (2) Yes
- (3) To pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; or (3) Yes
- (4) To lobby for abortion? (4) Yes
- b. FAA Sec. 483. To make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? Yes
- c. FAA Sec. 620(g). To compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President? Yes
- d. FAA Sec. 660. To provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes
- e. FAA Sec. 662. For CIA activities? Yes

- f. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? Yes
- g. FY 1989 Appropriations Act Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for prior or current military personnel? Yes
- h. FY 1989 Appropriations Act Sec. 505. To pay U.N. assessments, arrearages or dues? Yes
- i. FY 1989 Appropriations Act Sec. 506. To carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)? Yes
- j. FY 1989 Appropriations Act Sec. 510. To finance the export of nuclear equipment, fuel, or technology? Yes
- k. FY 1989 Appropriations Act Sec. 511. For the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? Yes
- l. FY 1989 Appropriations Act Sec. 516; State Authorization Sec. 109. To be used for publicity or propaganda purposes designed to support or defeat legislation pending before Congress, to influence in any way the outcome of a political election in the United States, or for any publicity or propaganda purposes not authorized by Congress? Yes
5. FY 1989 Appropriations Act Sec. 584. Will any A.I.D. contract and solicitation, and subcontract entered into under such contract, include a clause requiring that U.S. marine insurance companies have a fair opportunity to bid for marine insurance when such insurance is necessary or appropriate? Yes



Telegram: ECONOMIC
Telex: ECDIV No. 05-634

SECRETARY
PHONE: 820629

Annex 12

No. 1(2)US-1/88.

Government of Pakistan
MINISTRY OF FINANCE AND
ECONOMIC AFFAIRS
(ECONOMIC AFFAIRS DIVISION)

Islamabad, the 1st June 1988

INSTITUTIONAL EXCELLENCE PROJECT -391-0498

Dear Mr. Norris,

As part of the economic assistance program between our two Governments, the Government of Pakistan formally requests United States assistance in the amount of an eighty million dollars (\$80,000,000) grant, subject to the availability of funds, to finance the Institutional Excellence Project (IEP).

IEP will support the Government of Pakistan's efforts to improve the quality of education in the disciplines of science and technology at the university level. IEP will improve and strengthen selected academic and research institutions concerned with the economic and social development of Pakistan, through financial support for technical assistance, training, commodities, research and minor renovation of existing facilities.

With best regards,

Yours sincerely,

(IZHARUL HAQUE

Mr. James Norris,
Director,
USAID Mission,
ISLAMABAD.

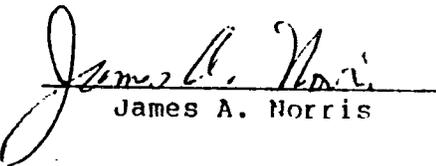
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable: USAIDPAK

HEADQUARTERS OFFICE
ISLAMABADINSTITUTIONAL EXCELLENCE PROJECT (391-0498)FAA Section 611 (e) Certification

I, James A. Norris, the principal officer of the Agency for International Development in the Islamic Republic of Pakistan, having taken into account, among other things, the maintenance and utilization of projects in the Islamic Republic of Pakistan, previously financed or assisted by the United States, do hereby certify, pursuant to Section 611(e) of the Foreign Assistance Act of 1961, as amended, that, in my judgment, the Islamic Republic of Pakistan has both the financial capability and the human resources capability effectively to implement, utilize and maintain the proposed Institutional Excellence Project.

This judgment is based upon the project analysis as detailed in Institutional Excellence Project and is subject to the conditions imposed herein.


James A. Norris


Date