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# **INSTITUTIONAL EXCELLENCE PROJECT**

**Final Report**

*Submitted*

*To*

**United States Agency for International Development  
Islamabad**

*By*

**EDC (Pvt) Limited**  
Enterprise & Development Consulting

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Our special thanks are due to Ms. Amna W. Mir, IEP Project Officer, USAID, who's unending support, cooperation and advice proved a source of constant encouragement and guidance throughout and enabled us to successfully complete the assignment.

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Particular thanks are also due to Mr. Muneer Ahmed, Joint Educational Advisor, MOE, who contributed significantly towards the success of the project.

We appreciate the contribution of Mr. Iftikhar Malik, Acting President, FPCCI, Mr. M. Rafiq Khan, Acting Secretary General, FPCCI and Mr. Aftab Akhtar, Economic Advisor, FPCCI, towards the sustainability of the project.

Thanks are also due to the delegates of the Research Institutions and their respective Industrial counterparts who provided the material which formed the basis of deliberations, discussions and recommendations. We gratefully acknowledge their efforts and to all we express our appreciation.

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To all others who helped in their own special way we would like to express our thanks.

Last but not least we express our gratitude to Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister for gracing the inaugural session of the USAID-IEP conference, addressing the delegates and expressing her willingness to arrange all possible assistance for the sustainability of the concept.

## LIST OF ABBREVIATIONS

CEMB	CENTER OF EXCELLENCE IN MOLECULAR BIOLOGY
CO-P.I	CO-PRINCIPAL INVESTIGATOR(s)
FPCCI	FEDERATION OF PAKISTAN CHAMBERS OF COMMERCE & INDUSTRIES
GOP	GOVERNMENT OF PAKISTAN
HEJ	HUSEIN EBRAHIM JAMAL RESEARCH INSTITUTE OF CHEMISTRY
IEP	INSTITUTIONAL EXCELLENCE PROJECT
JEA (P&D)	JOINT EDUCATIONAL ADVISOR, PLANNING & DEVELOPMENT
KGC	KHAWAJA GLASS COMPANY
MOE	MINISTRY OF EDUCATION
MOU(s)	MEMORANDA OF UNDERSTANDING
NCEG	NATIONAL CENTER OF EXCELLENCE IN GEOLOGY
OGDC	OIL & GAS DEVELOPMENT CORPORATION OF PAKISTAN
P.I	PRINCIPAL INVESTIGATOR(s)
PCSIR	PAKISTAN COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH
QAU	QUAID-I-AZAM UNIVERSITY
R.I	RESEARCH INSTITUTION(s)
STEDEC	SCIENTIFIC & TECHNOLOGICAL DEVELOPMENT CORPORATION OF PAKISTAN
UET	UNIVERSITY OF ENGINEERING & TECHNOLOGY
UGC	UNIVERSITY GRANTS COMMISSION
W.T.,UGC	MEMBER WHOLE TIME UGC

## **EXECUTIVE SUMMARY**

**This report covers consultant activities for the Institutional Excellence Project (IEP) during the period: October 1993 to February 1994. It also includes a brief historical background of IEP and the status of the project as it was at the beginning of the reporting period.**

**Before this assignment was entrusted to EDC, the research institutions (RIs) and their respective industrial counterparts had been selected and MOU(s) signed. Initial funds in accordance with the approved budgets had been provided to the principal investigators (PIs). Provision of commodities, as specified by the PI(s), was underway and many of these had been delivered.**

**All the 16 projects were in operation with varying rates of progress. The progress in all cases was being hampered due to several reasons including delay in supply of remaining commodities and insufficient communication/coordination between all the interacting parties. The impediments were removed through enhanced co-ordination/communication and regular visits.**

**A 2 days national workshop in November 1993 and a one day conference in February 1994 were held for enhancement of IEP concept and dissemination of project results. Through these efforts all the objectives of IEP were successfully realized.**

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**INSTITUTIONAL EXCELLENCE PROJECT (IEP)  
AT A GLANCE**

Research Institution	Counter-parts	Number of Projects	Total Amount of Funding \$	Title
NCEG, Peshawar	Khawaja Glass Co.  OGDC	Four	289,576	1. Identification & Characterization of Quality of Silica Sand Resources for Glass Making: 2. Inclusion Studies of Sheet Glass: 3. Review of Analytical Processes at Khawaja Glass Company: 4. Sedimentological Studies in Potential Hydrocarbon-bearing Strata:
QAU, Islamabad	Bio-Tech Ciba Giegy, Multan	Two	150,559	1. Bating Enzymes from Animal Sources: 2. Bioinsecticides in the Control of Insect Pests of Cotton:
UET, Lahore	Descon  Escorts  Multiline	Three	106,274	1. Microprocessor based Multimetering, Energy & Tariff Meter: 2. Design & Development of an Expert Logic Controller: 3. Uninterrupted Power Supply (UPS):
CEMB, Lahore	Ciba Giegy, Lahore  Punjab Drug House	Two	208,600	1. Microbial Control of Insect Pests in Cotton: 2. Hormone Receptors as Prognostic Factors in Health & Disease:
Gomal, D.I.Khan	PCSIR & STEDEC	Two	150,300	1. Commercial Exploitation of Taxol Anti-Cancer Drug: 2. Commercial Exploitation of Azadirachtin:
HEJ, Karachi	Hamdard Labs.  Ehsanullah Labs. & A.K. Labs.	Three	220,120	1. Investigation of Medicinal Plants for Anti-diabetic Activity: 2. Development and Pilot Plant Production of Medical Diagnostic Kits. 3. Bating Enzymes from Animal Sources:
<b>Grand Total</b>				
6	14	16	1,125,429	

## **ACHIEVEMENTS OF IEP**

The measurable achievements of IEP may be enumerated as:

- . Improved physical capabilities of participating research institutions to engage in industrial cooperative research.
- . Trained skilled manpower.
- . Established the credibility of the research sector in the eyes of private sector for having the ability to solve problems and provide innovative but practical solutions to the industrial problems.
- . Initiated two way communication between the research sector and the private sector counterparts.
- . Focused the attention of research sector on production of commercial products or processes.
- . Highlighted the importance and benefits of cooperative work with private sector companies.
- . Learned through experimentation the problems associated with such cooperative applied research work and their plausible solutions.
- . Provided a model for a sustainable system for continuation of industry/university applied research cooperation using IEP structure.
- . Provided an operational manual to serve as a guide and reference for all such future activities.
- . Provided practical recommendation/suggestions to the Government of Pakistan based on the considered view of all the participant of the final conference for encouraging such cooperative applied research activity.
- . Achieved a commitment from FPCCI, representative body of the private-sector, to take the initiative in sustaining such cooperative applied research activity.
- . Obtained an assurance from the Government of Pakistan to take measures for enhancing such cooperative applied research activity.
- . Achieved a success rate of more than 80% with respect to achievement of objectives. It is expected that by the end of IEP thirteen out of the total sixteen projects initiated under the USAID-IEP will be successfully completed.

## **HISTORICAL**

### **Background**

The Institutional Excellence Project (IEP) was originally envisaged as a ten year, \$80 million project to identify and strengthen selected university departments and centers identified as important to future economic development of Pakistan. One of the major goals of the project was to prepare each of the units to interact productively with industry, primarily in the private sector, and to introduce indigenous and new economically important technology. In the initial stages of the project, all the potential departments and centers were visited/identified and assessments of their then existing status and future needs were begun.

With the imposition of Pressler restrictions in spring, 1991, both the time frame and the budget of the project was sharply reduced to less than 10% of that originally envisaged. Hence the useful units of the project were limited to the completion of the assessments. The most important element in the assessments which remained was the potential for successful interaction of the selected departments with industry. In the initial assessments, a variety of factors were perceived as existing obstacles to successful interaction. To test these perceptions and assess capabilities, a set of practical projects, each with defined commercial goals established by industry, were conceived and implemented.

### **Objectives**

The major goals of the existing project have been:-

- To prepare each of the participating units to interact productively with industry, primarily in the private sector.
- To strengthen their research capabilities so that they can provide effective technical assistance and advice to Pakistani industries.
- To introduce indigenous and new economically important technology through research by universities and other research institutions of Pakistan.
- To establish the credibility of the research institutions and centers for carrying out applied research.

At an early stage of the project, the research institutions and centers were identified and partial assessments were conducted to determine how best their research capabilities could be strengthened and how they could provide technical assistance and advice to Pakistani industries. The assessments focused upon applied research and technology, and technology transfer from the research institutions to indigenous Pakistani industries.

## **Approach**

To test the capability of research institutions and centers to provide solutions to industrial problems and the effectiveness of their interaction with industry, cooperative applied research projects were established between industrial companies and selected research institutions and centers. The industries identified problems for which solutions were needed for immediate application to their industrial processes. The projects were based on proposals jointly developed between the cooperating industries and the research institutions and centers selected for supporting the technology transfer.

To assist in the implementation of the project, a Pakistani consulting firm was employed. They were to provide continuous assistance in identifying and facilitating cooperative arrangements with companies, monitoring of research activities, analysis of the economic importance of results, and presentation of final project results to the Pakistani community. The contract with the firm came to an end in early 1993. Since the intent was to continue the support services to these projects in a similar manner in the coming year beyond the level where the projects stood at the time a new contracting firm was employed. The new contract was negotiated with EDC for continuation of monitoring activities with major emphasis on organization of a workshop and a conference for the presentation of final project results to the Pakistani community and facilitating in the institutionalization of the concept.

## **Summary of Previous Activity**

Beginning in May and June, 1992, sixteen projects were initiated between six university departments and centers with fourteen cooperating industrial companies, all but two of which were in the private sector. The process of implementing the project included identification of potential applied research areas for each department/center; identification of cooperating companies and appropriate goals for each project; preparation of proposals outlining work plans, commodity needs and budgets to achieve the goals; detailed discussions with the participating companies and final agreements on project details. Projects were funded through Memoranda of Understanding signed in May and June, 1992, and initial work on projects was begun.

## **Summary of Description & Status of Projects**

Although there was diversity in the subjects and a variety of different products were to be developed (Annexure 1), there were three common features shared by all the research projects:

- They all had great promise of economic benefits,
- The products were envisaged to be developed within the stipulated time frame,
- The results obtained would have immediate applicable value.

Review of the status of all the projects revealed that all the sixteen projects were functioning but with varying rates of progress. The progress in all cases was observed to be less than satisfactory and was being seriously hampered due to many problems (Annexure 2). This slow progress in the research activities was attributed, amongst other problems to the transient discontinuity of the consulting services that had occurred at the time.

An examination of the delay in commodities delivery revealed that a large number of items had already arrived at USAID/Karachi, but had not been distributed because of various reasons including lack of proper coordination and because of a shortage of warehouse personnel. Efforts for prompt delivery of the undelivered commodities, were immediately started with the consent and the cooperation of USAID. Through the efforts of the IEP Project Officer assisted by EDC, an HRD representative was dispatched to Karachi to expedite deliveries. This procedure was also followed as necessary for future items.

Initial meetings of EDC representatives with the industrial counterparts revealed that for most projects, completeness and promptness of submission of written quarterly progress reports had been disappointing, even after emphatic requests for submittal.

A substantial number of company management representatives, strongly urged more extensive contact both written and in person, not only with technical staff, but with managing officers of the company.

A crucially important requirement for successful completion of IEP was realized to be an organized and through contact of Principal Investigators with both technical and managerial personnel of cooperating companies. Reaction of the latter group to project results and their enthusiastic participation in the final project conference, to a large degree, was to determine the sustainability of the IEP concept in encouraging additional industry support for applied research. EDC representatives took responsibility for monitoring and facilitating this contact.

## SUMMARY OF ACTIVITIES

EDC's work on USAID-IEP commenced by detailed discussions with Ms. Amna Mir, IEP Project Officer, USAID and Dr. J.J. Monagle, consultant, USAID. Through these discussions the targets to be achieved were clearly defined, the activities to be performed and the approach to be adopted for achieving these objectives was also decided.

As a first step in this regards EDC representatives visited all the R.I(s) and their respective industrial counterparts. The visit proved extremely useful and while it enhanced the confidence of all the participants in IEP it also brought to light a variety of problems being faced by all the parties involved in the project. Solutions for a great many of them were found through discussions on the spot, but some problems necessitated consultation with the Project Officer. Continued help and assistance was assured to all the participants. At the end of these visits the Project Officer was briefed and a detailed report of the same was submitted (Annexure 3).

To expedite removal of difficulties another visit was immediately made to some of the R.I(s) by Project Officer, USAID consultant and EDC consultant. This trip also proved extremely useful and not only the P.I.s felt reassured, but it also facilitated the removal of some more of their problems.

This was followed by conducting a two days workshop at Holiday Inn Hotel, Islamabad, on the 8th & 9th of November 1993. The principal objectives of this workshop were to advance the concept of IEP by enhancing the confidence of all the participants through a collective dialogue and to evaluate the overall degree of success of the project mid-way through its course.

The workshop proved very successful and all the objectives set forth for the workshop were fully, accomplished. A detailed report of the workshop was submitted to the Project Officer (Annexure 4).

EDC, thereafter, participated in the IEP progress implementation review (PIR) meeting with USAID. The EDC consultant briefed the participants of PIR meeting and participated in the discussions which followed (Annexure 5). The discussions included an overall assessment of the project with respect to the progress made, the problems encountered and their possible solutions and the future activities.

Another monitoring and evaluation visit to all the R.I(s) & their respective industrial counterparts was made again by EDC representatives towards the end of December 1993. This visit also proved very useful and it emerged that the relationship between the R.I(s) and their respective industrial counterparts had improved significantly as compared to the situation in October, 1993. This success was largely attributed to the increased level of coordination and communication between the two parties through the efforts of EDC. At the end of these visits the Project Officer was briefed again and a detailed report of the same was submitted (Annexure 6).

Satisfied with the increased rate of progress of the various research projects achieved through facilitating and coordinating efforts of EDC and constant encouragement of Project Officer, attention was focused on the institutionalization of the concept. As a first step in this regards

EDC was advised to prepare a brief for general circulation to various government departments, universities/research institutions, donor agencies and members of FPCCI, and particularly to Ministry of Education (MOE) & UGC. The same was submitted (Annexure 7) and in addition meetings were held with Mr. Munir Ahmad, JEA (P&D), MOE and Dr. M.H. Qazi, member (W.T) UGC to further elaborate on the lessons learnt through the experience of IEP and ensure their continued support.

As a result of these efforts interest in USAID-IEP increased and desire was expressed that another monitoring and evaluation visit may be arranged to enable the JEA to obtain first hand information on the progress of these projects. The same was organized and a 3rd monitoring and evaluation visit was made towards the end of January 1994. The visit again proved very useful and it emerged as a consensus view that significant progress has been made in all the research projects. It was observed that 12 out of the total 16 research projects were rapidly nearing completion. At the end of these visits a detailed report of the same was again provided to Project Officer (Annexure 8).

Encouraged by the results of these monitoring and evaluation visits the J.E.A assured all possible assistance and cooperated in arranging meetings with Mr. M. Usmani, Secretary Education and Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister. Assurance of participation in the conference and their continued support thereafter were achieved through these briefings.

To institutionalize the concept of cooperative applied research a one day national conference on Public-Private Partnership in Technology Development: Emerging Linkages Between Industry and Research Institutions was held at Marriott Hotel, Islamabad on the 12th of February 1994. The conference was attended by more than a 150 delegates from various universities/research institutions, industry, several Government ministries/departments, FPCCI and donor agencies.

The delegates were addressed by Prof. Pareshan Khatak, Chairman, UGC, Mr. Arnold Radi, Chief, Office of Development Resources, USAID, Mr. Munir Ahmed, JEA, Ministry of Education, Mr. Iftikhar Malik, Acting President FPCCI, and Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister.

The conference proved to be very successful and all the objectives set forth for the conference fully accomplished. A detailed report of the conference was submitted to the Project Officer (Annexure 9).

A memo of recommendations to be submitted to the Government of Pakistan for its favorable consideration was approved by the participants of the conference (Annexure 10). The same has been submitted by USAID to Mr. Munir Ahmed JEA (P&D) for his necessary action and onward submission to the Government of Pakistan through proper channel.

EDC submitted a draft manual "Sustainable Public - Private Partnership for Indigenous Technology Development" to USAID. This draft manual was revised by USAID and final version was produced (Annexure 11).

The conference was followed by a press release by FPCCI in which it was clearly expressed that FPCCI would take an initiative in supporting and encouraging cooperative applied research activities (Annexure 12). This may be seen as a major step forward in the direction of sustainability of the concept of USAID-IEP.

**SUBJECT-WISE CLASSIFICATION  
OF PRODUCTS**

**1. ENZYMES FOR LEATHER PROCESSING**

**2. BIO-INSECTICIDES**

**3. BIO-MEDICAL PRODUCTS**

**4. ELECTRONIC PRODUCTS**

**5. GEOLOGY**

- **GLASS PRODUCTION**

- **PETROLEUM EXPLORATION**

## **LIST OF PROBLEMS**

### **WHICH EMERGED DURING USAID-IEP**

We would like to mention that most of the problems listed below had been solved with the joint efforts of all the project participants. These problems are being listed for future reference by the participants of any similar initiatives.

#### **IE PROJECT PROBLEMS**

- Progress Reports (Frequency and Completeness) were unsatisfactory.
- Contact with industrial counterparts/level of contacts/reports/frequency was not adequate.
- High priority to project activities was not given by the administrators.
- Timeliness of projects, scheduling and completion needed improvement.
- Financial management sometimes caused constraint.

#### **USAID PROBLEMS**

- Slow processing of Memoranda of Understanding (MOU).
- Late Delivery of commodities.
- Incomplete delivery of commodities.
- Improper packing of sensitive items.
- Interruption of consultant service.

#### **USAID/UNIVERSITY PROBLEMS**

- Slow determination of commodity specifications.
- Inadequate understanding of USAID rules/operating procedures.

#### **INDUSTRY PROBLEMS**

- Confidence level less than desired.
- Intellectual rights not assured.
- Timeliness not given a priority.

# **INSTITUTIONAL EXCELLENCE PROJECT**

## **Project Monitoring & Evaluation Report**

Number: 1

*Submitted*

*To*

**United States Agency for International Development  
Islamabad**

**By**

**EDC (Pvt) Limited**  
Enterprise & Development Consulting

**Authors: Dr. Salman A. Malik  
Mr. Assad Bukhari**

**Date:** Oct 17, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** National Centre of Excellence in Geology (NCEG); University of Peshawar, Peshawar.

**Participants:**

**EDC**

Mr. Assad A. Bukhari Project Manager

Dr. Salman A. Malik Consultant

**NCEG**

Dr. Qasim Jan Director & Principal Investigator

Dr. Tahir Shah Assistant Professor & Co-Principal Investigator

Dr. Iftikhar Abbasi Assistant Professor & Co-Principal Investigator

Mr. M. Raiz Research Associate

**Objectives:**

- Evaluation of progress.
- Identification of problems.
- Provide Guidance/Assistance in Completion of Questionnaire/Progress reports.

**Summary:**

Progress of the four USAID-IEP projects was discussed in detail. Dr. Qasim Jan opened the discussion with general remarks followed by the details of individual projects. Each project was discussed at length including the progress made; the problems being encountered and their possible solutions. He hoped to complete the projects within the earlier stipulated time. He provided a copy of the latest progress report and assured that he would send the completed questionnaire within two days time.

**Progress:**

**Project 1**                    **Identification & Characterization of Quality of Silica Sand Resources for Glass Making:**

As stated in the recently submitted report dated 2/10/93, some analysis have been completed while others are under way.

Sampling from earlier suggested areas like Chashma to be carried out and the results to be provided at a later date.

**Project 2**                    **Inclusion Studies of sheet Glass:**

As stated in their latest report dated 2-10-1993, Dr. Qasim Jan reported that due to damage to one of the required instruments and lack of sample material little progress could be made. He however confirmed that now sufficient sample material has been made available and preliminary work regarding its study has been completed. Bulk analysis of the samples are under way, micro thin sections of the sample material have been cut and mounted on the slides. The results are awaited and would be provided at a later date.

**Project 3**                    **Review of Analytical Processes at Khawaja Glass Company:**

As stated in the recently submitted report dated 2/10/93. The reported results have to be implemented and verification regarding their reproducibility is still to be evaluated.

**Project 4**                    **Sedimentological Studies in Potential Hydrocarbon bearing Strata:**

The project has been completed recently. Final report comprises of 87 pages along with its enclosures. The report has been submitted to USAID-IEP office and the industrial counter part i.e. OGDC.

**Related Information:**

**Meetings of faculty/industrial staff:**

- No meetings (other than the earlier reported).

**Problems encountered/reported:**

- Late delivery of commodities including sample material and equipment.
- Ignorance/Indifference on part of the industrial counterpart.
- Accidental Damage to existing equipment and delayed arrangement for its repair.
- Delayed response from all quarters.

**Suggestions/Recommendations:**

- Timely supply of Commodities.
- Industries to be selected with consultation.
- Expeditious action/reply.
- More intensive/communication/coordination.
- Personal incentive for all personnel involved in research at the institution.

**EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of Dec, 1993.

It is regretted that inspite of an arrangement to meet Mr. Tahir Jamal of Khawaja Glass Company Hasan-Abdal, he was not non available and no information regarding his availability could be provided by the company. Neither any person at the company was conversant with the progress made so far nor was any one willing/authorized to make any comment on the subject. Their view of the projects could not therefore be obtained.

No Problems were reported regarding project No. 4, which has been successfully completed.

**Date:** Oct 19, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Chemistry, Gomal University, Dera Ismail Khan.

**Participants:**

**EDC**

Mr. Assad A. Bukhari      Project Manager

Dr. Salman A. Malik      Consultant

**Gomal University**

Dr. G. A. Miana      Professor & Principal Investigator.

**Objectives:**

- Evaluation of Progress.
- Identification of Problems.
- Provide Guidance/Assistance in completion of Questionnaire/progress reports.

**Summary:**

Progress of the two USAID-IEP projects was discussed in detail. The discussion was opened by Mr. Assad A. Bukhari who outlined the objectives of the visit. The detailed discussion of the projects followed. Both projects were discussed at length including the progress made so far, the problems encountered and their possible solutions. For a better understanding/appreciation of the problems being faced, Dr. G. A. Miana gave EDC representatives a guided tour of the labs and showed the equipment provided.

**Progress:**

**Project 1**

**Commercial Exploitation of Taxol Anti-Cancer Drug:**

It was reported that leaves of Taxus baccata collected from Nathia Gali had been extracted with various solvents and the extract tested for the presence of Taxol. No Taxol could be detected and further progress is being hampered due to non availability of (a) standard Taxol. (b) bark of Taxus baccata (c) industrial counterpart.

## **Project 2**

### **Commercial Exploitation of Azadirachtin:**

As stated in their previous report, Azadirachtin has been extracted using a variety of solvents. It is reported to show potency in all cases. Bulk extraction is to be done now, whereafter large scale field trials may be made. Concurrently evaluation of its half-life in various extracts under field conditions and economically viable methods of extraction/mode of packing & spraying would be evaluated. Most of the work may be completed within the stipulated time provided financial support for bulk buying is extended expeditiously.

#### **Related Information:**

##### **Meetings of faculty/industrial staff:**

- Frequent, as and when ever needed, no regular pattern.

##### **Problems encountered/reported:**

- Late delivery of commodities.
- Equipment still not functional because of lack of certain elements and also printed matter/information booklet.
- Shortage of funds to buy bulk materials.
- Difficulty in obtaining bark from live trees.

##### **Suggestions/Recommendations:**

- Expedite provision of missing pieces of equipment.
- Provide assembly/operation manuals on priority.
- Release of funds for bulk purchase.

#### **EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of December 1993.

The collaborating industrial counterparts for project No. 2 (Azadirachtin) were STEDEC and "PCSIR" Laboratories Lahore, which were contacted later on 24-10-1993. Present at PCSIR were Dr. Mushtaq, Dr. Majid and Dr. Tanveer and at STEDEC was Mr. Mukhtar Ahmad Chaudhry. At both places the response was encouraging and they were eagerly awaiting the commodities to be supplied to them.

It was understood that PCSIR Labs. would help Gomal University in bulk extractions which may not be accomplished in full in the given time at Gomal University. They would also test the extract in the field and provide field results.

STEDEC would thereafter do the pre-marketing survey/ evaluation and in accordance with the economic and potency considerations market it in a finished product condition.

**Date:** Oct 20, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Biological Sciences, Quaid-i-Azam University, Islamabad.  
**Participants:**

**EDC**

Dr. Salman A. Malik            Consultant

**QAU**

Dr. Abdul Hameed            Assistant Professor & Principal Investigator

**BIOTECHNOLOGY LTD PAKISTAN**

Amir Qazi                      Technical Director

**Objectives:**

- Evaluation of progress.
- Identification of problems.
- Possible guideline/assistance in completion of the Questionnaire/Progress reports.

**Progress:**

**Project 1**                      **Bating Enzymes from Animal sources:**

The progress of the project was discussed. It was reported that the project on the whole has gone rather well. All the lab. scale work has been completed and the methodology perfected. The fermentor for large scale production is being installed and hopefully would be commissioned in the near future. Whereafter subject to supply of necessary commodities & glass ware, production would be immediately started and the product supplied to the counterparts for evaluation of activity under industrial conditions. Concurrently the technique for maximum efficiency/production of the enzymes would be perfected for bulk production. Other than the logistic and installational delays and supply of commodities no other technical problems were foreseen. The progress has been hampered earlier due to late supply of the fermentor and now due to its relatively slow installation and lack of chemicals & glass ware.

**Related information:**

Meetings of faculty/industrial staff:

- Regular/Frequent, on the average once a week.

Problems encountered/reported:

- Late delivery of commodities.
- Delay in installation of the fermentor.
- Chemicals/glass ware still awaited.

**EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of December 1993.

The progress of the 2nd project at QAU namely "Bioinsecticides in the control of insect pests of cotton" could not be evaluated as the status of Dr. Khalida who is now looking after the project as the Principal Investigator has not been clearly determined by the university. Dr. Khalida did report that progress has been made but since her status is not clear she would not like to discuss the issues in detail at the moment. She was however informed that every effort has to be made to complete the research work by the end of December 1993.

**Date:** Oct 23, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Centre of Excellence in Molecular Biology, University of the Punjab, Lahore.

**Participants:**

**EDC**

Mr. Assad A. Bukhari Project Manager

Dr. Salman A. Malik Consultant

Mr. M. Zubair Consultant

**CEMB**

Ms. Esther Khan Lecturer & Co-Principal Investigator

Dr. Zahoor Ahmed Assistant Professor & Co-Principal Investigator

Dr. Amin Ather Assistant Professor & Co-Principal Investigator

**Objectives:**

- Evaluation of Progress.
- Identification of problems.
- Provide Guidance/Assistance in completion of Questionnaire/progress reports.

**Summary:**

Progress of the two USAID-IEP projects was discussed in detail. Mr. Assad A. Bukhari outlined the objectives of the visit. Ms. Esther Khan and Dr. Amin Ather informed regarding the progress of the projects and elaborated the problems being encountered in their projects respectively.

**Progress:**

**Project 1**                      **"Microbial Control of Insect Pests in Cotton:**

As reported earlier there has been significant progress and the initial work has been completed. Some lab. scale evaluation of activity has been made. However due to delay in the supply of commodities further work is being hampered. In addition, since cotton pests appear only during the respective season which has passed complete field trials may not be possible. Nevertheless the efficacy of the culture is proposed to be monitored in the labs. and on similar pests prevailing at the time in the fields.

**Project 2**

**"Hormone Receptors as Prognostic factors in Health & Disease:**

As reported earlier the initial work has been done but further progress is being hampered by the delay in the supply of commodities. If the same are supplied expeditiously most of the work may be completed within a few months.

**Related Information:**

**Meetings of faculty/industrial staff:**

- Infrequent, only when required, no regular pattern

**Problems encountered/Reported:**

- late delivery of commodities.
- Some chemicals/commodities still awaited.
- Season out for cotton.

**Suggestions/recommendations:**

- Expeditious supply of chemicals/commodities.
- Field trials to be conducted on other similar pests.

**EDC COMMENT:**

It was stressed that every effort be made to complete the research work by the end of December 1993.

**Date:** Oct 23, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Electrical Engineering, University of Engineering and Technology, Lahore.  
**Participants:**

**EDC**

Mr. Assad A. Bukhari	Project Director
Dr. Salman A. Malik	Consultant
Mr. M. Zubair	Consultant

**UET**

Dr. A. Hameed	Chairman, Dept. of Electrical Engineering
Dr. Zubair A. Khan	Professor & Principal Investigator

**Objectives:**

- Evaluation of progress
- Identification of problems
- Provide guidance/assistance in completion of Questionnaire/Progress reports.

**Summary:**

Progress of the three USAID-IEP projects was discussed in detail. Dr. Hameed gave a brief account of the projects and the problems encountered in all the projects. Dr. Zubair elaborated all the issues raised and informed regarding the progress made and the difficulties related with engaging and holding-on the skilled help. He could not assure that the projects would be completed in full within the stipulated time. However he hoped that most of the work may be completed in time provided the financial problems are sorted out expeditiously.

**Progress:**

**Project 1**                      **Microprocessor based Multimetering, Energy & Tariff Meter:**

As reported earlier except that the logic analyzer has now been received but it is not functioning properly. It is measuring DC current by not AC current.

**Project 2**                      **Design & Development of an expert logic controller:**

As reported earlier the hardware is reported to have been developed but the software has not been completed. The work is being hampered by lack of resources including skilled help.

### Project 3

### Uninterrupted Power Supply (UPS):

As reported earlier, a prototype has been made which requires improvement and testing. Work is being hampered by lack of resources particularly the skilled/Trained staff which has successively left after getting acquainted with the project.

#### **Related information:**

##### Meetings of faculty/industrial staff:

- Infrequent, only when required, no regular pattern.

##### Problem encountered/reported:

- Late delivery of commodities.
- Lack of funds.
- Resignation of skilled workers successively after getting fully acquainted with the project as a consequence of lack of funds.
- Equipment received not fully functional.

##### Suggestions/Recommendations:

- Expeditious provision of funds/equipment.
- Installation/correction of provided equipment on priority basis.
- Engaging new/more skilled assistance.

#### **EDC Comment:**

A university loan was granted to the P.I. by UET which has been out standing for some time now. The skilled assistance engaged in the projects could not be paid the stipends in time hence they departed.

It was assured that provision of financial resources would be expedited but that every effort be made to complete the experimental work by the end of December 1993.

The counterparts namely Dr. Ain-uddin from Escorts; Mr. Kafeel and Mr. Kamal from DESCON and Mr. Zubair from Multiline were also contacted. They were aware of the problems being encountered by UET. However formal exchange of views/communication was reported to be lacking and no interim reports were being provided to the counterparts regarding the progress made or procedures adopted to over come the problems.

**Date:** Oct 25, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** HEJ Institute of Chemistry, University of Karachi, Karachi.

**Participants:**

**EDC**

Mr. Assad A. Bukhari      Project Manager

Dr. Salman A. Malik      Consultant

Mr. M. Zubair      Consultant

**HEJ**

Dr. Zafar Zaidi      Professor & Principal Investigator

Dr. Attiya Abbasi      Assistant Professor & Co-Principal Investigator

**Objectives:**

- Evaluation of progress
- Identification of problems
- Provide Guidance/assistance in completion of the Questionnaire/progress reports.

**Summary:**

Progress of the three USAID-IEP projects was discussed. Initially only Dr. Attiya Abbasi was available who discussed the projects. Later Dr. Zaidi also arrived & the meeting moved to his place. Discussion was restricted to the two projects being conducted by Dr. Zaidi. Since Dr. Atta-ur-Rehman & Dr. Iqbal were out of station, progress of the third project could not be discussed in detail.

**Progress:**

Project 2  
&  
Project 3

Bating enzymes from Animal Sources:

Development and pilot plant production of Medical Diagnostic Kits.

It was reported that good progress has been made in the projects and initial work has been completed. Further work is now being hampered due to lack of commodities. Some equipment/chemicals are still awaited. Some chemicals that have been received are either already expired or would expire in a very short time. In addition a number of chemicals were not delivered/stored at low temperature which was essential for the preservance of activity. It was also reported that supply of FPLC was requested while HPLC has been provided. It was pointed out that work might not be completed within the stipulated time.

Project 1

Investigation of Medicinal Plants for Anti-Diabetic Activity:

Progress of this project could not be discussed in detail due to absence of the concerned staff. However it was reported by the counterpart i.e. Hamdard Labs. that progress has been made and anti-diabetic activity has been found in some of their formulations. Further work is in progress.

**Related Information:**

Meetings of faculty/Industrial staff:

- Infrequent, only when required, no regular pattern.

Problems encountered:

- Late delivery of commodities.
- Equipment not to specifications.
- Some commodities/chemicals still awaited.
- Some chemicals supplied after their expiry date, others have very short period left before expiry.
- Chemicals requiring transportation/storage at low temperature were not treated such. This has adversely effected the activity/potency.

Suggestions/Recommendations:

- Expeditious supply of commodities.
- Permission to buy the chemicals off the shelf from where ever they could be obtained & provision of funds expeditiously to enable shelf purchases.

**EDC Comment:**

It was stressed that every effort be made to finish the research work by the end of December 1993.

It was requested that the activity of all those chemicals which were not delivered/stored as desired be determined to ascertain the extent of damage. If reasonable activity may be obtained then these may be used to save time.

It was also requested that in case of lack of purified material Crude extracts may be used for further work, so that the stated goals of the project may be realized to that extent.

The counterparts of the said projects i.e. Ehsanullah labs. Hamdard labs. and A.K. labs. were also contacted on 25-10-93 and 26/10/93/ It was understood that the counter-parts had faith in the expertise of the HEJ personnel and seemed convinced that perseverance would yield results. All appeared informed regarding the difficulties being faced. However formal communication between parties was desired but lacking. Mr. A. Q. Farooqui of Hamdard appeared satisfied with the progress made so far while the same may not be said for the other counterparts.

**REPORT OF**  
**NATIONAL WORKSHOP ON**  
**USAID INSTITUTIONAL EXCELLENCE PROJECT**

HELD AT

HOLIDAY INN HOTEL  
ISLAMABAD

ON

8th & 9th NOVEMBER 1993

*SPONSORED BY*

USAID/PAKISTAN

*ORGANIZED BY*

**EDC (Pvt) Limited**  
Enterprise & Development Consulting

**Authors:** Dr. Salman A. Malik  
Mr. Assad A. Bukhari

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Thanks are also due to the delegates of the Research Institutions and their respective Industrial counterparts who provided the material which formed the basis of deliberations, discussions and recommendations. We gratefully acknowledge their efforts and to all we express our appreciation.

We also feel obliged to all the participants who took part in the work-shop deliberations and contributed in a professional manner.

Our special thanks are also due to Dr. Sarah Tirmizi and Ms. Amna Mir, who made significant contributions towards its success.

To all others who helped in their own special way we would like to express our thanks.

## LIST OF ABBREVIATIONS

IEP	INSTITUTIONAL EXCELLENCE PROJECT
IE PROJECT	INSTITUTIONAL EXCELLENCE PROJECT
R.I	RESEARCH INSTITUTION(s)
P.I	PRINCIPAL INVESTIGATOR(s)
CO-P.I	CO-PRINCIPAL INVESTIGATOR(s)
OGDC	OIL & GAS DEVELOPMENT CORPORATION OF PAKISTAN
PCSIR	PAKISTAN COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH
STEDEC	SCIENTIFIC & TECHNOLOGICAL DEVELOPMENT CORPORATION OF PAKISTAN
UGC	UNIVERSITY GRANTS COMMISSION
W.T.,UGC	MEMBER WHOLE TIME UGC

## SUMMARY

A two days workshop was organized to provide an opportunity for a collective dialogue, and to establish/evaluate/enhance the objectives of IEP. All the research institutions involved participated through P.I. & Co-P.I. Almost all the Industrial counter-parts also participated through senior or executive level personnel. The agenda was long and consequently the working sessions were intense. The workshop commenced at 0800 hrs on both days and continued till 1700 hrs with intermittent lunch and coffee breaks. The presentations were made during the 1st sessions on both days followed by intensive sessions of discussions.

The presentations were well prepared and well delivered. Most of the speakers reported significant progress towards the stated objectives and hoped that the projects would be completed in full by/before the conference in February 1994. The discussions included progress made, problems encountered & their possible solutions, changes in the system which may stimulate/encourage R.I.-Industry cooperation and comments/observations/remarks from the Industrial counterparts.

All the participants enthusiastically supported the philosophy of R.I -Industry cooperative and applied research activity. The Industrial participants forcefully expressed hope and interest to support such applied research activities in various R.I. from their own resources provided some measures to safeguard their interests and investments may be made.

The contents/outline of the operational manual to be published later and ways and means for institutionalization/sustainability of the program were also discussed and a consensus arrived at.

The workshop ended with the resolve to participate even more enthusiastically in the one day conference to be held at Islamabad during February 1994.

## **OBJECTIVES**

### **EVALUATION**

- Of the over all degree of success of the projects.
- Of enthusiasm & interest of the Industrial participants for continuing such cooperative efforts.
- Of suggestions/recommendations that may be proposed during the workshop.

### **CONFIDENCE BUILDING & LEARNING**

- Enhancing the confidence between research institutions, industry and the IEP program by providing an opportunity of a collective dialogue.
- Learning from each others experience.

### **PREPARATION FOR FUTURE ACTIVITIES**

- To plan and prepare for the formal conference to be held in February 1994.
- To define themes and establish a structure for presentations and discussions and a preliminary agenda.
- To define and establish an outline of the IEP manual to be published.

## PARTICIPANTS OF WORKSHOP

### RESEARCH INSTITUTIONS

National Centre of Excellence in Geology, University of Peshawar. (NCEG)

Dr. M. Qasim Jan                      Director & Principal Investigator  
Dr. M. Tahir Shah                    Assistant Professor & Co-Principal Investigator  
Dr. Iftikhar Ahmed                   Assistant Professor & Co-Principal Investigator  
Mr. Mohammad Haneef               Assistant Professor  
Mr. Mohammad Riaz                 Research Associate

Department of Chemistry, Gomal University, D.I.Khan. (GOMAL)

Dr. G.A. Miana                      Professor & Principal Investigator

Department of Biological Sciences, Quaid-i-Azam University, Islamabad. (QAU)

Dr. Khalida Sultana                 Assistant Professor & Principal Investigator  
Dr. A. Hameed                        Assistant Professor & Principal Investigator

Centre of Excellence in Molecular Biology, University of the Punjab, Lahore. (CEMB)

Dr. S. Riazuddin                      Director & Principal Investigator  
Dr. Amin Ather                        Assistant Professor & Co-Principal Investigator  
Dr. Esther Khan                        Lecturer & Co-Principal Investigator

Department of Elect. Engg., University of Engineering & Technology, Lahore. (UET)

Dr. Zubair Ahmed Khan             Professor & Principal Investigator

HEJ Research Institute of chemistry, University of Karachi. (HEJ)

Dr. Attiya Abbasi                      Assistant Professor & Co-Principal Investigator  
Dr Mohammed Iqbal Ch.               Assistant Professor & Co-Principal Investigator

## PARTICIPANTS OF WORKSHOP

### INDUSTRIAL COUNTERPARTS

		<u>Counterparts of</u> GOMAL
PCSIR		
Prof. Dr. A. Q. Ansari	Chairman	
Dr. S. Fazal Hussian	Director General, Peshawar	
Dr. M.A. Saeed	Director General, Lahore	
Dr. Mushtaq Ahmed	Principal Scientific Officer	
STEDEC		GOMAL
Mr. Aziz A. Khan	Managing Director	
OGDC		NCEG
Mr. M. Khurshid Akhtar	Dy. Chief Geologist	
KHAWAJA GLASS CO.		NCEG
Mr. M. Khawaja Tahir Jamal	Chief Engineer	
Mr. Sajid Bari	Assistant Chief Engineer	
BIOTECH LTD		QAU
Mr. Aamer M. Qazi	Managing Director	
CIBA GIEGY		QAU/CEMB
Mr. S. Sabir	Sr. Manager, Tech. & Dev.	
HAMDARD LABS.		HEJ
Mr. A. Q. Farooqi	Chief Chemist	
EHSANULLAH LABS.		HEJ
Dr. S. Ehsanullah	Director	
A.K. LABS.		HEJ
Dr. A. Saeed Khan	Pathologist	
DESCON		UET
Mr. Kamaluddin Ahmad	Advisor Product Engg.	
ESCORTS		UET
Prof. Dr. Kazi Ain-uddin	Sr. Executive Director	

## PRESENTATIONS

All the investigators were given an opportunity to present their work. The presentations were well prepared and well delivered. Ms. Amna Mir, Dr. J.J. Monagle and Dr. Salman A. Malik acted as comparers while Mr. Assad Bukhari and Mr. Zubair participated as organizers cum-participants.

**Presentation 1:** Bating Enzymes from Animal Sources:

made by  
Dr. A. Hameed  
of QAU

The objective of this project was to provide the national leather industry with a locally prepared, cost effective, quality bating enzyme from microbial sources.

It was reported that all the lab. scale work has been completed and the procedures have been standardized. The results of lab. scale work were reported to be very promising both in terms of economic value and the quality of final product obtained.

**Presentation 2:** Bating Enzymes from Animal Sources:

made by  
Dr. Attiya Abbassi  
of HEJ

The objective of this project was to provide the national leather industry with a locally prepared, cost effective, quality bating enzyme from pancreas.

It was reported that the initial work has been completed and crude/partially purified material has been obtained which still requires to be evaluated for activity and the quality of final product. Their work has been delayed due to delay in the supply of commodities & expired/deformed chemicals.

**Presentation 3:** Bioinsecticides in the Control of Insect Pests of Cotton:

made by  
Dr. Khalida Sultana  
of QAU

The objective of this project was to provide a locally prepared, cost effective, broad based/broad spectrum bioinsecticide which may supplement/substitute the chemical insecticides. In addition a cost effective, quality medium for propagation of the microbes was also to be developed.

It was reported that certain microbes possessing insecticidal activity have been isolated and characterized. The results obtained so far are promising. Further work involving synergistic action of a mixture of these microbes is under way. More meaningful results may be obtained/presented during the conference in February 1994.

**Presentation 4:**  
made by  
Ms Esther Khan  
of CEMB

Microbial Control of Insect Pests in Cotton:

The objective of this project was to provide a cost effective but potent bioinsecticide to supplement/substitute the chemical insecticides against cotton ball worm. In addition a cost effective, quality medium for propagation of the microbe was also to be developed.

It was reported that the lab. scale work has been completed. The microbe possessing acute insecticidal activity has been successfully propagated in significant quantities in a very economical medium developed at/by CEMB. Potency of the culture has been evaluated on a small scale and the results are very promising. Large scale field trials are now being planned.

**Presentation 5:**  
made by  
Dr. G. A. Miana  
of GOMAL UNIV.

Commercial Exploitation of Azadirachtin:

The objective of this project was to prepare a cost effective and potent pest repellent from neem seeds.

It was reported that the lab. scale work has been successfully completed. The active compound "Azadirachtin" has been extracted using various solvents. Some field trials have been conducted and all extracts have been found to have potency. The results with ethanol extract are promising. Arrangements for bulk extraction are being made whereafter large scale field trails may be possible.

**Presentation 6:**  
made by  
Dr. Zubair  
of UET

Un-interrupted Power Supply (UPS):

The objective of this project was to develop a cost effective and reliable UPS system using indigenous technology or basic materials/components readily available in the local market.

It was reported that the initial work has been done and assembly of such a UPS is in progress. A prototype would be completed in the near future.

**Presentation 7:**  
made by  
Dr. Zubair  
of UET

**Design & Development of an Expert Logic Controller:**

The objective of this project was to develop a reliable and cost effective A.C. motor controlling system in accordance with the needs of the national industries using components readily available in the local market.

It was reported that a design for such a system has been developed and a prototype is being assembled.

**Presentation 8:**  
made by  
Dr. Zubair  
of UET

**Microprocessor based Multimetering, Energy & Tariff Meter:**

The objective of this project was to develop a cost effective & reliable/multimetering energy and tariff meter using components readily available in the local market.

The initial work was reported to have been completed and a prototype is being assembled. To this prototype more functions may be added as and when required.

**Presentation 9:**  
made by  
Dr. Amin Ather  
of CEMB

**Hormone Receptors as Prognostic Factors in Health & Disease:**

The objective of this project was to develop a cost effective and reliable assay kit for an early evaluation of cancer risk to the subject due to hormonal imbalance.

Some initial work was reported to have been completed and further work is under way. More meaningful results may be obtained/presented during the conference in February 1994.

**Presentation 10:**  
made by  
Dr. Attiya Abbassi  
of HEJ

**Development and Pilot Plant Production of Medical Diagnostic Kits.**

The objective of this project was to prepare cost effective and reliable assay kits for routine clinical analyses.

It was reported that some of the initial work has been completed and further work is under way. A few enzyme-based kits, used most frequently in routine clinical analyses may be prepared by/before the conference in February 1994.

**Presentation 11:**  
made by  
Dr. Iqbal Ch.  
of HEJ

Investigation of Medicinal Plants for Anti-diabetic Activity:

The objective of this project was to determine efficacy of the various anti-diabetic formulations prepared by Hamdard Labs. Pakistan and to identify the potent ingredient(s) in such formulations. In addition to verify the anti-diabetic potency of some other herbs commonly assumed to have such efficacy.

It was reported that out of five formulations commonly prescribed only two have positive potency, two have no potency and one has negative potency. It was also reported that on the basis of these results and in accordance with the recommendations of HEJ, the practitioners have been advised to prescribe only the two positive potency containing formulations. No hypoglycemic activity was reported in the isolated fractions of these two formulations. The anti-diabetic potency in other herbs was also reported to be absent in all herbs studied except one. Further work is in progress.

**Presentation 12:**  
made by  
Dr. G.A. Miana  
of GOMAL

Commercial Exploitation of Taxol Anti-Cancer Drug:

The objective of this project was to economically extract and study "Taxol" from Taxus baccata. Taxol is reported to contain anticancer activity.

It was reported that extracts from Taxus baccata leaves have been studied but no "Taxol" could be detected. Preparation for a more extensive study using leaves & other parts of the tree is under way and more meaningful results may be obtained/presented during the conference in February 1994.

**Presentation 13:**  
made by  
Dr. Iftikhar Abbasi  
of NCEG

Sedimentological Studies in Potential Hydrocarbon-bearing Strata:

The objective of this project was to do the initial geological studies of the area to help OGDC in their oil exploration efforts.

It was reported that the project has been successfully completed and a detailed report has already been submitted to the parties involved in the project. The OGDC representative commended the work/report of NCEG.

**Presentation 14:**  
made by  
Tahir Shah  
of NCEG

Identification & Characterization of Quality of Silica Sand Resources for Glass Making:

The objective of this project was to study & recommend alternate sites for procuring quality silica sand for the manufacture of glass.

It was reported that several known silica sand deposit sites have been studied/evaluated for quality of silica sand and initial recommendations have been made. Further work involving more extensive analyses and still more sites is under way and final recommendations would be made before/by the conference in February 1994.

**Presentation 15:**  
made by  
Dr. Qasim Jan  
of NCEG

Inclusion Studies of Sheet Glass:

The objective of this project was to study the inclusion bodies present in the glass samples and make corrective recommendations.

It was reported that the initial work has been completed and detailed analyses of the inclusions is under way. Once the final results are obtained corrective recommendations would be made.

**Presentation 16:**  
made by  
Tahir Shah  
of NCEG

Review of Analytical Processes at Khawaja Glass Company:

The objective of this project was to develop/propose cost effective but reliable and time saving alternate methods for making routine analysis in the quality control lab. at Khawaja Glass Company (KGC). In addition to make recommendations for improving the efficiency of the quality control labs. at KGC.

It was reported that such alternate methods/recommendations have been made which are being considered for implementation by KGC. Final evaluation of the work/results may only be done after these have been implemented by KGC which is expected to be in the near future.

## DISCUSSIONS

The participants enthusiastically discussed the results & progress of the projects both in terms of their economic/applied value and their promise of completion. There was a consensus that all the projects were of significant economic/applied value and that many of them may be completed before/by the conference in February 1994.

All the problems encountered during the course of these projects were also discussed. These included those which may be non-reoccurring as well as those which are likely to reoccur in future again. Some possible solutions to these problems were also discussed including suggestions/changes in the system which are likely to stimulate/encourage such cooperative applied research activities and help in institutionalization of this idea. The discussed problems and suggestions upon which consensus was developed were recorded and are presented here in a tabular form.

The Industrial participants forcefully expressed hope and interest to support such applied research activities from their own resources provided they are assured exclusive rights on results; the work is carried out in a timely manner and that they are kept informed regarding the progress of the research work on regular basis.

The contents/outline of an operational manual to be published later was also discussed and a consensus arrived at. The participants were of the view that such a manual would serve as a useful reference/information material for future activities. The outline of the manual is also presented here an annexure.

The format and a preliminary agenda of the one day conference to be held at Islamabad in February 1994 was also discussed. The delegates resolved to participate in the conference even more enthusiastically. The representatives of the R.I. assured that they would be able to present final results/more meaningful data in the conference provided the earlier discussed problems are solved expeditiously.

## **LIST OF PROBLEMS**

### **IE Project Problems**

- o Progress Reports (Frequency and Completeness) was unsatisfactory.
- o Contact with industrial counterparts/level of contacts/reports/frequency was not adequate.
- o High priority to project activities was not given by the administrators.
- o Timeliness of projects, scheduling and completion required improvement.
- o Financial Management some times caused constraint.

### **USAID Problems**

- o Late Delivery of commodities.
- o Slow processing of MOUs.
- o Incomplete delivery of commodities.
- o Improper packing of sensitive items.
- o Interruption of consultant service.

### **USAID/University Problems**

- o Slow determination of commodity specifications.
- o Misunderstanding of USAID rules/operating procedures.

### **Industry Problems**

- o Confidence level less than desired.
- o Intellectual Rights not assured.
- o Timeliness to be given priority.

## LIST OF SUGGESTIONS

### Research funding/management

- o Provision of funds in a timely manner by all the donor/sponsoring agencies.
- o Identification and reservation of funds for research purposes.
- o Publicity of funds available by all donor/sponsoring agencies.
- o Funding for research students should be made available.

### Incentives

- o Incentives for research productivity should be incorporated.
- o Positive merit award for research accomplishments should be incorporated.
- o Rules for consultancy should be improved/modified to encourage R.I - Industry cooperation.

### Infrastructure

- o Improved infrastructure for research activities.
- o Strong focus on external research.
- o Identification of national scientific and technological priority.
- o Maintenance of equipment (spare parts/service) to be improved.
- o Technical staff (service) to be expanded.
- o Applied education at undergraduate level to be extended.

## **ACHIEVEMENTS**

**It emerged as a consensus view that;**

**The objectives set forth for the workshop were fully accomplished.**

**Credibility of the research institutions for carrying out applied research was established.**

**Alternate mechanisms for continuing such cooperative applied research activities were proposed.**

**A high level of participation and enthusiasm was achieved.**

**All participants expressed enthusiasm to continue cooperative applied research activities.**

**The out line of the operational manual was reviewed and discussed.**

**Planning for the conference was initiated and commitment by the industrial participants was obtained.**

**The problems encountered by both the groups of participants were evaluated.**

**AGENDA**  
**INSTITUTIONAL EXCELLENCE PROJECTS (IEP) WORKSHOP**

**NOVEMBER 8, 1993**

07:30 to 07:50                      Arrival and Registration  
08:00 to 08:15                      Welcome and opening Remarks

**PROJECT PRESENTATIONS (maximum 15 min. each presentation)**

08:15 to 08:30	Bating Enzymes	QAU
08:30 to 08:45	Bating Enzymes	HEJ
08:45 to 09:00	Bioinsecticides	QAU
09:00 to 09:15	Bioinsecticides	CEMB
09:15 to 09:30	Natural Insecticides	GOMAL
09:30 to 09:45	Uninterrupted Power Supply Unit (UPS)	UET
09:45 to 10:00	A.C. Motor Controller	UET
10:00 to 10:15	Multimetering, Energy & Tariff Meter	UET
10:15 to 10:30	Diagnostic Kits	CEMB
10:30 to 10:45	Diagnostic Kits	HEJ
10:45 to 11:00	Antidiabetic Compounds	HEJ
11:00 to 11:15	Anticancer Compound	GOMAL
11:15 to 11:30	Sedimentology of Kohat Basin	NCEG
11:30 to 11:45	Silica Sources	NCEG
11:45 to 12:00	Inclusions/Problems in Glass Manufacturing	NCEG
12:00 to 12:15	Improvements in Analytical Processes/ Glass Manufacturing	NCEG
12:30 to 13:30	<b>LUNCH</b>	
13:30 to 17:00	Discussion of interactions with industrial participants and plans for the final conference in 1994	

**NOVEMBER 9, 1993**

07:30 to 07:50                      Arrival and Registration  
08:00 to 13:30                      Organized review of projects with PI's with comments  
form industrial participants  
13:30 to 14:30                      **LUNCH**  
14:30 to 17:00                      Joint discussions of project results and procedures.  
Planning of conference format & procedures for conference  
presentations and discussions.

## **FOLLOW UP ACTIONS**

**PLANNING OF CONFERENCE**

**PREPARATION OF OPERATIONAL MANUAL**

**CONTINUE ASSISTANCE, MONITORING & EVALUATION.**

## IEP MANUAL - OUTLINE

### I. INTRODUCTION

- o Purpose of Manual
- o Content
- o Evolutionary Character

### II. HISTORY OF INDUSTRY/UNIVERSITY R&D COOPERATION

### III. PRESENT SITUATION

- o Background on universities, faculty training/expertise
- o Background on Pakistan Council for Scientific and Industrial Research laboratories and STEDEC
- o Industrial structure, technology acquisition processes, technology improvement

### IV. ESSENTIAL COMPONENTS FOR ESTABLISHMENT OF INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH EFFORTS

- o Communication
- o Appropriate research backgrounds
- o Clear definition of problems
- o Clear delineation of skills
- o Clear outline of proposed applied research work
- o Comprehensive discussion of cooperative arrangements
  - clearly defined scope of work
  - well-defined schedule for progress and completion
  - clearly defined financial support arrangements
  - written working agreement outlining project activities
  - written agreement on royalties, profit sharing
- o Carefully prepared and complete proposal governing scope of work

### V. OPERATIONAL COMPONENTS FOR PROJECT OPERATION

- o Business development cells in each of the participating research/educational organization.
- o Central Coordinating unit at UGC with participation membership form the FPCCI representing private sector.
- o Interdisciplinary/multidisciplinary research
- o Contacts with industry
- o Research planning
- o Proposal writing
- o Financial management
  - costing of projects
  - record keeping
  - financial reporting
  - university funding
  - indirect costs
  - profit sharing/royalty agreements
  - financial incentives for university participants
- o Project scheduling and timing
- o Project reporting
- o Project completion
- o Project follow-up
- o Publications/patents

**PROGRESS IMPLEMENTATION REVIEW**  
**OF**  
**USAID INSTITUTIONAL EXCELLENCE PROJECT**

November 14, 1993

**BRIEFING ON**  
**NATIONAL WORKSHOP**

**HELD AT**

**HOLIDAY INN HOTEL**  
**ISLAMABAD**

**ON**

**8th & 9th NOVEMBER 1993**

**SPONSORED BY**

**USAID/PAKISTAN**

**ORGANIZED BY**

**EDC (Pvt) Limited**  
**Enterprise & Development Consulting**

**Presentation Made By**

**Dr. Salman A. Malik**

Ladies and Gentlemen;

#### **Transparency 1**

I shall be talking about the workshop which was held on the 8th & 9th of this month at Holiday Inn Islamabad.

The summary of my talk is shown here as contents, it includes

- Objectives - Participants - Agenda/Schedule - Presentations & Discussion
- Achievements - Follow up Actions.

#### **Transparency 2**

The objectives of workshop may be classified into 3 principle groups i.e. evaluation, confidence building and learning, preparation of future activities.

1 includes..... 2 includes..... 3 includes.....

#### **Transparency 3**

There were 2 main groups of participants (1) Research Institutions, which include ..... (2) Industrial Counterparts, which include ..... All the principal investigators/co-principal investigators from the research institutions participated in the workshop.

Almost all the industrial counterparts were also able to participate and I would like to highlight 3 aspects of their participation

- i The level of participation was very high e.g 5 Managing Directors or Executive Directors, 3 General Managers, 3 Chiefs of sections participated.
- ii Although they were given the option to attend only the 2nd day of the workshop but most of them participated on both days and stayed throughout the deliberations.
- iii I would especially mention that P.C.S.I.R. was represented by the Chairman, accompanied by 2 Director Generals and a Chief of the Section.  
We feel that in terms of level/quantum and enthusiasm the workshop was well participated.

#### **Transparency 4**

The agenda was long and schedule was rather tight. The workshop commenced at 0800 hrs on both days and deliberations continued till 1700 hrs. Ofcourse with a lunch and a Coffee break in between.

#### **Transparency 5**

According to the Subject/Nature of Products, the research activities may be classified into 5 groups, these include 1 ..... 2..... 3..... 4..... 5.....

I may mention here that although there is diversity of subjects or verity of different products which are to be developed but there are some common features shared by all, 2 of these common features worth mentioning are (i) They all have great promise of economic benefits (ii) The products may be developed within the envisaged time or the results obtained would have immediate applicable value.

#### **Transparency 6**

According to the rate of progress made so far or the demonstration of potential economic value and promise of successful completion the projects may be placed in 3 classes.

- i Very Good      ii Good      iii Fair

All the projects placed in class (1) i.e. Very Good are those which have made significant progress. The principal investigators have been able to complete the work on the lab. scale and were able to report the lab. scale work results. These projects only require either up-grading the scale of production or more intensive field trials, but in principle these have already produced products or results of applicable value.

- e.g. 1. Bating Enzymes at QAU - Dr. H ..... tion and is moving into large scale production. His industrial counterpart is preparing for a pilot plant for the actual economic evaluations.
- e.g. 2. Bio-Insecticides at CEMB. - They have not only identified and characterized the microbe (Bacillus thuringiensis) but have also successfully produced large quantities of the same. Their lab. results with respect to potency and costs are very promising. They are now preparing for extensive field trials.
- e.g. 3. Antidiabetic Agents at HEJ - Special mention of this work may be made this project has produced results, some of which have already been applied. It has been found that only 2 out of 5 formulations have potency  
- 1 of the 3 which does not have potency, in fact has negative activity.

In accordance with the recommendations of HEJ, Hamdard Labs., have already advised their practitioners to stop prescribing the said formulations which are shown to be non-hypoglycemic.

**Active:** Dolabi, Nuskha-e-Ziabetes

**Non Active:** Joshaba-e-Ziabetes, Ziabol & Joshaba-e-Thukm-e-Hayat

Similar things may be said about all the rest of the projects placed in this group.

The class 2 i.e. Good, has two projects which have made progress but the principal investigators have not been able to complete their lab. scale work as yet. However these projects have a promise of completion before the conference in February.

Class 3 i.e. Fair includes 3 projects i.e. Anti Cancer Compound, Diagnostic Kits, Inclusion Problems in Glass Manufacturing. Out of these the "Anti Cancer Compound" project has made significant progress but unfortunately the active compound (TAXOL) is reported to be absent in the specie of plant found in Pakistan. Therefore although in academic terms the project has been successful but in commercial terms it does not appear to have great promise, the other 2 have promise of success but they might not be completed fully as envisaged earlier. However some parts of these would be completed and are likely to have potential economic value.

#### **Transparency 7**

In addition to achieving the objectives mentioned earlier we were able to achieve .....

#### **Transparency 8**

The two principal follow up actions, other than continuing progress evaluation, monitoring, co-ordination & problems solving activities are .....

#### **Transparency 9**

It shows the outline of the operational manual approved by the participants of the workshop. This manual is intended to serve as a guide for future similar activities and shall be published before/by the end of IEP.

Thank you

~~Questions, Comments and General Discussion of IEP progress & problems including follow up activities.~~

# IEP-USAID

SUMMARY OF WORKSHOP

HELD AT

HOLIDAY INN HOTEL

ISLAMABAD

ON

8th & 9th NOVEMBER 1993

FROM 0730 hrs TO 1700 hrs

## CONTENTS OF PRESENTATION

OBJECTIVES

PARTICIPATION

AGENDA

PRESENTATIONS & DISCUSSION

ACHIEVEMENTS

FOLLOW UP ACTIONS

# OBJECTIVES

## EVALUATION

- Of the over all degree of success of the projects.
- Of enthusiasm & interest of the Industrial participants for continuing such cooperative efforts.
- Of suggestions/recommendations that may be proposed during the workshop.

## CONFIDENCE BUILDING & LEARNING

- Enhancing the confidence between research institutions, industry and the IEP USAID program by providing an opportunity of a collective dialogue.
- Learning from each others experience.

## PREPARATION FOR FUTURE ACTIVITIES

- Planning and preparation of the formal conference to be held in February 1994.
- To define themes and establish a structure for presentations and discussions and a preliminary agenda.
- To define and establish an outline of the IEP manual to be published.

# PARTICIPANTS OF WORKSHOP

## RESEARCH INSTITUTIONS

- NCEG

- GOMAL

- QAU

- CEMB

- UET

- HEJ

## INDUSTRIAL COUNTER PARTS

OGDC &  
KHAWAJA GLASS CO.

P.C.S.I.R & STEDEC

CIBA GIEGY &  
BIOTECH. LTD.

CIBA GIEGY &  
PUNJAB DRUG HOUSE

DESCON;  
ESCORTS &  
MULTILINE

HAMDARD LABS.;  
EHSANULLAH LABS. &  
A.K. LABS.

# AGENDA

## INSTITUTIONAL EXCELLENCE PROJECTS (IEP) WORKSHOP

**NOVEMBER 8, 1993**

07:30 to 07:50	Arrival and Registration
08:00 to 08:15	Welcome and opening Remarks

**PROJECT PRESENTATIONS** (maximum 15 min. each presentation)

08:15 to 08:30	Bating Enzymes	QAU
08:30 to 08:45	Bating Enzymes	HEJ
08:45 to 09:00	Bioinsecticides	QAU
09:00 to 09:15	Bioinsecticides	CEMB
09:15 to 09:30	Natural Insecticides	GOMAL
09:30 to 09:45	Uninterrupted Power Supply Unit (UPS)	UET
09:45 to 10:00	A.C. Motor Controller	UET
10:00 to 10:15	Multimetering, Energy & Tariff Meter	UET
10:15 to 10:30	Diagnostic Kits	CEMB
10:30 to 10:45	Diagnostic Kits	HEJ
10:45 to 11:00	Antidiabetic Compounds	HEJ
11:00 to 11:15	Anticancer Compound	GOMAL
11:15 to 11:30	Sedimentology of Kohat Basin	NCEG
11:30 to 11:45	Silica Sources	NCEG
11:45 to 12:00	Inclusions/Problems in Glass Manufacturing	NCEG
12:00 to 12:15	Improvements in Analytical Processes/ Glass Manufacturing	NCEG
12:30 to 13:30	<b>LUNCH</b>	
13:30 to 17:00	Discussion of interactions with industrial participants and plans for the final conference in 1994	

**NOVEMBER 9, 1993**

07:30 to 07:50	Arrival and Registration
08:00 to 13:30	Organized review of projects with PI's with comments form industrial participants
13:30 to 14:30	<b>LUNCH</b>
14:30 to 17:00	Joint discussions of project results and procedures. Planning of conference format & procedures for conference presentations and discussions.

# SUBJECT-WISE CLASSIFICATION OF PRODUCTS

1. ENZYMES FOR LEATHER PROCESSING
2. BIO-INSECTICIDES
3. BIO-MEDICAL PRODUCTS
4. ELECTRONIC PRODUCTS
5. GEOLOGY
  - GLASS PRODUCTION
  - PETROLEUM EXPLORATION

VERY GOOD

Bating Enzymes	QAU
Bioinsecticides	CEMB
Antidiabetic Compounds	HEJ
Natural Insecticide	GOMAL
Uninterrupted Power Supply Unit (UPS)	UET
Multimetering, Energy & tariff Meter	UET
Improvements in Analytical Processes/ Glass Manufacturing	NCEG
A.C. Motor Controller	UET
Silica Sources	NCEG
Diagnostic Kits	CEMB
* Sedimentology of Kohat Basin	NCEG

GOOD

Bating Enzymes	HEJ
Bioinsecticides	QAU

FAIR

Anticancer Compound	GOMAL
Diagnostic Kits	HEJ
Inclusion/Problems in Glass Manufacturing	NCEG

## ACHIEVEMENTS

Established credibility of the research institutions for carrying out applied research.

Proposed alternate mechanism for continuing such cooperative applied research activities.

Achieved a high level of participation and enthusiasm.

All participants expressed enthusiasm to continue cooperative applied research activities.

Reviewed and discussed the out line of the operational manual.

Initiated planning for the conference and obtained commitment by the industrial participants.

Evaluated the problems encountered by both the groups of participants.

# FOLLOW UP ACTIONS

PLANNING OF CONFERENCE

PREPARATION OF OPERATIONAL MANUAL

# **IEP MANUAL - OUTLINE**

## **I. INTRODUCTION**

- o Purpose of Manual
- o Content
- o Evolutionary Character

## **II. HISTORY OF INDUSTRY/UNIVERSITY R&D COOPERATION**

## **III. PRESENT SITUATION**

- o Background on universities, faculty training/expertise
- o Background on Pakistan Council for Scientific and Industrial Research laboratories and STEDEC
- o Industrial structure, technology acquisition processes, technology improvement

## **IV. ESSENTIAL COMPONENTS FOR ESTABLISHMENT OF INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH EFFORTS**

- o Communication
- o Appropriate research backgrounds
- o Clear definition of problems
- o Clear delineation of skills
- o Clear outline of proposed applied research work
- o Comprehensive discussion of cooperative arrangements
  - clearly defined scope of work
  - well-defined schedule for progress and completion
  - clearly defined financial support arrangements
  - written working agreement outlining project activities
  - written agreement on royalties, profit sharing
- o Carefully prepared and complete proposal governing scope of work

## **V. OPERATIONAL COMPONENTS FOR PROJECT OPERATION**

- o Business development cells in each of the participating research/educational organization.
- o Central Coordinating unit at UGC with participation membership form the FPCCI representing private sector.
- o Interdisciplinary/multidisciplinary research
- o Contacts with industry
- o Research planning
- o Proposal writing
- o Financial management
  - costing of projects
  - record keeping
  - financial reporting
  - university funding
  - indirect costs
  - profit sharing/royalty agreements
  - financial incentives for university participants
- o Project scheduling and timing
- o Project reporting
- o Project completion
- o Project follow-up
- o Publications/patents

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# **INSTITUTIONAL EXCELLENCE PROJECT**

## **Project Monitoring & Evaluation Report**

Number: 2

*Submitted*

*To*

**United States Agency for International Development  
Islamabad**

By

**EDC (Pvt) Limited**  
Enterprise & Development Consulting

Authors: Dr. Salman A. Malik  
Mr. Assad Bukhari

**Date:** December 14, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** National Centre of Excellence in Geology (NCEG); University of Peshawar, Peshawar.

**Participants:**

**USAID**

Ms. Amna Mir                      Project Officer

**EDC**

Mr. Assad A. Bukhari              Project Manager

Dr. Salman A. Malik              Consultant

**NCEG**

Dr. Qasim Jan                      Director & Principal Investigator

Dr. Tahir Shah                      Assistant Professor & Co-Principal Investigator

Dr. Hamidullah                      Assistant Professor & Co-Principal Investigator

**Objectives:**

- Evaluation of progress.
- Provide Guidance/Assistance in solution of problems still persisting.
- Discussion of conference to be held in February 1994.
- To perform end-use check of commodities.

**Summary:**

Progress of the three USAID-IEP projects was discussed in detail. Dr. Qasim Jan opened the discussion with general remarks followed by the details of individual projects. Since the fourth project has already been completed, it needed no discussion. It was understood that the projects would be completed within the earlier stipulated time.

## **Progress:**

### **Project 1**                    **Identification & Characterization of Quality of Silica Sand Resources for Glass Making:**

It was reported that analysis of about 50 samples have been completed and still more are being carried out.

Sampling from some additional areas like Chashma have been carried out and the analytical results are expected to be completed in the near future.

### **Project 2**                    **Inclusion Studies of Sheet Glass:**

It was reported that repair to the instruments is in progress but have not yet been completed. Sufficient sample material is however available with NCEG and analytical work through other means is underway. Bulk analysis of the samples have been completed, while micro thin sections of the sample material are being studied. The results are awaited and would be provided at a later date.

### **Project 3**                    **Review of Analytical Processes at Khawaja Glass Company:**

It was reported that the work on this project has more or less been completed. The results have however not been provided to Khawaja Glass Company as yet but would be provided in the near future. The final evaluation of the results would be possible only after the implementation and verification by Khawaja Glass Company.

### **Project 4**                    **Sedimentological Studies in Potential Hydrocarbon bearing Strata:**

As reported earlier the project has been completed.

## **Related Information:**

### **Meetings of faculty/industrial staff:**

- Two meetings reported since the workshop.

### **Problems encountered/reported:**

- Delay in repair to damaged equipment. Some of the required components are reported to be expensive while others are unavailable and may need to be specially arranged.

**Suggestions/Recommendations:**

- More intensive/communication/coordination.

**EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of January 1994.

NCEG was requested to provide the script of the workshop presentations at an early date.

NCEG was informed that the proposed national conference would be held in the 2nd week of February 1994 and is likely to be inaugurated by the Prime Minister.

NCEG was also informed that there would be a poster session at the conference to facilitate the participants in publicizing their institutional facilities/expertise/achievements.

NCEG was requested to provide a formal report to their industrial counterpart at an early date for their evaluation/implementation. NCEG assured that the same would be done.

The industrial counterpart of NCEG i.e. Khawaja Glass Company (KGC) was visited on 22nd December 1993 to obtain their view of the project. It was understood that the relationship between the two counterparts have improved significantly since the workshop. However, further increased communication/coordination is desired. KGC is anxiously awaiting the detailed report from NCEG for evaluation/implementation.

**Date:** December 20, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Chemistry, Gomal University, Dera Ismail Khan.

**Participants:**

**EDC**

Dr. Salman A. Malik      Consultant

Mr. M. Zubair      Consultant

**Gomal University**

Dr. G. A. Miana      Professor & Principal Investigator.

**Objectives:**

- Evaluation of progress.
- Provide Guidance/Assistance in solution of problems still persisting.
- Discussion of conference to be held in February 1994.
- To perform end-use check of commodities.

**Summary:**

Progress of the two USAID-IEP projects was discussed. Both projects were discussed at length including the progress made so far, the problems encountered and their possible solutions. The end-use check of the commodities was also carried out on behalf of the IEP Project Officer.

**Progress:**

**Project 1      Commercial Exploitation of Taxol Anti-Cancer Drug:**

As reported earlier leaves of Taxus baccata collected from Nathia Gali had been extracted with various solvents and the extract tested for the presence of Taxol. No Taxol was detected. However collection of more sample material is to be done after the first snow fall which is hoped to be soon. Further work on the project may be carried out only thereafter and a final view of the project obtained.

As stated in the previous report, Azadirachtin was extracted using a variety of solvents and tested on sun-flower fields. It was reported to show potency in all cases. Work for its bulk extraction is reported to be underway in collaboration with PCSIR labs, Lahore. It is understood that the extraction work would be completed in the near future and evaluation of potency of the extract would be preformed immediately thereafter. Concurrently estimation/evaluation of its half-life under field conditions, the most economical method of extraction, mode of packing and spraying would also be done. Dr. Miana seems convinced that most of the work would be completed by/before the proposed conference.

#### **Related Information:**

##### Meetings of faculty/industrial staff:

- Frequent, as and when ever needed, no regular pattern.

##### Problems encountered/reported:

- Equipment still not functional because of lack of certain elements and unavailability of printed matter/information booklet.

##### Suggestions/Recommendations:

- Expedite provision of missing pieces of equipment.
- Provide assembly/operation manual on priority.

#### **EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of January 1994.

Dr. Miana was requested to provide the script of the workshop presentations at an early date.

He was also informed that the proposed conference would be held in the 2nd week of February 1994 and is likely to be inaugurated by the Prime Minister.

He was also informed that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

The collaborating industrial counterparts for project No. 2 (Azadirachtin) were STEDEC and "PCSIR" Laboratories Lahore, which were contacted later on 2-1-1994. Present at PCSIR were Dr. Tanveer and Dr. Saleem who informed that Dr. Mushtaq who was earlier working on the project has now been transferred to Quetta and that they would be working on the project instead. They also informed that preparation for bulk extraction work is underway and would be completed in near future whereafter they would provide a detailed report of their work.

As reported earlier PCSIR Labs. would help Gomal University in bulk extractions/field trials of the extract and provide results. STEDEC would thereafter do the pre-marketing survey/ evaluation and in accordance with the economic and potency considerations market it in a finished product condition. Unfortunately Mr. Aziz A. Khan was not available at STEDEC.

**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Biological Sciences, Quaid-i-Azam University, Islamabad.  
**Participants:**

**EDC**

Dr. Salman A. Malik            Consultant

**QAU**

Dr. Abdul Hameed            Assistant Professor & Principal Investigator

Dr. Khalida Sultana           Assistant Professor & Principal Investigator

**BIO-TECHNOLOGY LTD PAKISTAN**

Amir Qazi                      Technical Director

**Objectives:**

- Evaluation of progress.
- Provide Guidance/Assistance in solution of problems still persisting.
- Discussion of conference to be held in February 1994.

**Summary:**

The progress of the two USAID-IEP projects was discussed with both P.I(s) a few times during the 2nd & 3rd week in January 1994. Since both the P.I(s) were preoccupied in preparations for participating in the one week International symposium on bio-technology being held in Fasilabad, a regular meeting with them was not possible at the time. However relevant information was exchanged with both P.I(s) through short intermittent meetings during the above stated period.

**Progress:**

**Project 1**

**Bating Enzymes from Animal Sources:**

The progress of the project was discussed. As stated in the earlier report the project on the whole has been going rather well. All the lab. scale work has been completed. The installation of the fermenter for large scale production has not been completed yet. However it was reported to be in its final stage of completion and would be commissioned in the near future. Thereafter subject to supply of necessary commodities & glass ware, which are still awaited, large scale production would be immediately started and the product supplied to the counterparts for evaluation of activity under industrial conditions. Concurrently the technique for maximum efficiency/ production of the enzymes would also be perfected at bulk scale level.

The progress of the project was discussed with Dr. Khalida Sultana who is now looking after the project as the Principal Investigator. Dr. Khalida reported that some progress has been made but due to delay in the supply of commodities, many of which are still awaited, and confirmation of her status as a P.I. for this project by the university the work has been seriously hampered.

**Related Information:**

Meetings of faculty/industrial staff:

- Regular/Frequent, on the average once a week in case of project 1.
- Infrequent, no regular pattern in case of project 2.

Problems encountered/reported:

- Delay in installation of the fermenter.
- Chemicals/glass ware still awaited.

**EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of January 1994.

Both the P.I(s) were requested to provide the scripts of their workshop presentations at an early date.

They were also informed that the proposed conference would be held in the 2nd week of Feb. 1994 and is likely to be inaugurated by the Prime Minister.

They were also informed that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

CIBA GIEGY, Multan and Lahore are the combined industrial counterparts of project No. 2 at QAU, Islamabad, and project No. 1 at CEMB, Lahore. They were respectively approached on 1.1.1994 & 2.1.1994 as mentioned later in the report in EDC comments following CEMB progress.

**Date:** December 26, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** HEJ Institute of Chemistry, University of Karachi, Karachi.

**Participants:**

**EDC**

Mr. Assad A. Bukhari      Project Manager

Dr. Salman A. Malik      Consultant

**HEJ**

Dr. Attaur Rehman      Director & Principal Investigator

Dr. M. Iqbal Chaudhry      Assistant Professor & Co-Principal Investigator

Dr. Zafar Zaidi      Professor & Principal Investigator

Dr. Attiya Abbasi      Assistant Professor & Co-Principal Investigator

**Objectives:**

- Evaluation of progress.
- Provide Guidance/Assistance in solution of problems still persisting.
- Discussion of conference to be held in February 1994.

**Summary:**

Separate meetings were held with both the Principal Investigators and their Co-Principal Investigators to discuss the progress of the three USAID-IEP projects.

All the projects were discussed at length including the progress made so far, the problems being encountered and their possible solutions.

**Progress:**

**Project 1**

**Investigation of Medicinal Plants for Anti-Diabetic Activity:**

It was reported that significant progress has been made in this project and four plants have been identified which show hypoglycemic activity. An improved formulation is now being prepared from these four and some other plants. This formulation is expected to be ready and evaluated for activity/toxicity by/before the conference in February 1994. Further work in collaboration with Hamdard labs. on the project is reported to continue even after the termination of IEP.

Project 2  
&  
Project 3

Bating Enzymes from Animal Sources:

Development and Pilot Plant Production of Medical Diagnostic Kits.

It was reported that further progress has been made in both the projects and the work is continuing. Work is however being hampered due to lack of commodities. Replacement of expired/damaged chemicals as well as provision of missing chemicals is still awaited.

It was understood that if the desired commodities may be supplied expeditiously significant achievements may be made in both the projects by/before the conference in February 1994. In this respect they were assured by EDC representatives of all possible assistance.

**Related Information:**

Meetings of faculty/Industrial staff:

- Infrequent, only when required, no regular pattern.

Problems encountered:

- Replacement/provision of some commodities/chemicals still awaited.

Suggestions/Recommendations:

- Expeditious supply of commodities.

**EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of January 1993.

Dr. Attiya Abbasi and Dr. Iqbal Chaudhary were requested to provide the script of the workshop presentation at an early date.

They were all informed that the proposed conference would be held in the 2nd week of February 1994 and is likely to be inaugurated by the Prime Minister.

They were all also informed that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

The counterparts namely Mr. Farooqui of Hamdard labs., Dr. Ehsan Ullah of Ehsan Ullah labs. and Dr. Saeed Khan of A.K. labs. were contacted on 28th December 1993.

They were aware of the progress made as well as the problems being encountered by HEJ. However format exchange of views/communication was reported to be still lacking and no interim reports were being provided to the counterparts regarding the progress made or procedures adopted to overcome the problems.

**Date:** December 27, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Introduction of IEP in private sector.  
**Location:** Federation House, Karachi.

**Participants:**

**EDC**

Mr. Assad Bukhari                      Project Manager

Dr. Salman A. Malik                      Consultant

**FPCCI**

Mr. M.Rafiq Khan                      Secretary General

**Objectives:**

- Introduce IEP concept.
- Highlight IEP achievements.
- Evaluate the interest of FPCCI in IEP.
- Encourage/ensure participation of federation in the conference proposed to be held in February 1994.
- Obtain information regarding members of federation.

**Summary:**

A meeting with the Secretary General of Federation of Pakistan Chamber of Commerce and Industry (FPCCI) was held for the above said objectives. The discussion was opened by Mr. Assad Bukhari who outlined the objectives of the meeting and elaborated on various aspects of IEP. The response of the Secretary General was very encouraging who assured all possible assistance provided the objectives remain in the interest of the private sector. The Secretary General mentioned that FPCCI was already providing R & D services of foreign consultants to its members which were being financed by the individuals country.

In this regards he suggested that a written summary of IEP, including the background and the present status, may be extended to him to enable FPCCI to evaluate the extent and nature of their participation in promotion of private sector and research institution cooperation. He also provided information regarding the office bearers and the interests of FPCCI.

**EDC Comment:**

FPCCI was informed that a conference for the promotion/sustainability of IEP concept is proposed to be held in the 2nd week of February 1994 and is likely to be inaugurated by the Prime Minister.

FPCCI was also informed that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

FPCCI in the light of its experience with other donors as mentioned above seem willing to play a catalytic role for institutionalization of the IEP concept. We feel that they may be even willing to become the focal point for such an institutional frame work. However a final decision on the subject would be taken by them in the light of the proceedings/results of the said conference in February 1994.

**Date:** December 29, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Electrical Engineering, University of Engineering and Technology, Lahore.

**Participants:**

**EDC**

Dr. Salman A. Malik      Consultant

Mr. M. Zubair              Consultant

**UET**

Dr. Zubair A. Khan      Professor & Principal Investigator

**Objectives:**

- Evaluation of progress.
- Provide Guidance/Assistance in solution of problems still persisting.
- Discussion of conference to be held in February 1994.

**Summary:**

Progress of the three USAID-IEP projects was discussed. Dr. Zubair elaborated on all the issues raised by the EDC representatives and provided information regarding the progress made and the difficulties being encountered. He assured that the projects would be completed within the stipulated time. He also provided the receipts for adjustment of previous advance received.

**Progress:**

**Project 1**

**Microprocessor Based Multimetering, Energy & Tariff Meter:**

As reported earlier. The logic analyzer has been posing problems which have still not been rectified completely. Efforts are continuing to overcome the problems and develop a prototype by/before the conference in February.

**Project 2**

**Design & Development of an Expert Logic Controller:**

As reported earlier the hardware is reported to have been developed but the software has not been completed. Work on development of software is in progress. There is hope that a prototype may be developed by/before the conference in February.

**Project 3**

**Uninterrupted Power Supply (UPS):**

As reported earlier, a prototype had been made which required improvement and testing. The desired improvement is reported to have been made and Multi Line has shown interest in acquiring this technology. The prototype is likely to be further improved and tested thoroughly before the conference.

**Related information:**

**Meetings of faculty/industrial staff:**

- Infrequent, only when required, no regular pattern.

**Problem encountered/reported:**

- Difficulty in engaging the desired skilled help.
- Equipment received still not fully functional.

**Suggestions/Recommendations:**

- Installation/correction of provided equipment on priority basis.
- Engaging new/more skilled assistance.

**EDC Comment:**

It was stressed that every effort be made to complete the research work by the end of January 1993.

Dr. Zubair was requested to provide the script of the workshop presentation at an early date.

Dr. Zubair was also informed that the proposed conference would be held in the 2nd week of Feb. 1994 and is likely to be inaugurated by the Prime Minister.

Dr. Zubair was also informed that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

The counterparts namely Mr. Kamaluddin from DESCON and Mr. Zubair from Multiline were contacted on 30th December 1993.

They were aware of the progress made as well as the problems being encountered by UET. However formal exchange of views/communication was reported to be still lacking and no interim reports were being provided to the counterparts regarding the progress made or procedures adopted to over come the problems.

Mr. Zubair of Multiline showed interest in obtaining the technical information related with the improvements made by UET in the UPS and wanted EDC representatives to arrange for it. It was understood that UET may be willing to furnish the desired information provided some kind of a formal arrangement is made between the two parties. In this respect both the parties were advised to meet with each other and try to settle a deal amongst themselves. However assistance/advise was assured to them only if felt necessary after the advised meeting amongst themselves.

Dr. Ainuddin of Escorts, was contacted on 30th December 1993 & 2nd January 1994. Unfortunately he was not available in the office and therefore his views could not be obtained.

**Date:** December 30, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Centre of Excellence in Molecular Biology (CEMB), University of the Punjab, Lahore.

**Participants:**

**EDC**

Dr. Salman A. Malik            Consultant

Mr. M. Zubair                 Consultant

**CEMB**

Dr. Raiz ud Din                Director & Principal Investigator

Ms. Esther Khan                Lecturer & Co-Principal Investigator

Dr. Amin Ather                 Assistant Professor & Co-Principal Investigator

**Objectives:**

- Evaluation of progress.
- Provide Guidance/Assistance in solution of problems still persisting.
- Discussion of conference to be held in February 1994.

**Summary:**

Progress of the two USAID-IEP projects was discussed. Both projects were discussed at length including the progress made so far, the problems encountered and their possible solutions.

**Progress:**

**Project 1**

**"Microbial Control of Insect Pests in Cotton:**

As reported earlier there has been significant progress and the initial work has been completed. Some evaluation of activity has been made in collaboration with CIBA GIEGY. The summary of results of these studies were provided to EDC preventatives. In these studies the efficacy of the culture has been tested on neutrally infected potato fields in comparison with other bio-insecticide developed by CIBA GIEGY. These results appear to be very promising.

**Project 2**

**"Hormone Receptors as Prognostic Factors in Health & Disease:**

As reported earlier the initial work has been done but further progress is being hampered by the delay in the supply of commodities. It was understood from discussions that if the commodities may be supplied expeditiously, significant work may still be completed and result presented in the proposed conference in February 1994.

**NOTE:**

Meetings of faculty/industrial staff:

- Frequent, as and when required, no regular pattern.

Problems encountered/Reported:

- Some chemicals/commodities still awaited.

Suggestions/recommendations:

- Expeditious supply of chemicals/commodities.
- More field trials to be conducted on other similar pests.

**EDC COMMENT:**

It was stressed that every effort be made to complete the research work by the end of January 1994.

CEMB was requested to provide the script of the workshop presentation at an early date.

CEMB was also informed that the proposed conference would be held in the 2nd week of Feb. 1994 and is likely to be inaugurated by the Prime Minister.

CEMB was also informed that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

CIBA GIEGY, Multan and Lahore who are the Industrial counterparts of project No. 1 i.e. "Bio-Insecticides" were approached on 1-1-1994 and 2-1-1994 respectively. Although both were informed of the visit earlier and Ciba Giegy, Multan had even confirmed their availability nevertheless a meeting in person could not be held since the concerned officers were not present in the office. Ciba Giegy, Lahore had very recently shifted their office without intimation to us or CEMB, therefore they did not receive our intimation in time. Their new location was however found after considerable effort but unfortunately Mr. M. Sabir had taken that day off due to ill-health. The matter was discussed with him on the telephone at his residence. He assured continued and enthusiastic cooperation in the project and appeared fully satisfied with the progress made so far.

Punjab Drug House, (P.D.H.) Lahore who are the industrial counterparts of project No. 2 i.e. "Hormone Receptor Kits" were approached on 2-1-1994 after making an arrangement on telephone. Sheikh Muhammad Ilyas the Director of P.D.H. expressed continued interest in the project and assured all possible assistance in this respect. However Dr. Mahmood Alam who is reported to be the dealing officer for this project could not unfortunately attend the meeting due to ill-health. Therefore detailed view on the project could not be obtained from their side.

**BRIEFING ON**  
**INSTITUTIONAL EXCELLENCE PROJECT (IEP)**

**SUBMITTED TO**  
**UNIVERSITY GRANTS COMMISSION**  
**AND**  
**MINISTRY OF EDUCATION**

**FUNDED BY:** UNITED STATES AGENCY FOR INTERNATIONAL  
DEVELOPMENT (USAID) MISSION FOR PAKISTAN AND  
AFGHANISTAN

**ASSISTED BY:** ENTERPRISE & DEVELOPMENT CONSULTING (EDC)

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**UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)  
INSTITUTIONAL EXCELLENCE PROJECT (IEP)  
AT A GLANCE**

Research Institution	Counter-parts	Number of Projects	Total Amount of Commodity Funding (US \$)	Total Amount of R&D Funding (Rs.)	Amount utilized to date (Rs.)	Remarks
NCEG, Peshawar	OGDC Khawaja Glass Co.	Four	247,376	1,058,376	830,512	All four projects more or less complete
QAU, Islamabad	Bio-Tech Ciba Giegy, Multan	Two	136,115	376,476	230,419	One doing very well One behind schedule
UET, Lahore	Descon Escorts Multiline	Three	89,474	449,244	146,000	One doing very well Two satisfactory
CEMB, Lahore	Ciba Giegy, Lahore Punjab Drug House	Two	193,600	375,450	247,795	One doing very well One behind schedule
Gomal, D.I.Khan	PCSIR STEDEC	Two	133,300	425,510	171,073	One academically complete One satisfactory
HEJ, Karachi	Hamdard Labs. Ehsanullah Labs. A.K. Labs.	Three	211,420	218,196	176,699	One doing very well One satisfactory One behind schedule
<b>Grand Total</b>						
6	14	16	1,011,285.00	2,903,252	1,802,498	9 doing very well 4 satisfactory 3 behind schedule

## INTRODUCTION

### **OBJECTIVES AND BACKGROUND:**

The Institutional Excellence Project (IEP) was originally envisaged as a ten year, \$80 million program to identify and strengthen selected university departments and centers identified as important to the future economic development of Pakistan. With the imposition of Pressler restrictions in October 1990, both the time frame and the budget of the project was sharply reduced to less than 10% of that originally envisaged. The major goals of the existing project have been:-

- To prepare each of the units to interact productively with industry, primarily in the private sector
- To introduce indigenous and new economically important technology through research by universities and other research institutions of Pakistan.
- To strengthen their research capabilities so that they can provide effective technical assistance and advice to Pakistani industries
- To establish the credibility of the research institutions and centers for carrying out applied research.

In the initial stages of the project, the research institutions and centers were identified and partial assessments were conducted to determine how best their research capabilities could be strengthened and how they could provide technical assistance and advice to Pakistani industries. The assessments focused upon applied research and technology, and technology transfer from the research institutions to indigenous Pakistani industries.

### **APPROACH:**

To test the capability of research institutions and centers to provide solutions to industrial problems and the effectiveness of their interaction with industry, cooperative applied research projects were established between industrial companies and selected research institutions and centers. The industries identified problems for which solutions were needed for immediate application to their industrial processes. The projects were based on proposals jointly developed between the cooperating industries and the research institutions and centers selected for supporting the technology transfer.

To assist in the implementation of the project, a Pakistani consulting firm was employed. They were to provide continuous assistance in identifying and facilitating cooperative arrangements with companies, monitoring of research activities, analysis of the economic importance of results, and presentation of final project results to the Pakistani community. The contract with the firm came to an end early last year. Since the intent was to continue the support services to

these projects in a similar manner in the coming year beyond the level where the projects stood at the time a new contracting firm has been employed. Consultant assistance will be continued through out the life of the institutional excellence project.

#### **SUMMARY OF ACTIVITY:**

Beginning in May 1992, sixteen projects were initiated between six university departments and centers with fourteen cooperating industrial companies, all but two of which are in the private sector. All the approved projects were envisaged to be of short duration and were expected to yield results of applicable value within one to two years. Projects were funded through Memoranda of Understanding signed in May and June, 1992 after which work on the projects began. Since then all the projects have been regularly monitored for evaluation of progress made and problems encountered. To enhance the concept of IEP and to provide an opportunity of a collective dialogue to all participants of IEP a two day workshop was held in November 1993. The objectives and the achievements of the workshop are attached as Annexure 1 & 2 respectively. Preparations are underway to hold the IEP conference in mid-February 1994 to present the results of these projects to senior level government officials, chambers of commerce officials, industrialists, and donor agency personnel to pave the way for continued university/industry collaboration.

#### **SUMMARY OF DESCRIPTION & STATUS OF PROJECTS:**

Although there was diversity in the subjects and a variety of different products which were to be developed (Annexure 3), there were three common features shared by all the projects:

- i. They all had great promise of economic benefits,
- ii. The products were envisaged to be developed within the stipulated time frame,
- iii. The results obtained would have immediate applicable value.

According to the rate of progress made so far through the demonstration of potential economic value and promise of successful completion, the projects may be placed in 3 classes (Annexure 4).

- i. Very well
- ii. Satisfactory
- iii. Behind Schedule

All the projects placed in class "very well" are those which have made significant progress. The Principal Investigator(s) have been able to complete the work on the laboratory scale and have been able to report the laboratory scale work results. The only work these projects require is either up-grading the scale of production or more intensive field trials, but in principle these have already produced products or results of applicable value.

The projects in class "satisfactory" have made progress but the principal investigator(s) have not been able to complete their laboratory scale work as yet. However these projects promise completion within the earlier prescribed time.

The projects in class "behind schedule" have promise of success but these might not be completed fully as envisaged earlier. However some parts of these would be completed and are likely to have potential economic value. Work on these projects has been seriously hampered due to improper shipment of sensitive chemicals and delay in their replacement by the supplier. Other problems experienced during the course of IEP and their possible solutions are attached as annexure 5 and 6 respectively. A detailed description of the present status of these projects individually is attached as annexure 7.

## **ACHIEVEMENTS OF IEP**

The measurable achievements made so far through IEP are:

- Improved physical capabilities of selected participating departments to engage in industrial cooperative research.
- Trained skilled man power.
- Established credibility of universities capabilities in industrial research.
- Focused the attention of research institutions on production of commercial products or processes.
- Highlighted the importance and benefits of cooperative work with private sector companies.
- Learned through experimentation the problems associated with such cooperative applied research work and their plausible solutions.
- Provided a model for a sustainable system for continuation of research sector/private sector applied research cooperation using IEP structure.

## **SUSTAINABILITY**

Despite the fact that IEP has achieved so much in such a short span of time, it is still in its infancy. The project concept will need to be supported for some time, in order for it to become sustainable. The needed support can be summarized as:

- **Institutional requirements.** We need to work for the establishment of an institutional network which can work as a catalyst for the continuation and expansion of the project activities. This institutional network will need the active participation of the representative bodies of the research institutions such as the **University Grants Commission (UGC)** and the private sector such as the **Federation of Pakistan Chambers of Commerce and Industries (FPCCI)**.

- **Financial Support** The financial needs and their sources can be estimated by the relevant government institutions after the completion of the revised and expanded project concept resulting from the February 1994 conference recommendations.
- **National Steering committee** It is suggested that a steering committee should be formed based on the February 1994 conference recommendations to oversee the work for formulating the establishment of the institutional network. The steering committee should be chaired by the Honorable Ms. Shehnaz Wazir Ali, Advisor to the Prime Minister on the Social Sectors. The suggested membership of the committee should include but not be limited to:

President Federation of Pakistan Chambers of Commerce and Industry (FPCCI)  
University Grants Commission (UGC)  
Economics Affairs Division (EAD)  
Ministry of Planning  
Ministry of Education  
Private Sector Consultants (such as Enterprise & Development Consultants (EDC) which has assisted with IEP's implementation)

## **OBJECTIVES OF THE IEP WORKSHOP HELD IN NOVEMBER 1993**

### **EVALUATION**

- Of the overall degree of success of the projects.
- Of enthusiasm & interest of the industrial participants for continuing such cooperative efforts.
- Of suggestions/recommendations that may be proposed during the November, 1993 workshop.

### **CONFIDENCE BUILDING & LEARNING**

- Enhancing confidence between research institutions, industry and the IEP program by providing an opportunity for a collective dialogue.
- Learning from each others' experience.

### **PREPARATION FOR FUTURE ACTIVITIES**

- To plan and prepare for the formal conference to be held in February 1994.
- To define themes and establish a structure for presentations, discussions and a preliminary agenda.
- To define and establish an outline of the IEP manual to be published.

**WORKSHOP ACHIEVEMENTS**  
(NOVEMBER 1993)

It emerged as a consensus view that:

- The objectives set forth for the project have been accomplished to a major degree.
- Credibility of the research institutions for carrying out applied research has been established.
- Alternate mechanisms for continuing such cooperative applied research activities have been identified.
- A high level of participation and enthusiasm has been achieved in the project activities.
- All participants have expressed enthusiasm about continuing cooperative applied research activities.
- The project operational manual outline was reviewed and discussed.
- Planning for the conference was initiated and commitment by the industrial participants was obtained.
- The problems encountered by both the groups was evaluated. Effort was made to find solutions for these problems.

## **SUBJECT-WISE CLASSIFICATION OF PRODUCTS**

1. ENZYMES FOR LEATHER PROCESSING
2. BIO-INSECTICIDES
3. BIO-MEDICAL PRODUCTS
4. ELECTRONIC PRODUCTS
5. GEOLOGY
  - GLASS PRODUCTION
  - PETROLEUM EXPLORATION

## PROGRESS-WISE CLASSIFICATION OF THE PROJECTS

### VERY WELL

Improvements in Analytical Processes	NCEG
Silica Sources	NCEG
Sedimentology of Kohat Basin	NCEG
Inclusion Problems in Glass Manufacturing	NCEG
Bating Enzymes	QAU
Uninterrupted Power Supply Unit (UPS)	UET
Bioinsecticides	CEMB
Antidiabetic Compounds	HEJ
Anticancer Compound	GOMAL

### SATISFACTORY

Multimetering, Energy & tariff Meter	UET
A.C. Motor Controller	UET
Bating Enzymes	HEJ
Natural Insecticide	GOMAL

### BEHIND SCHEDULE

Bioinsecticides	QAU
Diagnostic Kits	CEMB
Diagnostic Kits	HEJ

## **LIST OF PROBLEMS WHICH EMERGED IN THE NOVEMBER 1993 WORKSHOP**

We would like to mention that most of the problems listed below have been solved with the joint efforts of all the project participants. These problems are being listed for future reference by the participants of any similar initiatives.

### **IE PROJECT PROBLEMS**

- Progress Reports (Frequency and Completeness) were unsatisfactory.
- Contact with industrial counterparts/level of contacts/reports/frequency was not adequate.
- High priority to project activities was not given by the administrators.
- Timeliness of projects, scheduling and completion needed improvement.
- Financial management sometimes caused constraint.

### **USAID PROBLEMS**

- Slow processing of Memorandum of Understanding (MOU).
- Late Delivery of commodities.
- Incomplete delivery of commodities.
- Improper packing of sensitive items.
- Interruption of consultant service.

### **USAID/UNIVERSITY PROBLEMS**

- Slow determination of commodity specifications.
- Inadequate understanding of USAID rules/operating procedures.

### **INDUSTRY PROBLEMS**

- Confidence level less than desired.
- Intellectual rights not assured.
- Timeliness not given a priority.

**LIST OF SUGGESTIONS  
WHICH EMERGED FROM THE NOVEMBER 1993 WORKSHOP**

**RESEARCH FUNDING/MANAGEMENT**

- Provision of funds in a timely manner by all future donor/sponsoring agencies.
- Identification and reservation of funds for research purposes.
- Publicity of funds available by all future donor/sponsoring agencies.
- Funding for research students to be made available.

**INCENTIVES**

- Incentives for research productivity should be incorporated.
- Positive merit award for research accomplishments should be incorporated.
- Rules for consultancy should be improved/modified to encourage research institution industry cooperation.

**INFRASTRUCTURE**

- Improved infrastructure for research activities.
- Strong focus on external research.
- Identification of national scientific and technological priority.
- Maintenance of equipment (spare parts/service) to be improved.
- Technical staff (service) to be expanded.
- Applied education at undergraduate level to be extended.

**DETAILED DESCRIPTION OF STATUS OF PROJECTS IN PROGRESS**

**Research Institution:** National Centre of Excellence in Geology (NCEG)  
University of Peshawar

**Total Projects:** Four

<b>Fund Allocation</b>	<u>Res. &amp; Dev.</u>	<u>Commodities</u>	<u>Total (US\$)</u>
	42,200	247,376	289,576

**Project No. 1**

**Title:** Identification & Characterization of Quality of Silica Sand Resources for Glass Making:

**Personnel Engaged:**

Dr. M. Qasim Jan	-	Principal Investigator
Dr. S. Hameed Ullah	-	Co-Principal Investigator
Dr. M. Asif Khan	-	Co-Principal Investigator

**Cooperating Industry:**

Khawaja Glass Company

**Objective:** The objective of this project was to study & recommend alternate sites for procuring quality silica sand for the manufacture of glass.

**Status:** It has been reported that several known silica sand deposit sites have been studied/evaluated for quality of silica sand and the size of the deposit. Initial recommendations have been made to the respective industrial counterpart. Further work involving more extensive analyses and still more sites is under way. It is expected that final recommendations would be available before/by the conference in February 1994.

**Project No. 2**

**Title:** Inclusion Studies of Sheet Glass:

**Personnel Engaged:**

Dr. M. Qasim Jan	-	Principal Investigator
Mr. Barkatullah	-	Research Associate

Cooperating Industry:

Khawaja Glass Company

Objective: The objective of this project was to study the inclusion bodies present in the glass samples and indicate possible corrective recommendations.

Status: It has been reported that the research work has been more or less completed. The results of detailed analyses of the inclusion bodies are being assimilated. The final report of this project is expected to be submitted to the counterpart for their evaluation/implementation before/by the end of January 1994.

**Project No. 3**

Title: Review of Analytical Processes at Khawaja Glass Company:

Personnel Engaged:

Dr. M. Qasim Jan	-	Principal Investigator
Dr. M. Tahir Shah	-	Co-Principal Investigator
Mr. Mumtaz Khan	-	Research Assistant

Cooperating Industry:

Khawaja Glass Company

Objective: The objective of this project was to develop/propose cost effective but reliable and time saving alternate methods for making routine analysis in the quality control laboratory, at Khawaja Glass Company (KGC). In addition to make recommendations for improving the efficiency of the quality control labs., at KGC.

Status: It has been reported that the research work has been completed and an initial report pertaining to such alternate methods/recommendations has already been made to the counterpart which is being considered for implementation by KGC. Final report of the work/results is expected to be completed before/by the conference in February 1994.

**Project No. 4**

**Title:** Sedimentological Studies in Potential Hydrocarbon-bearing Strata:

**Personnel Engaged:**

Dr. M. Qasim Jan	-	Principal Investigator
Dr. Saifullah Khan	-	Co-Principal Investigator
Dr. Iftikhar Abbasi	-	Co-Principal Investigator
Mr. Obaid-ur-Rahman	-	Research Associate
Mr. M. Riaz	-	Research Associate

**Cooperating Industry:**

Khawaja Glass Company

**Objective:** The objective of this project was to carry out sedimentological studies in potential hydrocarbon-bearing strata of Kohat basin to help OGDC in their oil exploration efforts.

**Status:** It has been reported that the project has been successfully completed and a detailed report has already been submitted to OGDC and USAID. It may be added that OGDC representative have commended the work/report of NCEG.

**Research Institution:** Department of Biological Sciences  
Quaid-i-Azam University, Islamabad.

**Projects:** Two

<b>Fund Allocation</b>	<b><u>Res. &amp; Dev.</u></b>	<b><u>Commodities</u></b>	<b><u>Total (US\$)</u></b>
	14,444	136,115	150,559

**Project No. 1**

**Title:** Bating Enzymes from Animal Sources:

**Personnel Engaged:**

Dr. Abdul Hameed	-	Principal Investigator
Ph.D. Scholar	-	Research Associate

**Cooperating Industry:**

Biotechnology Ltd.

**Objective:** The objective of this project was to provide the national leather industry with a locally prepared, cost effective, quality bating enzyme from microbial sources.

**Status:** It has been reported that all the laboratory scale work has been completed and the procedures have been standardized. The results of laboratory scale work were reported to be very promising both in terms of economic value and the quality of final product obtained. Bulk production of the enzyme is underway which would be supplied to the industrial counterpart for their evaluation. The final report of the project is expected to be completed before/by the conference in February 1994.

**Project No. 2**

**Title:** Bioinsecticides in the Control of Insect Pests of Cotton:

**Personnel Engaged:**

Dr. Khalida Sultana	-	Principal Investigator
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**Cooperating Industry:**

Ciba Geigy Corporation.

**Objective:** The objective of this project was to provide a locally prepared, cost effective, broad based/broad spectrum bioinsecticide which may supplement/substitute the chemical insecticides. In addition a cost effective, quality medium for propagation of the microbes was also to be developed.

**Status:** It has been reported that certain microbes possessing insecticidal activity have been isolated and characterized. The results obtained so far are promising. Further work involving synergistic action of a mixture of these microbes is under way. More meaningful results may be obtained/presented during the conference in February 1994. This project is being carried out in association with Center of Excellence in Molecular Biology (CEMB), University of the Punjab, Lahore.

**Research Institution:** Electrical Engineering Department  
University of Engineering & Technology (UET), Lahore

**Projects:** Three

<b>Fund Allocation</b>	<u>Res. &amp; Dev.</u>	<u>Commodities</u>	<u>Total (US\$)</u>
	16,800	89,474	106,274

**Project No. 1**

**Title:** Microprocessor based Multimetering, Energy & Tariff Meter:

Personnel Engaged:

Dr. Zubair A. Khan - Principal Investigator  
Two Graduate Scholars - Research Associate

Cooperating Industry:

Escorts, Ltd.

**Objective:** The objective of this project was to develop a cost effective & reliable /multimetering energy and tariff meter using components readily available in the local market.

**Status:** The research work has been reported to be near completion whereafter a prototype would be assembled and provided to the industrial counterpart for their evaluation. To this prototype more functions may be added as and when required. The final report of the project is expected to be completed before/by the conference in February 1994.

**Project No. 2**

**Title:** Design & Development of an Expert Logic Controller:

Personnel Engaged:

Dr. Zubair A. Khan - Principal Investigator  
Two Graduate Scholars - Research Associate

Cooperating Industry:

Deseon, Ltd.

**Objective:** The objective of this project was to develop a reliable and cost effective A.C. motor controlling system in accordance with the needs of the national industries using components readily available in the local market.

**Status:** It has been reported that a design for such a system has been developed and a prototype is likely to be assembled soon. Which after evaluation of its performance at laboratory scale would be provided to the industrial counterpart for their evaluation. Efforts are being made to prepare the prototype before/by the conference in February 1994.

### **Project No. 3**

**Title:** Uninterrupted Power Supply (UPS):

**Personnel Engaged:**

Dr. Zubair A. Khan	-	Principal Investigator
Two Graduate Scholars	-	Research Associate

**Cooperating Industry:**

Multiline, Inc.

**Objective:** The objective of this project was to develop a cost effective and reliable UPS system using indigenous technology or basic materials/components readily available in the local market.

**Status:** It has been reported that the initial research work has been completed and a prototype is being assembled. Multiline has already evaluated the performance of some of the components being used in the assembly of the said prototype and have found these to yield better results compared to the existing UPS in the market. They have shown interest in acquiring this technology and negotiations in this respect are reported to be in progress. The final report of this project is expect to be ready before/by the conference in February 1994.

**Research Institution:** National Centre of Excellence in Molecular Biology (CEMB)  
University of Punjab, Lahore

**Projects:** Two

<b>Fund Allocation</b>	<u>Res. &amp; Dev.</u>	<u>Commodities</u>	<u>Total (US\$)</u>
<b>Project No. 1</b>	15,000	193,600	208,600

**Title:** Microbial Control of Insect Pests in Cotton:

Personnel Engaged:

Dr. S. Riazuddin	-	Principal Investigator
Ms. Esther Khan	-	Co-Principal Investigator

Cooperating Industry:

Ciba Giegy Corporation.

**Objective:** The objective of this project was to provide a cost effective but potent bioinsecticide to supplement/substitute the chemical insecticides against cotton boll worm. In addition a cost effective, quality medium for propagation of the microbe was also to be developed.

**Status:** It has been reported that the laboratory scale work has been completed. The microbe possessing acute insecticidal activity has been successfully propagated in significant quantities in a very economical medium developed at/by CEMB. Potency of the culture has been evaluated on a small scale in collaboration with Ciba Giegy on naturally infested potato fields and the results are reported to be very promising. Large scale field trials are now being planned. In addition work on increasing the efficacy and half life of the bioinsecticide is underway.

**Project No. 2**

**Title:** Hormone Receptors as Prognostic Factors in Health & Disease:

Personnel Engaged:

Dr. S. Riazuddin	-	Principal Investigator
Dr. Amin Ather	-	Co-Principal Investigator

Cooperating Industry:

Punjab Drug House.

**Objective:** The objective of this project was to develop a cost effective and reliable assay kit for an early evaluation of cancer risk to the subject due to hormonal imbalance.

**Status:** It has been reported that some initial work has been completed and further work is under way. More meaningful results may be obtained/presented during the conference in February 1994. The work on this project is likely to continue even after the end of IEP before complete results may be obtained.

**Research Institution:** Gomal University, D.I.Khan

**Projects:** Two

<b>Fund Allocation</b>	<u>Res. &amp; Dev.</u>	<u>Commodities</u>	<u>Total (US\$)</u>
	17,000	133,300	150,300

**Project No. 1**

**Title:** Commercial Exploitation of Taxol Anti-Cancer Drug:

Personnel Engaged:

Dr. G.A. Miana - Principal Investigator

Cooperating Industry:

PCSIR, Laboratories

**Objective:** The objective of this project was to economically extract "Taxol" from Taxus baccata and study its anticancer activity. Taxol is reported to contain anticancer activity.

**Status:** It has been reported that extracts from Taxus baccata leaves have been studied but no "Taxol" could be detected. Preparations for a more extensive study using leaves & other parts of the tree are under way and more meaningful results are expected to be obtained /presented during the conference in February 1994. This project seem unlikely to yield results of applied/economic value, atleast within the scope of IEP, however the results would still have their academic value.

**Project No. 2**

**Title:** Commercial Exploitation of Azadirachtin:

Personnel Engaged:

Dr. G.A. Miana - Principal Investigator

Cooperating Industry:

PCSIR, Laboratories  
STEDEC

**Objective:** The objective of this project was to prepare a cost effective and potent pest repellent from neem seeds.

**Status:** It has been reported that the laboratory scale work has been successfully completed. The active compound "Azadirachtin" has been extracted using various solvents. Some field trials on sunflower fields have been conducted and all extracts have been found to have potency. The results with ethanol extract are promising. Arrangements for bulk extraction are being made whereafter large scale field trails may be possible. Efforts are being made to complete bulk scale extraction/large scale field trails before/by the conference in February 1994.

**Research Institution:** H.E.J. Research Institute of Chemistry  
University of Karachi

**Projects:** Three

<b>Fund Allocation</b>	<u>Res. &amp; Dev.</u>	<u>Commodities</u>	<u>Total (US\$)</u>
	8,700	211,420	220,120

**Project No. 1**

**Title:** Investigation of Medicinal Plants for Anti-diabetic Activity:

Personnel Engaged:

Dr. Atta-ur-Rehman	-	Principal Investigator
Dr. M. Iqbal Chaudhry	-	Co-Principal Investigator
Mrs. Rahat Azhar Ali	-	Research Fellow
Ms. Shamsa	-	Research Fellow

Cooperating Industry:

Hamdard Laboratories.

**Objective:** The objective of this project was to determine efficacy of the various anti-diabetic formulations prepared by Hamdard Laboratories Pakistan and to identify the potent ingredient(s) in such formulations. In addition to verify the anti-diabetic potency of some other herbs commonly assumed to have such efficacy and also to provide an improved formulation on the basis of the findings.

**Status:** It has been reported that out of five formulations commonly prescribed only two have positive potency, two have no potency and one has negative potency. It has also been reported that on the basis of these results and in accordance with the recommendations of HEJ, Hamdard Laboratories have already advised their practitioners to prescribe only the two positive potency containing formulations hence forth.

It has been reported that no hypoglycemic activity could be detected in the isolated fractions of these two formulations, however the anti-diabetic potency in four herbs used in these formulations has been observed. On the basis of these findings an improved formulation is reported to be in preparation from these four and some other herbs found to have potent hypoglycemic activity. This formulation is expected to be ready and evaluated for activity/toxicity before/by the conference in February 1994. Further work in collaboration with Hamdard laboratories on the project is reported to continue even after the termination of IEP.

## **Project No. 2**

**Title:**        Bating Enzymes from Animal Sources:

**Personnel Engaged:**

Dr. Zafar Zaidi	-	Principal Investigator
Dr. Attiya Abbasi	-	Co-Principal Investigator

**Cooperating Industry:**

Biotechnology Ltd.

**Objective:**    The objective of this project was to provide the national leather industry with a locally prepared, cost effective, quality bating enzyme from pancreas.

**Status:**        It has been reported that the initial work has been completed and crude/partially purified material has been obtained which still requires to be evaluated for activity and the quality of final product.

## **Project No. 3**

**Title:**        Development and Pilot Plant Production of Medical Diagnostic Kits.

**Personnel Engaged:**

Dr. Zafar Zaidi	-	Principal Investigator
Dr. Attiya Abbasi	-	Co-Principal Investigator

**Cooperating Industry:**

Ehsanullah Laboratories.  
A.K. Laboratories.

**Objective:**    The objective of this project was to prepare cost effective and reliable assay kits for routine clinical analyses.

**Status:**        It has been reported that some of the initial work has been completed and further work is under way. A few enzyme-based kits, used most frequently in routine clinical analyses may be prepared by/before the conference in February 1994.

# **INSTITUTIONAL EXCELLENCE PROJECT**

## **Project Monitoring & Evaluation Report**

Number: 3

*Submitted*

*To*

**United States Agency for International Development  
Islamabad**

**By**

**EDC (Pvt) Limited**  
Enterprise & Development Consulting

**Authors: Dr. Salman A. Malik  
Mr. Assad Bukhari**

**Date:** January 20, 1994  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** National Center of Excellence in Geology (NCEG); University of Peshawar.

**Participants:**

**USAID**

Ms. Amna Mir                      Project Officer

**EDC**

Mr. Assad A. Bukhari              Project Manager

Dr. Salman A. Malik              Consultant

**UGC**

Dr. M.H. Qazi                      Member, Whole Time

**NCEG**

Dr. Qasim Jan                      Director & Principal Investigator

Dr. Tahir Shah                      Assistant Professor & Co-Principal Investigator

Dr. Hamidullah                      Assistant Professor & Co-Principal Investigator

Dr. Iftikhar Ahmad                      Assistant Professor & Co-Principal Investigator

Mr. Mohammad Riaz                      Research Associate

**Objectives:**

- Discussion of conference to be held in 2nd week of February 1994 at Islamabad.
- Evaluation of progress made so far.

- Evaluation of prospects and the extent of completion of the projects before the said conference.
- Provide further guidance in preparation of the posters for the poster session proposed to be organized concurrently with the said conference.
- Seek commitment of enthusiastic participation in the said conference & the poster session.
- Provide Guidance/Assistance in solution of problems still persisting.

**Summary:**

Progress of all the four USAID-IEP Projects was discussed in detail. Dr. Qasim Jan opened the discussion with general remarks followed by the details of individual projects by the respective co-principal investigators. It was reported that work on all the projects has been completed.

**Progress:**

**Project 1**

**Identification & Characterization of Quality of Silica Sand Resources for Glass Making:**

It was reported that analysis of all samples totalling more than 50 have been completed and a formal report was being prepared. An initial draft of the report was presented and discussed. It was observed by Dr. M.H. Qazi and agreed to by all participants that the contents of the report were good. It was suggested that an advance copy of the findings should be provided on priority to the industrial counterpart for their consideration and evaluation. It was assured that the same would be done within four days.

**Project 2**

**Inclusion Studies of Sheet Glass:**

It was reported that all experimental work has been completed and a report is being compiled. The results and extracts of script were presented and discussed. It was a consensus view that the results were satisfactory and objectives as envisaged in the scope of work have been achieved. Dr. Qasim Jan assured that a complete draft of the report would be prepared and presented to the industrial counterpart within one week for their consideration and evaluation.

### Project 3

#### Review of Analytical Processes at Khawaja Glass Company:

It was reported that the work on this project has also been completed. A formal report was presented and discussed. As a consensus view the contents were found to be good. A few improvements/refinements were however suggested to be incorporated which were agreed to and appreciated by NCEG. It was also reported that extracts of the report have already been provided to the industrial counterpart as advance copy for their consideration. Their views /comments had however not been received but were expected soon.

### Project 4

#### Sedimentological Studies in Potential Hydrocarbon bearing Strata:

It was reported that the project had been completed for some time now. It was reiterated that a copy of the final report had already been provided to USAID and OGDC. The same was presented to the participants and details of its contents and work done were described. It was again reiterated that the work has been commended by OGDC. It was also the consensus view that the objectives of the project had been fully accomplished. NCEG was requested to prepare a summary of these findings for presentation in the national conference.

### **Related Information:**

It was stressed that every effort be made to provide the results of the completed research work to the industrial counterpart before the end of January 1994.

NCEG was informed that the proposed national conference would be held in the 2nd week of February 1994 and was likely to be inaugurated by Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister.

NCEG was reminded that there would be a poster session at the conference to facilitate the participants in publicizing their institutional facilities/expertise/achievements. They were requested to prepare posters for the same.

The industrial counterpart of NCEG i.e. Khawaja Glass Company (KGC) were invited to attend the meeting but they could not participate and their view could not be obtained. KGC were however contacted by telephone to obtain their view of the project. It was understood that the relationship between the two counterparts have improved significantly since the workshop. However, further increased communication/coordination was desired.

**Date:** January 30, 1994  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Electrical Engineering, University of Engineering and Technology, Lahore.

**Participants:**

**USAID**

Ms. Amna Mir Project Officer

**EDC**

Mr. Assad A. Bukhari Project Manager

Dr. Salman A. Malik Consultant

**MOE**

Mr. Munir Ahmad Joint Educational Advisor, Planning & Development

**UET**

Prof. A. Hameed Chairman, Dept. of Elect. Engg.

Dr. Zubair A. Khan Professor & Principal Investigator

Mr. Khalid Munawar Research Associate

**Multiline**

Mohammad Zubair Director

**Descon**

Dr. Kamal Ahmad Advisor Product Engg.

**Objectives:**

- Discussion of conference to be held in 2nd week of February 1994 at Islamabad.
- Evaluation of progress made so far.

- Evaluation of prospects and the extent of completion of the projects before the said conference.
- Provide further guidance in preparation of the posters for the poster session proposed to be organized concurrently with the said conference.
- Seek commitment of enthusiastic participation in the said conference & the poster session.
- Provide Guidance/Assistance in solution of problems still persisting.

**Summary:**

Progress of the three USAID-IEP projects was discussed. Dr. Zubair reported that the lab. scale work on all the projects has been completed. The prototype models of the three products were presented and their function demonstrated. All the models worked perfectly during the demonstration. It was reported that all the models have been developed in accordance with the objectives of the projects. It was a consensus view that this was a significant achievement.

**Progress:**

**Project 1                      Microprocessor based Multimetering, Energy & Tariff Meter:**

As stated earlier a prototype model of the energy and tariff meter has been assembled and would be presented in the conference in February 1994. It was also reported that a variety of additional features may be added to this prototype through indigenously improvised technology as and when required.

**Project 2                      Design & Development of an expert logic controller:**

As stated earlier a prototype model of the logic controller has been developed and would be presented in the conference in February 1994. It was also reported that an industrial/commercial scale model may be now assembled using the same design.

**Project 3                      Uninterrupted Power Supply (UPS):**

As reported earlier a prototype had been made which required improvements and testing. The desired improvements were reported to have been made and this improved prototype would be presented in the conference in February 1994. It was also reported that the prototype would be further improved and tested thoroughly before the end of the project. Multiline expressed interest in acquiring this technology.

### **Related information:**

It was stressed that every effort be made to complete all improvements, where ever required, in the prototype models before the end of March 1994, i.e. before the project time comes to an end.

UET was informed that the proposed national conference would be held in the 2nd week of February 1994 and was likely to be inaugurated by Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister.

UET was reminded that there would be a poster session at the conference to facilitate the participants in publicizing their institutional facilities/expertise/achievements. They were requested to prepare posters for the same.

The counterparts namely Mr. Kamaluddin from DESCON and Mr. Zubair from Multiline were also present in the meeting and both expressed their overall satisfaction over the progress made.

Mr. Zubair of Multiline however felt that the objectives set forth in these projects and the views of the researchers towards these targets was rather ridged as he faced considerable difficulty in convincing the researchers to change specifications during the course of research. He felt that if in future such projects and the researchers exercised more flexibility the end dividends may be enhanced many folds. Dr. Zubair of UET on the other hand felt that Multiline desired to change specifications of the product to be developed too after and did not appreciate that the desired changes in specifications may be more conveniently made once the prototype has been successfully developed.

Mr. Zubair of Multiline nevertheless reiterated his interest in obtaining the technical information related with the improvements made by UET in the UPS. In this respect both the parties were advised to meet with each other and try to settle a deal amongst themselves. However assistance/advise was assured to them only if felt necessary after the advised meeting amongst themselves.

Escorts, unfortunately could not attend the meeting and therefore their views could not be obtained.

**Date:** December 30, 1993  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Center of Excellence in Molecular Biology (CEMB), University of the Punjab, Lahore.

**Participants:**

**USAID**

Ms. Amna Mir                      Project Officer  
Mr. Samiullah Malik              Project Development Specialist

**EDC**

Mr. Assad A. Bukhari              Project Manager  
Dr. Salman A. Malik              Consultant

**MOE**

Mr. Munir Ahmad                  Joint Educational Advisor, Planning & Development

**CEMB**

Dr. Raiz ud Din                      Director & Principal Investigator  
Ms. Esther Khan                      Lecturer & Co-Principal Investigator  
Dr. Amin Ather                      Assistant Professor & Co-Principal Investigator

**Ciba Giegy**

Mr. Amjad                              Manager

**Punjab Drug House**

Dr. Mahmood Alam                  Director

**Objectives:**

- Discussion of conference to be held in 2nd week of February 1994 at Islamabad.
- Evaluation of progress made so far.
- Evaluation of prospects and the extent of completion of the projects before the said conference.

- Provide further guidance in preparation of the posters for the poster session proposed to be organized concurrently with the said conference.
- Seek commitment of enthusiastic participation in the said conference & the poster session.
- Provide Guidance/Assistance in solution of problems still persisting.

### **Summary:**

Progress of the two USAID-IEP projects was discussed. Dr. Raizuddin opened the discussion by general remarks including a brief description of other activities being carried out at CEMB. This was followed by a detailed discussion of the projects including the progress made so far and the problems still persisting.

### **Progress:**

#### **Project 1**

#### **"Microbial Control of Insect Pests in Cotton:**

It was reiterated that there has been significant progress and the initial work has been completed. Some evaluation of activity has been made in collaboration with CIBA GIEGY. The summary of results of these studies were also discussed. In these studies the efficacy of the culture has been tested on naturally infected potato fields in comparison with other bio-insecticide developed by CIBA GIEGY. These results appeared to be very promising.

#### **Project 2**

#### **"Hormone Receptors as Prognostic factors in Health & Disease:**

It was reiterated that some initial work has been completed but further progress is being hampered due to the delay in the supply of commodities. It was understood from discussions that if the commodities could be supplied expeditiously, some more work may still be completed and result presented in the proposed conference in February 1994.

### **Related Information:**

CEMB was informed that the proposed national conference would be held in the 2nd week of February 1994 and was likely to be inaugurated by Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister.

CEMB was reminded that there would be a poster session at the conference to facilitate the participants in publicizing their institutional facilities/expertise/achievements. They were requested to prepare posters for the same.

The counter parts namely Mr. Amjad from CIBA and Dr. Mahmood Alam from PDH were also present in the meeting and both expressed their satisfaction over the progress made so far under the circumstances. They also expressed their desire to continue collaboration in such cooperative applied research activities.

**Date:** January 31, 1994  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** P.C.S.I.R. Laboratories, Ferozpur Road, Lahore.

**Participants:**

**USAID**

Ms. Amna Mir                      Project Officer  
Mr. Samiullah Malik              Project Development Specialist

**EDC**

Mr. Assad A. Bukhari              Project Manager  
Dr. Salman A. Malik              Consultant

**MOE**

Mr. Munir Ahmad                  Joint Educational Advisor, Planning and  
Development

**Gomal University**

Dr. G. A. Miana                      Professor & Principal Investigator.

**PCSIR**

Dr. Ehsan Ali                          Director General  
Dr. Tanveer Ahmed                  Principal Scientific Officer  
Dr. Saleem                              Senior Scientific Officer

**STEDEC**

Mr. Mukhtar Ahmad Ch.              Manager Finance & Admn.

**Objectives:**

- Discussion of conference to be held in 2nd week of February 1994 at Islamabad.

- Evaluation of progress made so far.
- Evaluation of prospects and the extent of completion of the projects before the said conference.
- Provide further guidance in preparation of the posters for the poster session proposed to be organized concurrently with the said conference.
- Seek commitment of enthusiastic participation in the said conference & the poster session.
- Provide Guidance/Assistance in solution of problems still persisting.

**Summary:**

Progress of the two USAID-IEP projects was discussed. Both projects were discussed at length including the progress made so far, the problems still persisting and their possible solutions. The director general opened the discussion by an introduction to various project activities being carried out at PCSIR. This was followed by detailed description/discussion of IEP Projects.

**Progress:**

**Project 1**

**Commercial Exploitation of Taxol Anti-Cancer Drug:**

It was reiterated that leaves of Taxus baccata collected from Nathia Gali had been extracted with various solvents and the extracts tested for the presence of Taxol. No Taxol has been detected in any extract. Since an earlier report suggested the presence of Taxol only during the winters it was reported that collection of more sample material would be done again soon after the snow falls. Further work on the project may be carried out only thereafter and a final view of the project obtained.

**Project 2**

**Commercial Exploitation of Azadirachtin:**

As stated in the previous report, Azadirachtin was extracted using a variety of solvents and tested on sun-flower fields. It was reported to show potency in all cases. Work for its bulk extraction was reported to have been carried out in collaboration with PCSIR labs. Lahore. The extracts have been estimated for azadirachtin content and the initial results indicate comparable but slightly lower values compared to the earlier reports. Mineral oil extraction for economy was also being considered. It was understood that the extraction work would be completed in the near future and evaluation of potency of the extract would be preformed immediately thereafter. Concurrently estimation/evaluation of its half-life under field conditions, the most economical method of extraction, mode of packing and spraying would also be done. Dr. Miana assured that most of the work would be completed before the proposed conference and that he would present the results to the participants of the conference.

**Related Information:**

All participants were informed that the proposed national conference would be held in the 2nd week of February 1994 and was likely to be inaugurated by Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister.

They were reminded that there would be a poster session at the conference to facilitate the participants in publicizing their institutional facilities/expertise/achievements. They were requested to prepare posters for the same.

To expedite/facilitate extraction work Dr. G.A. Miana was requested to deliver about 10 kg of neem seed kernels to PCSIR labs. Lahore expeditiously, which he promised to do.

Dr. Miana was also informed that most of his desired commodities reported to be missing earlier have been found and would be dispatched to him immediately.

**Date:** February 1, 1994  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** HEJ Institute of Chemistry, University of Karachi, Karachi.

**Participants:**

**USAID**

Ms. Amna Mir	Project Officer
Mr. Samiullah Malik	Project Development Specialist
Dr. J.J. Monagle	Consultant

**EDC**

Mr. Assad A. Bukhari	Project Manager
Dr. Salman A Malik	Consultant

**MOE**

Mr. Munir Ahmad	Joint Educational Advisor, Planning & Development
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**HEJ**

Dr. Attaur Rehman	Director & Principal Investigator
Dr. M. Iqbal Chaudhry	Assistant Professor & Co-Principal Investigator
Dr. Zafar Zaidi	Professor & Principal Investigator
Dr. Attiya Abbasi	Assistant Professor & Co-Principal Investigator

**Hamdard Labs.**

Mr. A.Q. Faruqui	Chief Chemist
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**Ehasan Ullah Labs.**

Dr. Zubair	Pathologist
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**Objectives:**

- Discussion of conference to be held in 2nd week of February 1994 at Islamabad.
- Evaluation of progress made so far.

- Evaluation of prospects and the extent of completion of the projects before the said conference.
- Provide further guidance in preparation of the posters for the poster session proposed to be organized concurrently with the said conference.
- Seek commitment of enthusiastic participation in the said conference & the poster session.
- Provide Guidance/Assistance in solution of problems still persisting.

**Summary:**

Progress of the three USAID-IEP projects was discussed. The discussion was opened by Dr. Attaur Rahman who briefly described the activities of HEJ in general and the IEP projects in particular. All the projects were discussed at length including the progress made so far and the problems still persisting. It was a consensus view that significant progress had been made in all the projects and most of the set forth objectives have been achieved.

**Progress:**

**Project 1                      Investigation of Medicinal Plants for Anti-Diabetic Activity:**

It was reiterated that significant progress has been made in this project and four plants have been identified which show hypoglycemic activity. An improved formulation was being prepared from two of these and two other plants. This formulation is expected to be ready and evaluated for activity and toxicity by/before the conference in February 1994. Further work in collaboration with Hamdard labs. on the project was reported to continue even after the termination of IEP. It was a consensus view that continuation of such cooperative applied research activity between HEJ institute of chemistry and Hamdard labs. after the termination of IEP was a very encouraging sign.

**Project 2                      Bating enzymes from Animal Sources:**

It was reported that further progress has been made in the project and the work was continuing. The bating enzyme from bovine pancreas has now been purified and the initial results indicated its activity to be many folds more than the activity of the available bating enzymes in the local market. Work was however being hampered due to lack of commodities. Replacement of expired/damaged chemicals as well as provision of missing chemicals was still awaited.

**Project 3                      Development and pilot plant production of Medical Diagnostic Kits.**

It was reported that further progress has also been made in this project. Two kits, one for Glucose and the other for bilirubin have been successfully developed. The initial results for both kits were reported to be very encouraging. These compared well with the results obtained by using imported kits, although the estimated value for sugar and bilirubin using HEJ kits were reported to be a little lower (about 10%) in comparison. Efforts to develop a kit for urea estimation were continuing with not much success till the meeting.

**Related Information:**

HEJ was informed that the proposed national conference would be held in the 2nd week of February 1994 and was likely to be inaugurated by Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister.

HEJ was reminded that there would be a poster session at the conference to facilitate the participants in publicizing their institutional facilities/expertise/achievements. They would requested to prepare posters for the same.

The counter parts namely Mr. Faruqi from Hamdard and Dr. Zubair from Ehsanullah labs., were also present in the meeting and both expressed their satisfaction over the progress made so far under the circumstances and assured their continued cooperation.

It was understood that if the desired commodities may be supplied expeditiously even more significant achievements may be made in both the projects 2&3 by/before the conference in February 1994. In this respect HEJ was assured all possible assistance.

**Date:** February 2, 1994  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Introduction of IEP in private sector. Institutionalization of IEP concept.  
**Location:** Federation House, Karachi.

**Participants:**

**USAID**

Ms. Amna Mir	Project Officer
Mr. Samiullah Malik	Project Development Specialist
Dr. J.J. Monagle	Consultant

**EDC**

Mr. Assad A. Bukhari	Project Manager
Dr. Salman A. Malik	Consultant

**MOE**

Mr. Munir Ahmad	Joint Educational Advisor, Planning & Development
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**FPCCI**

Mr. M.Rafiq Khan	Secretary General
Mr. Anwar-ul-Haque	Deputy Secretary General
Mr. Abdul Subhan	Deputy Secretary General
Mr. Jamal Sabir	Public Relations Officer

**Objectives:**

- Provide further information on IEP activities.
- Highlight IEP achievement to date.
- Evaluate the interest of FPCCI in IEP.
- Encourage/ensure enthusiastic participation of federation in the national conference proposed to be held in February 1994.
- Seek assistance/advice for institutionalization of IEP concept.
- Obtain further information regarding members of federation.

**Summary:**

A meeting with the Secretary General of Federation of Pakistan Chamber of Commerce and Industry (FPCCI) was held for the above said objectives. The discussion was opened by the Secretary General who informed about the interests and activities of FPCCI. He elaborated on the structure of FPCCI and briefly introduced the various component associations which all make up FPCCI.

Mr. Assad Bukhari thereafter outlined the objectives of the meeting and Ms. Amna Mir elaborated on various aspects of IEP. The response of the Secretary General was very encouraging who reiterated all possible assistance. He assured enthusiastic participation of FPCCI in the proposed conference and informed that since the President FPCCI is abroad the acting President FPCCI would participate. He also accepted the invitation on his behalf and assured that the acting president would address the participants of the conference.

**Related Information:**

FPCCI was reminded that the national conference for the promotion/sustainability of IEP concept would be held in the 2nd week of February 1994 and is likely to be inaugurated by Ms. Shahnaz Wazir Ali, special assistant to the Prime Minister.

FPCCI was also informed that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

FPCCI was appreciative of the briefing provided and expressed hope and desire that this idea is institutionalized. They also expressed their readiness to play their role enthusiastically to provide sustainability.

**Date:** February 3, 1994  
**Project:** USAID Institutional Excellence (IEP).  
**Subject:** Coordination, monitoring and evaluation of the project activities.  
**Location:** Department of Biological Sciences, Quaid-i-Azam University, Islamabad.

**Participants:**

**EDC**

Dr. Salman A. Malik          Consultant

**QAU**

Dr. Abdul Hameed          Assistant Professor & Principal Investigator

Dr. Khalida Sultana          Assistant Professor & Principal Investigator

**BIO-TECHNOLOGY LTD PAKISTAN**

Amir Qazi                      Technical Director

**Objectives:**

- Discussion of conference to be held in 2nd week of February 1994 at Islamabad.
- Evaluation of progress made so far.
- Evaluation of prospects and the extent of completion of the projects before the said conference.
- Provide further guidance in preparation of the posters for the poster session proposed to be organized concurrently with the said conference.
- Seek commitment of enthusiastic participation in the said conference & the poster session.
- Provide Guidance/Assistance in solution of problems still persisting.

**Summary:**

The progress of the two USAID-IEP projects was discussed and relevant information was exchanged with both the P.I.(s) separately. Both P.I.(s) reported further progress on the projects and elaborated on the problems still persisting.

**Progress:****Project 1****Bating Enzymes from Animal sources:**

As stated in the earlier report the project on the whole has been going rather well. All the lab. scale work has been completed. The installation of the fermenter for large scale production has now been completed. However it was reported that it still required certain commodities and would be fully commissioned in the near future. Thereafter subject to supply of necessary commodities & glass ware, which are still awaited, large scale production would be immediately started and the product supplied to the counterparts for evaluation of activity under industrial conditions. Concurrently the technique for maximum efficiency/ production of the enzymes would also be perfected at bulk scale level.

**Project 2****Bioinsecticides in the Control of Insect Pests of Cotton.**

The progress of the project was discussed with Dr. Khalida Sultana who is now looking after the project as the Principal Investigator. Dr. Khalida reported that some progress has been made but due to delay in the supply of commodities, many of which are still awaited, the work has been seriously hampered. She however reiterated that certain microbes possessing insecticidal activity have been isolated and the results obtained so far have been promising and would be presented to the delegates of the conference.

**Related Information:**

The Principal Investigators were reminded that the national conference for the promotion/sustainability of IEP concept would be held in the 2nd week of February 1994 and is likely to be inaugurated by Ms. Shahnaz Wazir Ali, special assistant to the Prime Minister.

The Principal Investigators were also reminded that there would be a poster session at the conference to facilitate the participants in publicizing their as well as their institutions facilities/expertise/achievements.

Dr. A. Hameed was informed that all formalities related with purchase & supply of still due commodities have been completed and the same may be delivered to him in a few days.

**REPORT OF  
NATIONAL CONFERENCE ON PUBLIC PRIVATE  
PARTNERSHIP IN TECHNOLOGY  
DEVELOPMENT: EMERGING LINKAGES  
BETWEEN INDUSTRY AND RESEARCH  
INSTITUTIONS**

**HELD AT**

**MARRIOTT HOTEL  
ISLAMABAD**

**ON**

**February 12, 1994**

**SPONSORED BY**

**United States Agency for International Development  
Islamabad**

**UNDER**

**INSTITUTIONAL EXCELLENCE PROJECT**

**ORGANIZED BY**

**EDC (Pvt) Limited  
Enterprise & Development Consulting**

**Authors: Dr. Salman A. Malik  
Mr. Assad A. Bukhari**

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## ACKNOWLEDGEMENTS

We wish to express gratitude to Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister, Mr. Iftikhar Malik, President FPCCI, Professor Pareshan Khatak, Chairman UGC, and Mr. Munir Ahmed, Joint Educational Advisor (P&D), Ministry of Education for gracing the Inaugural Session and addressing the delegates.

Thanks are due to Dr. M.H. Qazi Member (W.T) UGC, for extending all support and participating in conducting of the conference. We particularly thank Dr. A.Q. Ansari, Chairman PCSIR, Mr. M. Usmani, Secretary Education, and Dr. M. Afzal, former Education Minister, who chaired the various sessions and contributed significantly in the deliberations of the conference.

Thanks are also due to the delegates of the Research Institutions and their respective Industrial counterparts who provided the material which formed the basis of deliberations, discussions and recommendations. We gratefully acknowledge their efforts and to all we express our appreciation.

We also feel obliged to all the participants who took part in the conference deliberations and contributed in a professional manner.

To all others who helped in their own special way and made significant contributions towards the success of the conference, we would like to express our deep gratitude.

## LIST OF ABBREVIATIONS

CEMB	CENTER OF EXCELLENCE IN MOLECULAR BIOLOGY
CO-P.I	CO-PRINCIPAL INVESTIGATOR(s)
FPCCI	FEDERATION OF PAKISTAN CHAMBERS OF COMMERCE & INDUSTRIES
HEJ	HUSEIN EBRAHIM JAMAL RESEARCH INSTITUTE OF CHEMISTRY
IEP	INSTITUTIONAL EXCELLENCE PROJECT
JEA (P&D)	JOINT EDUCATIONAL ADVISOR, PLANNING & DEVELOPMENT
KGC	KHAWAJA GLASS COMPANY
MOE	MINISTRY OF EDUCATION
NCEG	NATIONAL CENTER OF EXCELLENCE IN GEOLOGY
OGDC	OIL & GAS DEVELOPMENT CORPORATION OF PAKISTAN
P.I	PRINCIPAL INVESTIGATOR(s)
PCSIR	PAKISTAN COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH
QAU	QUAID-I-AZAM UNIVERSITY
R.I	RESEARCH INSTITUTION(s)
STEDEC	SCIENTIFIC & TECHNOLOGICAL DEVELOPMENT CORPORATION OF PAKISTAN
UET	UNIVERSITY OF ENGINEERING & TECHNOLOGY
UGC	UNIVERSITY GRANTS COMMISSION
W.T.,UGC	MEMBER WHOLE TIME UGC

## EXECUTIVE SUMMARY

A one day conference was organized to provide an opportunity for a collective dialogue, to present the results of the various research projects to the participants for evaluation of the over all success of IEP and to enhance and institutionalize the concept of cooperative applied research.

The conference commenced at 0900 hrs. and continued till 1730 hrs. with intermittent prayer breaks. The inaugural session was attended by more than 150 delegates who were addressed by Professor Pareshan Khatak, (UGC) Arnold Radi (USAID), Mr. Munir Ahmed (MOE), Mr. Iftikhar Malik (FPCCI) and Ms. Shahnaz Wazir Ali, Special Assistant to the prime Minister. This was followed by a poster session inaugurated by Ms. Shahnaz Wazir Ali, the chief guest of the conference.

The agenda for the working sessions was long and consequently the sessions were intense. In addition to delegates from government of Pakistan, various research institutions/centers/ universities, industry and some donor agencies, all the research institutions involved in IEP participated through P.I.(s) & Co-P.I.(s) alongwith almost all the industrial counterparts who participated through senior or executive level personnel.

The working session commenced by presentation of the results/achievements made by the P.I.(s) or Co-P.I.(s) during the operation of their respective projects. The presentations were well prepared and well delivered. Most of the speakers were able to present their final results while others reported significant progress towards the stated objectives and expressed hope that the projects would be completed in full by/before the end of March 1994 which is the project completion date.

A short session of discussions followed the presentations and continued into the concluding session. The discussions included progress made, problems encountered & their possible solutions, changes in the system which may stimulate/encourage R.I.- industry cooperation and comments/observations/remarks from the industrial counterparts.

The participants supported the concept of R.I.- Industry cooperative and applied research activity. The industrial participants expressed hope and interest to support such applied research activities in various R.I.(s) from their own resources provided some measures to safeguard their interests and investments be made.

During the concluding session the draft of an operational manual to serve as a guide for future such activities was presented to the delegates for their perusal and comments. Recommendations based on the experience of IEP to be presented to the Government of Pakistan on behalf of all the delegates of the conference were also presented, discussed and a consensus arrived at.

The concluding session was summarized separately by Dr. Sarah Tirmazi of USAID, Mr. Munir Ahmed, JEA (P&D) Ministry of Education, and Dr. M. Afzal, former Minister of Education.

The conference ended with the resolve to participate even more enthusiastically in all such future activities.

## **OBJECTIVES OF THE CONFERENCE**

The objective of the conference may be summarized as follows

### **EVALUATION**

- Of the over all degree of success of the projects.
- Of enthusiasm & interest of the industrial participants for continuing such cooperative efforts.
- Of suggestions/recommendations that may be proposed during the conference.

### **CONFIDENCE BUILDING & LEARNING**

- To enhance the confidence between research institutions and industry by providing an opportunity of a collective dialogue.
- To share the lessons learnt during IEP with government of Pakistan, donor agencies and other participants of the conference.
- To learn from each others experience.

### **PREPARATION FOR FUTURE ACTIVITIES**

- To collectively plan and prepare for similar future activities.
- To develop a consensus on recommendations to be made to the Government of Pakistan
- To present the contents of the IEP operational manual to be published before the end of IEP for perusal & comments of the participants.
- To define themes and propose a structure to Government of Pakistan and Donor agencies for institutionalization of the concept.

## SUMMARY OF INAUGURAL SESSION

The session commenced by recitation from the Holy Qurran followed by the welcome address delivered by Professor Pareshan Khatak, Chairman UGC. He welcomed all the delegates and elaborated on the role of UGC in the IEP. This was followed by an address by Mr. Arnold Radi, Chief, Office of Development Resources, USAID, who informed the delegates regarding various development activities both in the education and social sectors in which USAID has contributed significantly including the IEP.

Mr. Munir Ahmad, Joint Educational Advisor (P&D), Ministry of Education, then addressed the delegates and elaborated on the concept and achievements of IEP.

The Acting President FPCCI, Mr. Iftikhar Malik then addressed the delegates and provided the view of the private sector on such cooperative applied research activities. Mr. Malik was very appreciative of the concept and enthusiastically expressed hope that such activity is encouraged. He assured all possible assistance from the private sector and hoped that the Government would reciprocate in the same way. He also outlined the areas which in his opinion deserved most attention and priority.

Ms. Shahnaz Wazir Ali, Special Assistant to the Prime Minister, finally expressed her views which were distinctly favorable. She assured the delegates that the Government of Pakistan would take all necessary measures to enhance this kind of activity. She hoped that the deliberations of the conference would provide a guide for the Government and that she would ensure that the recommendations of this conference are favorably considered by the Government.

Ms. Shahnaz Wazir Ali, thereafter inaugurated the poster session and took keen interest in the exhibits. She was provided a guided tour through the various posters and was briefed by the presenters. The inaugural session thereafter was closed by thanks to all the dignitaries who graced the session.

## SUMMARY OF PRESENTATIONS

All the investigators were provided an opportunity to present their work. The presentations were well prepared and well delivered. The investigators explained the objectives of their respective projects and reported the achievements made. Dr. A.Q. Ansari, Chairman PCSIR, chaired the 1st working session while the 2nd working session was chaired by the Mr. M. Usmani, Secretary Education.

**Presentation 1:**            Sedimentological Studies in Potential Hydrocarbon-bearing Strata:  
made by

Dr. Iftikhar Abbasi  
of NCEG

The objective of this project was to conduct the initial geological studies of the area to help OGDC in their oil exploration efforts.

It was reported that the project had been completed for some time now and the work had been commended by OGDC. A copy of the final report had already been provided to USAID and OGDC. The extracts from the same were described to the participants which included some details of the work done. It was reported that Kohat Basin consists of four formations and was once a part of an epicontinental sea. The high sea regressed but flooded the Basin again before its final regression. These studies show that the basin is composed of olive-green clay, silt stone, sand stone and lime stone with subordinate dolomite and gypsum. These occur in various proportion in different formations and relate to varied deposition due to varied environments that existed during the respective eras.

**Presentation 2:**            Identification & Characterization of Quality of Silica Sand  
made by                            Resources for Glass Making:

Dr. Hameed Ullah  
of NCEG

The objective of this project was to study & recommend alternate sites for procuring quality silica sand for the manufacture of glass.

Summary of results of analyzed samples totalling more than 50 were presented to the participants. It was reported that samples of silica sand deposits in Munda Gucha, Mansehra; Ghalanai, Mohamand Agency, Chashma and other areas, D.I.Khan were analysed for the composition of silica sand and its grain size. The results of these studies show that some of these sites may be used for producing quality sheet glass while others may be used for producing quality ceramics. It was also reported that all the work has been completed and a formal report has been submitted to Khawaja Glass Company (KGC) for their perusal. Hope was expressed that the comments of KGC would be received soon and would be incorporated in the final completion report of the project.

**Presentation 3:**  
made by  
**Dr. Qasim Jan**  
of NCEG

**Inclusion Studies of Sheet Glass:**

The objective of this project was to study the inclusion bodies present in the glass samples and make corrective recommendations.

The results of the completed experimental work were presented to the participants. It was reported that the inclusion bodies present in the provided glass samples have been studied and detailed microscopic and geochemical analyses of the same have been performed. The results indicate that these inclusions are probably a consequence of improper blending/mixing of the various ingredients. It was also reported that the work has been completed and the findings have been submitted to KGC in the form of a report for their perusal. Hope was expressed that the comments of KGC would be received soon and would be incorporated in the final completion report of the project.

**Presentation 4:**  
made by  
**Dr. Tahir Shah**  
of NCEG

**Review of Analytical Processes at Khawaja Glass Company:**

The objective of this project was to develop/propose cost effective but reliable and time saving alternate methods for making routine analysis in the quality control laboratory at Khawaja Glass Company (KGC). In addition, to make recommendations for improving the efficiency of the quality control laboratory at KGC.

It was reported that the work on this project has also been completed. A formal report has been provided to KGC for their perusal. Extracts of the report were presented to the participants. It was reported that improved methods for the determination of various element oxides, which are important in the manufacturing of good quality sheet glass, including  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{CaO}$ ,  $\text{MgO}$  and  $\text{Fe}_2\text{O}_3$ , have been developed. Standards for comparison of results have also been developed and provided to KGC for their use. Hope was expressed that the comments of KGC would be received soon and would be incorporated in the final completion report of the project.

**Presentation 5:**  
made by  
**Dr. A. Hameed**  
of QAU

**Bating Enzymes from Animal Sources:**

The objective of this project was to develop technology for the national leather industry to locally prepare a cost effective, quality bating enzyme from microbial sources.

It was reported that the project on the whole has been going rather well and all the laboratory scale work has been completed. The findings of the completed work were presented to the participants. It was reported that a method for obtaining bating enzyme from microbial sources has been developed. The enzyme obtained by this method has been shown to yields better product compared to other bating enzymes available in the market.

It also appears to be very economical. It was further reported that

installation of the fermenter for large scale production has now been completed and work on large scale production is underway. Hope was expressed that the objectives of the project would be fully accomplished by/before the end of March 1994, i.e. before the project completion date.

**Presentation 6:**  
made by  
**Dr. Zafar Zaidi**  
of **HEJ**

Bating Enzymes from Animal Sources:

The objective of this project was to develop technology for the national leather industry to locally prepare a cost effective, quality bating enzyme from extracts of pancreas.

It was reported that the technology has been developed and a bating enzyme from bovine pancreas has been purified and the initial results indicated its activity to be many fold more than the activity of the available bating enzymes in the local market. Further work on the project was continuing and final results are expected by/before the end of March 1994, i.e. before the project completion date.

**Presentation 7:**  
made by  
**Dr. G. A. Miana**  
of **GOMAL UNIV.**

Commercial Exploitation of Azadirachtin:

The objective of this project was to develop a cost effective and potent pest repellent from neem seeds.

The results of the completed experimental work were presented to the participants. It was reported that Azadirachtin had been extracted using a variety of solvents and its effectiveness as a repellent tested over sunflower fields. It has been found to show potency in all cases. Work for its bulk extraction has been carried out in collaboration with PCSIR laboratories Lahore. The extracts have been estimated for azadirachtin content and the initial results indicate a comparable but slightly lower value compared to the earlier reports. Mineral oil extraction for economy was also being considered. It was understood that the extraction work would be completed in the near future and evaluation of potency of the extract would be performed immediately thereafter.

**Presentation 8:**  
made by  
**Dr. G.A. Miana**  
of **GOMAL**

Commercial Exploitation of Taxol Anti-Cancer Drug:

The objective of this project was to economically extract and study "Taxol" from Taxus baccata. Taxol is reported to contain anticancer activity.

The results of the completed experimental work were presented to the participants. It was reported that leaves of Taxus baccata collected from Nathia Gali had been extracted with various solvents and the extracts tested for the presence of Taxol. No Taxol has been detected in any extract. Since an earlier report suggested the presence of Taxol only

during the winter it was reported that collection of more sample material would be done again soon after the snow falls. Further work on the project may be carried out only thereafter and a final view of the project obtained.

**Presentation 9:**  
made by  
**Dr. Raizuddin**  
of **CEMB**

**Microbial Control of Insect Pests in Cotton:**

The objective of this project was to develop a cost effective but potent bioinsecticide to supplement/substitute the chemical insecticides against cotton ball worm. In addition, a cost effective, quality medium for propagation of the microbe was also to be developed.

It was reported that there has been significant progress and the initial work has been completed. The results of the completed experimental work were presented to the participants. Some evaluation of the insecticidal activity possessed by *Bacillus thuringiensis* has been made in collaboration with CIBA GIEGY. The summary of results of these studies were also discussed. In these studies the efficacy of the culture has been tested on naturally infected potato fields in comparison with other bio-insecticide developed by CIBA GIEGY. These results appeared to be very promising. Further work on the project is continuing and hope was expressed that most of the work would be completed by the end of March 1994.

**Presentation 10:**  
made by  
**Dr. Khalida Sultana**  
of **QAU**

**Bioinsecticides in the Control of Insect Pests of Cotton:**

The objective of this project was to develop a cost effective, broad based/broad spectrum bioinsecticide which may supplement/substitute the chemical insecticides. In addition a cost effective, quality medium for propagation of the microbes was also to be developed.

The results of the completed experimental work were presented to the participants. It was reported that certain microbes possessing insecticidal activity have been isolated and characterized. The results obtained so far have been promising. Further work involving synergistic action of a mixture of these microbes is under way. Hope was expressed that most of the work would be completed and more results may be obtained by the end of March 1994.

**Presentation 11:**  
made by  
**Dr. M. Iqbal**  
of **HEJ**

**Investigation of Medicinal Plants for Anti-diabetic Activity:**

The objective of this project was to determine efficacy of the various anti-diabetic formulations prepared by Hamdard Laboratories Pakistan and to identify the potent ingredient(s) in such formulations. In addition the anti-diabetic potency of some other herbs commonly assumed to have such efficacy was to be verified.

The results of the completed experimental work were presented to the

participants. It was reported that two out of five formulation commonly prescribed have positive potency. On the basis of these results and in accordance with the recommendations of HEJ, Hamdard laboratories have advised their practitioners to prescribe only the two positive potency containing formulations. It was also reported that four plants have been identified which show hypoglycemic activity. An improved formulation has been prepared from two of these and two other plants. This formulation, however will require evaluation of activity and toxicity. Hope was expressed that further work in collaboration with Hamdard laboratories on the project would continue even after the termination of IEP.

**Presentation 12:**  
made by  
**Dr. Zafar Zaidi**  
of **HEJ**

**Development and Pilot Plant Production of Medical Diagnostic Kits.**

The objective of this project was to develop cost effective and reliable assay kits for routine clinical analyses.

The results of the completed experimental work were presented to the participants. It was reported that two kits, one for Glucose and the other for Bilirubin have been successfully developed. The initial results for both kits were reported to be very encouraging. These compared well with the results obtained by using imported kits, although the estimated value for sugar and bilirubin using HEJ kits were reported to be a little lower (about 10%) in comparison. Efforts to develop a kit for urea estimation were continuing.

**Presentation 13:**  
made by  
**Dr. Riazuddin**  
of **CEMB**

**Hormone Receptors as Prognostic Factors in Health & Disease:**

The objective of this project was to develop a cost effective and reliable assay kit for an early evaluation of cancer risk to the subject due to hormonal imbalance.

The results of the completed experimental work were presented to the participants. It was reported that some initial work has been completed which includes development of method to detect alterations in hormone level. It was suggested that altered hormone level may be used as an indicator for evaluating the tendency toward disease. Further work on this project was reported to be in progress. Hope was expressed that most of the work would be completed by the end of March 1994.

**Presentation 14:**  
made by  
**Dr. Zubair**  
of **UET**

**Un-interrupted Power Supply (UPS):**

The objective of this project was to develop a cost effective and reliable UPS system using indigenous technology and materials/ components readily available in the local market.

The results of the completed experimental work were presented to the participants. It was reported that an initial prototype had been made which required improvements and testing. The desired improvements were

reported to have been made and this improved prototype was presented in the poster session of the conference. This prototype was shown to work with sine wave, which produces relatively less background disturbance, instead of the square wave. It was also reported that this prototype would be further improved and tested thoroughly before the end of the project.

**Presentation 15:**  
made by  
**Dr. Zubair**  
of UET

**Design & Development of an Expert Logic Controller:**

The objective of this project was to develop a reliable and cost effective A.C. motor controlling system in accordance with the needs of the national industries, using components readily available in the local market.

The results of the completed experimental work were presented to the participants. It was reported that a prototype model of the logic controller has been developed. This prototype was presented in the poster session of the conference. It was also reported that an industrial/commercial scale model may be now assembled using the same design.

**Presentation 16:**  
made by  
**Dr. Zubair**  
of UET

**Microprocessor based Multimetering, Energy & Tariff Meter:**

The objective of this project was to develop a cost effective & reliable multimetering, energy and tariff meter using components readily available in the local market.

The results of the completed experimental work were presented to the participants. It was reported that a prototype model of the energy and tariff meter has been assembled. This prototype was presented in the poster session of the conference. The prototype was shown to measure voltage, wattage and current separately and accurately at any given moment and could also work out the value of electricity consumed using different tariff rates. It was also reported that a variety of additional features may be added to this prototype through indigenously improvised technology as and when required.

## SUMMARY OF DISCUSSIONS

The participants enthusiastically discussed the results & progress of the projects both in terms of their economic/applied value and the impact on future such activities. There was a consensus that all the projects were of significant economic/applied value and that many of them had achieved, in full, the stated goals. There was also consensus that most others which have not yet been completed, may be completed before/by the end of March 1994 i.e. before the project completion date.

The industrial participants expressed hope and interest in supporting such applied research activities from their own resources, provided they are assured exclusive rights on results, the work is carried out in a timely manner, and that they are kept informed regarding the progress of the research work on a regular basis.

The draft of an operational manual to be published later was also presented to the participants for their perusal and comments. The participants were of the view that such a manual would serve as a useful reference/information material for future activities.

The problems encountered during the course of these projects were also discussed. These included those which may be non-reoccurring as well as those which are likely to reoccur in future again. There was a consensus that the frequency and the completeness of the progress reports in the present case was somewhat unsatisfactory and may be improved in the future. Also personal contacts/communications with the industrial counterparts including the level of contact may be further improved in the future. It was pointed out that the project activities in the present case was not given high enough priority by the administrators. This resulted in lack of timeliness and improper scheduling of the research work.

It was felt that lack of awareness of financial management and operating procedures by some of the research workers also contributed towards difficulty in arranging of the necessary funds and commodities. It was emphasized by some of the participants that most of the above said problems may be overcome if changes in attitudes and regulations are brought about at all levels and un-interrupted services of professional agencies for the management and coordination of such cooperative applied research activities are utilized.

A draft of recommendation to be made to the Government of Pakistan was also presented discussed and consensus reached at. It contained more specific solutions to some of the above said problems in the form of recommendations/suggested changes in the system which are likely to stimulate/encourage such cooperative applied research activities and help in institutionalization of the process. A copy of these recommendations after revision in accordance with the feelings of the participants is attached as Annexure 1.

The lessons learnt during IEP and the deliberation of the conference were summarized by Mr. Munir Ahmed, JEA, and Dr. Sarah Tirmazi, USAID, separately. The conference was formally closed by the concluding remarks and advise from Dr. M. Afzal, former Education Minister.

## **ACHIEVEMENTS**

**It emerged as a consensus view that the objectives set forth for the conference were fully accomplished. These may be enumerated as:**

- **A high level of participation and enthusiasm was achieved.**
- **Progress of each project was evaluated and the overall success of IEP was established.**
- **Credibility of the research institutions for carrying out applied research was established.**
- **All participants expressed enthusiasm to continue cooperative applied research activities.**
- **Planning for future such activities was initiated and a commitment of enthusiastic participation by all the participants was obtained.**
- **Recommendations for continuing such cooperative applied research activities were approved.**

The following recommendations are presented as a result of the experience gained throughout the operation of the USAID/UGC Institutional Excellence Project (IEP), and deliberations which took place in working sessions comprising scientists, technologists, academicians, and representatives of industry and commerce. The deliberations were held at the Hotel Marriott on February 12, 1994. The recommendations are presented for consideration and implementation by the government, research institutions and the industrial/commerce sector.

These recommendations are grouped into three major categories:

- The creation of a Resource Center to institutionalize the public sector/private sector technology development process
- The role of the Government of Pakistan in the promotion of cooperative research activities
- The university/research institution's role and responsibilities

### **Section I. The Resource Center**

The institutionalization of public sector/private sector cooperation to promote technological development is strongly urged. The establishment of a long-term Resource Center is essential, and will require immediate and adequate funding. The Resource Center could be located either in the private sector or the University Grants Commission (UGC). Because the private sector is most closely tied to industrial problems in need of solutions, the first preferred location should be the private sector.

This Resource Center will have a number of functions; it will serve as a nation-wide data bank and clearing house of industrial problems and resumes of scientific and technical personnel in applied research from universities and other research institutions who are available for cooperative research. The data bank should be able to provide comprehensive information on the various Pakistani private sector and research institutions, and later similar international organizations.

In addition to collecting information, it will disseminate promotional brochures containing information of scientific personnel, current cooperative research underway, and information on industrial sector problems that need research solutions.

It will also sponsor periodic seminars for industrial and research personnel at regional Chamber of Commerce Centers and scientific institutions.

Finally, the Resource Center should have liaison personnel who can facilitate contacts between researchers and companies in the formulation of proposals and completion of final cooperative arrangements. It should have the ability to evaluate requested services by the private sector and the products/services offered by the research institutions and select the best available personnel for cooperative research.

It is recommended that the staff of the Resource Center should consist of a manager, at least two data base specialists and three liaison specialists.

It is also recommended that the staff members be sent abroad for short-term training to an institution with broad experience in the field of industry/research institution cooperation.

To assist the Resource Center in facilitating cooperation, it is recommended that a Supervisory Unit should be established, with membership from research institutions, industry and government. The Supervisory Unit should examine existing policies and procedures in each sector which need to be modified to remove impediments, and to stimulate and expand cooperative efforts.

A proposed membership for the Supervisory Unit would be four to six research representatives, four to six industrial representatives, a representative of FPCCI, a representative of the Ministries of Education and of Science and Technology, and a representative from the Economic Affairs Division.

## **Section II. The Government of Pakistan**

In order to foster indigenous scientific research, it is recommended that the following policy and funding commitment changes be made. An interim Steering Committee chaired by the Special Advisor to the Prime Minister might be formed to facilitate the process of policy changes.

### **A. University Policy Changes**

Certain recommendations should be made to improve the climate for researchers actively engaged in research. It is recommended that released time from administrative duties and reduced teaching loads be given to active researchers, i.e., half-time loads.

It is recommended that financial incentives and a share in royalty or license fee income be provided to researchers

It is recommended that merit points for promotion be given to active, successful researchers.

It is recommended that a researcher be designated as a liaison person to ensure that group meetings of researchers are arranged periodically to exchange research information and to ensure that resumes are collected and sent to the Resource Center;

It is recommended that the research staffs be trained in all aspects of the cooperative research process, e.g., proposal writing, budget preparation, project implementation and reporting, etc.

It is also recommended that a financial management unit for research be set up at each research institution which will do project costing, record keeping, and other financial reporting.

All of the above changes must be proposed to the GOP and institutionalized by the University. Initially this should not require additional funding, with the exception of the financial management.

## **B. Funding Requirements**

A private sector/research institution partnership fund amounting to rupees 30 million should be set up to serve as a revolving fund. The fund could be supplemented through foreign assistance as well as endowment by the industry and commerce sectors. The broad areas which will be supported initially will include:

1. Import substitution programs: indigenous production of finished products
2. Quality improvement of Pakistani products to meet global standards in the world's export market
3. Pilot plant production of already established manufacturing processes
4. Additional technology transfer in newly developing areas as space sciences, marine sciences, nuclear sciences and other unconventional energy production.

Only research projects which designate specific industrial partners and develop formal plans and agreements for cooperation should be eligible for support from the revolving fund.

Other funding requirements that will have to be met by the GOP and/or other sectors will be research materials and necessary equipment. These must be paid for, at least initially by the GOP. Possibly the private sector can bear 25% of the equipment and research materials at first.

It is recommended that the GOP fund the financial management unit for applied research to be established at institutions engaged in this research. Also additional funds should be provided for the liaison individual in departments who arranges meetings, collects resumes, prepares promotional brochures, etc.

Besides research materials and equipment, a significant additional expense would be the Resource Center and its staff. This expense may initially be borne by the GOP, but ultimately should be supported by the private sector.

Finally, some funding would be required for the Supervisory Unit.

### **Section III. The Research Sector**

The administration at research institutions should strive to promote a positive cooperative research atmosphere by making the following policy changes:

- set up a financial management unit which will do project costing, record keeping, and other financial reporting;
- develop a policy allocating merit points for promotion to researchers engaged in applied cooperative research;
- allow reduced teaching loads to faculty engaged in cooperative research. These loads should be decreased as the amount of research increases;
- appoint a liaison person within the departments to coordinate the submission of resumes and research background to the Resource Center. This individual can also serve as a liaison person to the Resource Center and department faculty;
- hold frequent discussions with departmental faculty interested in research to pool ideas and organize approaches to industry;
- address the issue of intellectual rights of industrialists and researchers and work out with industries such matters as patents, royalties, profit-sharing, etc., on an individual contract basis;
- formulate, with the assistance of trained staff, well-designed research plans and detailed proposals. Once this is completed, they must keep to project schedules and reporting deadlines. Finally, they need to complete project on time, give oral and written presentations, and do project follow-up with company representatives to ensure that results are well-understood and to assist in practical applications.

#### **MANUAL RECOMMENDATION CHECK LIST**

A summary of recommendations from the manual distributed at the conference is given below.

Specific recommendations are given for consideration by the private sector, the research institutions, and the government. Each of these recommendations has been identified from experience gained during the operation of the Institutional Excellence Project:

#### **PRIVATE SECTOR**

- ✓ Establish and fund Resource Center and Supervisory Unit
  - compile a data base of industry problems

- compile a data base of researcher expertise
- serve a liaison function between industry and researchers

### **RESEARCH INSTITUTIONS**

✓ **Revise/amend policies on:**

- released time -- adjustment of teaching loads and other duties for researchers involved in cooperative research
- financial incentives -- adequate financial compensation should be provided for researchers engaged in the cooperative applied research. Researchers should also receive a share of royalty or license fee income resulting from successful commercialization of research results.
- career incentives -- provide career incentives and credit toward promotion for participation in cooperative research
- promotional assistance -- assist in organizing and publicizing information on research institution capabilities
- industry contacts -- assist researchers in making industrial contacts and the process of formulating formal agreements
- departmental liaison -- designate liaison person as contact for Resource Center
- submit individual resumes -- prepare resumes emphasizing expertise for industry and submit to the Resource Center
- pool information within research unit to identify major areas for industrial cooperative research
- seek cooperative arrangements through the Resource Center and companies related to fields of expertise

### **GOVERNMENT**

- ✓ **Provide financial support for applied research projects and cooperate in the operation of the Resource Center**
- ✓ **Provide necessary policy changes at government level for industry and research institutions to stimulate and encourage cooperation**

## **PROGRAM OF THE CONFERENCE**

**Annexure 2**

### **Inaugural Session**

08:00 Registration  
09:00 Guests are seated  
09:15 Bismillah  
09:20 Chairman, UGC  
09:30 Chief, Development Resources, USAID  
09:40 Joint Educational Advisor  
09:50 Acting President Federation of Pakistan Chamber of Commerce  
10:00 Ms. Shahnaz Wazir Ali, Advisor to the Prime Minister

### **10:15 Poster Session**

11:00 Working Session  
01:15 Break for prayer  
02:15 Working Session (Continued)

### **04:30 Concluding Session**

Discussions and recommendation  
05:30 Conclusions & Future Perspective

## AGENDA FOR WORKING SESSION

Annexure 3

**FEBRUARY 12, 1994**

**PROJECT PRESENTATIONS** (maximum 15 min. each: presentation of results  
10 min & discussion 5 min)

**11:00 to 01:15**

**1st Working Session**

11:00 to 10:15

Sedimentology of

NCEG

10:15 to 11:30

Kohat Basin

NCEG

11:30 to 11:45

Silica Sources

Inclusions/Problems  
in Glass Manufacturing

NCEG

11:45 to 12:00

Improvements in

Analytical Processes/

Glass Manufacturing

NCEG

12:00 to 12:15

Bating Enzymes

QAU

12:15 to 12:30

Bating Enzymes

HEJ

12:30 to 12:45

Natural Insecticides

GOMAL

12:45 to 01:00

Anticancer Compound

GOMAL

01:00 to 01:15

Discussion of Projects

01:15 to 02:15

Prayer Break

**02:15 to 04:30**

**2nd Working Session**

02:15 to 02:30

Bioinsecticides

CEMB

02:30 to 02:45

Bioinsecticides

QAU

02:45 to 03:00

Antidiabetic Compounds

HEJ

03:00 to 03:15

Diagnostic Kits

HEJ

03:15 to 03:30

Diagnostic Kits

CEMB

03:30 to 03:45

Uninterrupted Power

Supply Unit (UPS)

UET

03:45 to 04:00

A.C. Motor Controller

UET

04:00 to 04:15

Multimetering, Energy

& Tariff Meter

UET

04:15 to 04:30

Discussion of Projects

04:30 to 05:30

Concluding Session

05:30 to 05:45

Conclusions and Future Perspectives

**LIST OF PARTICIPANTS  
OF THE WORKING SESSION**

Annexure 4

S.NO	NAME	Organization
1	Dr. A. Hameed	Biology Dept., QAU, Islamabad
2	Dr. Khalida Sultana	Biology Dept., QAU, Islamabad
3	Dr. Afsari Qureshi	Biology Dept., QAU, Islamabad
4	Dr. Mehbob Ellahi	Chemistry Dept. QAU, Islamabad
5	Dr. Zahoor Ahmed	Chemistry Dept. QAU, Islamabad
6	Dr. Christy Munir	Chemistry Dept. QAU, Islamabad
7	Dr. Subhan	Chemistry Dept. QAU, Islamabad
8	Dr. Esther Khan	CEMB, University of Punjab, Lahore
9	Dr. S. Riazuddin	CEMB, University of Punjab, Lahore
10	Prof. Atta-ur-Rahman	HEJ Institute of Chemistry, University of Karachi
11	Dr. Zafar H. Zaidi	HEJ Institute of Chemistry, University of Karachi
12	Dr. Attia Abbasi	HEJ Institute of Chemistry, University of Karachi
13	Dr. M. Iqbal Choudhary	HEJ Institute of Chemistry, University of Karachi
14	Dr. M. Qasim Jan	NCEG University of Peshawar, Peshawar
15	Dr. Tahir Shah	NCEG University of Peshawar, Peshawar
16	Dr. Iftikhar Ahmed	NCEG University of Peshawar, Peshawar
17	Dr. Syed Hamidullah	NCEG University of Peshawar, Peshawar
18	Dr. Obaidur Rehman	NCEG University of Peshawar, Peshawar
19	Mr. Mohammad Riaz	NCEG University of Peshawar, Peshawar
20	Dr. G.A. Miana	Dept. of Chemistry, Gomal University, D.I.Khan
21	Dr. Zubair A. Khan	UET, Department of Elect. Engg., Lahore.
22	Ms. Anna Wanchoo	University College of Islamabad.
23	Mr. Idress Anwar	National Institute of Electronics
24	Dr. M. Munir Hasan	NED Engineering University, Karachi
25	Dr. M. Suleman	Center of Excellence in Solid State Physics
26	Mr. S.H. Iqbal	University of Punjab, Lahore

27	Mr. Khalid Munawar	Engineering University, Lahore
28	Dr. A.Q. Ansari	Chairman, PCSIR
29	Dr. Tanweer Ahmed	PCSIR Labs., Lahore
30	Mr. Khalid Mahmood	State Engineering Corporation, Islamabad
31	Mr. Mohammad Nawaz	State Engineering Corporation, HMC, Taxila
32	Professor Imran Ali	LUMS, Lahore
33	Dr. Kauser Malik	NIBGE, Faisalabad
34	Dr. I.H. Qureshi	PAEC, Islamabad
35	Dr. Amin M. Hussain	PAEC Islamabad
36	Dr. N.M. Butt	PINSTECH
37	Ms. Surraiya J. Nasir	National Institute of Psychology. QAU, Islamabad
38	Ms. Tashneem Razzali	Dept. of Microbiology, University of Karachi
39	Dr. Muzammil Ahmed	Center of Excellence in Microbiology, Karachi
40	Dr. Amin M. Hussain	Pakistan Institute of Electronics
41	Dr. Lutfullah	National Center of Excl. Physical Chemistry
42	Dr. Anwar Nasim	Pakistan Academy of Sciences
43	Mr. Aziz A. Khan	STEDEC
44	Dr. M. Afzal	Former Minister of Education
45	Mr. Tajammal Hussain	Planning and Development Div. Govt. of Pakistan
46	Mr. Munir Ahmed	Ministry of Education, Govt. of Pakistan
47	Mr. M. Usmani	Ministry of Education, Govt. of Pakistan
48	Dr. Shahnaz A. Riaz	Ministry of Education, Govt. of Pakistan
49	Iftikhar Malik	Acting President, FPCCI, Islamabad
50	Aftab Akhtar	FPCCI, Islamabad
51	Ch. Muhammad Aslam	Former President, Gujranwala Chamber of Commerce
52	Kh. Zarar Kaleem	Gujranwala Chamber of Commerce
53	Ch. Hamid Razvi	Gujranwala Chamber of Commerce
54	Dr. Abdul Jabbar	SDPI, Islamabad

55	Dr. John J. Monagle	USAID
56	Ms. Amna Mir	USAID
57	Mr. Arnold Radi	USAID
58	Dr. Lois E. Bradshaw	USAID
59	Dr. Sarah Tirmazi	USAID
60	Mr. Dennis Weller	USAID
61	Mr. Akhtar Sabir	USAID
62	Dr. Rushna Ravji	USAID
63	Mr. Liaqat A. Butt	USAID
64	Mr. M. Muhammad	USAID
65	Dr. M. Khalid	USAID
66	Mr. Nadir Abbas	USAID
67	Mr. Samiullah Malik	USAID
68	Mrs. Abida Hassan	UGC, Islamabad
69	Mr. Talat Khurshid	UGC
70	Mr. Sajid Bari	Khawaja Glass Company, Hassanabdal
71	Mr. A.Q. Faruqi	Hamdard Labs. (Waqf) Pakistan.
72	Mr. Ch.Mohammad Aslam	Muhammadi Group
73	Mr. Aamer H. Qazi	Biotechnology Pakistan Pvt. Ltd.
74	Mr. Mushtaq A. Bukhari	ECG
75	Mr. Assad A. Bukhari	EDC
76	Dr. Salman A. Malik	EDC
77	Mr. M. Zubair	EDC
78	Mr. Iqbal Muneer	Private
79	Mr. Saadullah Khan	Private
80	Mr. Ghulam Saeed	Private

**CONFERENCE ON PUBLIC-PRIVATE PARTNERSHIP IN  
TECHNOLOGY DEVELOPMENT: EMERGING LINKAGES BETWEEN  
INDUSTRY AND RESEARCH INSTITUTIONS:**

February 12, 1994

**ADDRESS BY PROFESSOR PARESHAN KHATAK, CHAIRMAN, UGC**

Ladies & Gentlemen,

It is a great pleasure for me to welcome you to the inaugural session of this important Conference on Public-Private Partnership in Technology Development: Emerging linkages between Industry and Research institutions. Pakistan is passing through a phase of rapid economic development. It is becoming increasingly obvious that much of our future progress in technology development will be based on knowledge generated by the Universities. In fact, universities are the largest store house of knowledge. The use of this knowledge has to be related to the economic development of the country. For this reason, the new initiatives taken by the Government for public-private partnership have to be pursued with enthusiasm. Universities can no doubt play a dominant role in this regard. The first demonstration of this role is clearly indicated in the present conference which is the first of its kind being held in Pakistan.

The developments which led to the association of university researchers with private sector enterprises has come through the collaborative efforts of USAID, the UGC and the Ministry of Education. The USAID has played a persuasive role in developing this project. The unique feature of the project has been the identification of the industries which needed help in solving some of their problems and in developing new technologies for adoption in Pakistan. I am glad that the manpower resources for this were available in the universities. A careful selection of industrial problems has led to a modicum of success, demonstrating the effectiveness of university industry partnership. The success that we have achieved with this project, spread over several disciplines, gives us encouragement that this model can be adequately sustained. I am sure that the Government will come forward in encouraging further the appropriate groups in the universities to undertake such ventures in collaboration with industry in Pakistan.

I understand that the USAID Advisor, John Monagle in consultation with the UGC is bringing out a manual which will provide guidelines for future development of this concept. The UGC is grateful to the Ministry of Education and to the Planning Wing of the Ministry of Education for enthusiastically encouraging the use of USAID-IEP funds for this purpose. I am certain that the future development of research in this country generated by the universities will go a long way in providing impetus to economic development in the country. I once again welcome you to the Conference and hope that the recommendations made at the Conference jointly by researchers and industrialists will help us formulate a new policy for public-private partnership in the country. I wish you success.

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February 12, 1994

**ADDRESS BY MR. ARNOLD RADI, CHIEF,  
OFFICE OF DEVELOPMENT RESOURCES, USAID**

Ladies & Gentlemen,

It is a pleasure to participate in this conference on the developing Public Sector-Private Sector Partnership in Technology Development.

The efforts being reported and discussed in the conference are a result of the "Institutional Excellence Project" a joint effort between the Ministry of Education represented by the University Grants Commission and USAID.

This project is an important element in an overall USAID program designed to assist developments in both social sectors and private enterprise. Recognizing extensive needs in education and training USAID has cooperated in a variety of areas and has provided major support in the following areas;

- Primary Education - in the construction of school buildings; training of teachers; establishment of the National Educational Management Information System; curriculum and instructional materials development; and long and short term training for education personnel
- Establishment of the National Agricultural University/Peshawar, with supply of equipment, supplies and training of faculty and technical staff
- Organization and arrangement of overseas training for a broad range of faculty, staff and administrative and technical personnel. In all, approximately eight thousand individuals have benefitted from the training programs, with support provided by various ministries and numerous USAID projects. In the private sector many persons in the Private Sector Agri-Business were trained through the Agriculture Sector Support Program

In other programs involving the public and private sectors, there have been major breakthroughs in establishing firm linkages between Agriculture Research Units, universities and private businesses.

The Institutional Excellence Project (IEP) is an important additional element in this large

program. It is an additional effort to demonstrate, encourage and enlarge effective cooperative arrangements between private sector companies with universities and other research units to solve industrial problems, produce indigenous products and increase economic benefits.

The IEP supported sixteen projects in cooperation with fourteen companies to work on company-designated problems, which, if solved would provide immediate economic and social benefits. The projects covered medicinal areas bioinsecticides, electronic products, leather processing and geology.

It provides a much needed bridge between higher education and industry in Pakistan which can grow into a program of great financial benefit to both participants.

The efforts in the project are also in line with the goal of providing self-generated support for universities. (It should be pointed out that in the U.S. universities generated 55-60% of their budgets from external sources).

The purpose of the conference is to present results of the projects and explore mechanisms to extend and sustain industry cooperation with universities and other applied research units. We look forward to your participation, comments and recommendations as the conference proceeds.

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February 12, 1994

**ADDRESS BY MR. MUNIR AHMED, JEA (P&D) MOE**

Mr. Munir Ahmad spoke extempore. Therefore only the extracts of his address are reproduced below.

He thanked the sponsors and the guests for organising the conference and felt privileged to be able to address the distinguished delegates.

He gave a brief account of the historical perspective of the project and informed that despite the serious set back to this project due to pressler amendment, it continued to the extent that was possible. He felt pleased to say that even with a relatively small amount of money 16 projects in association with 14 industries were commenced at 6 university departments/centers. He said that the results of this initiative have been very encouraging and the lessons learnt through the experience of IEP would serve as a guide to all such future cooperative applied research activities. In his opinion this was a practical demonstration that our universities/centers and the research workers have the intellectual ability and necessary expertise and determination to undertake cooperative applied research work and accomplish the objectives.

He reminded the delegates that for development of Pakistan industry & economy, it was imperative to focus on such cooperative applied research activities. He expressed hope that the concept of IEP would be enhanced and both, the research institutions and the industry would continue to participate even more enthusiastically in similar projects in the future. He also assured continued assistance and cooperation from his office in this regard.

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ADDRESS BY MR. IFTIKHAR MALIK, ACTING PRESIDENT, FPCCI

Ladies & Gentlemen,

I extend my sincere thanks to the USAID for holding this conference where report on the 16 projects launched by USAID in Pakistan to strengthen the research capabilities of selected university departments will be presented. The sponsors are hopeful that although the USAID support will terminate in late March, 1994 yet they expect the continuity of university industry linkage. In my view it is the most important linkage that we require to enter into the 21st Century with indigenously developed technologies.

Although neither Federation of Pakistan Chambers of Commerce & Industry is a Scientific Organization nor I am a Scientist yet I accepted to read a Keynote Address before this august gathering, In view of my vast experience in Industry and my belief that pursuit of knowledge and research in Science & Technology is indispensable for social & economic development. Scientific illiteracy means poverty and exploitation. Our spendings on research & development are lower even in Asia. The need for strengthening linkage and collaboration between research institutions & industries was always felt. We should feel grateful to USAID for taking the initiative. In my address I try to pin-point the priorities & directions which should be the base for improving linkage between the research institutions & industry. Industry Will not be interested in theories how valuable these may be from the academic point of view. The industry in private sector will take interest only in those technologies which have commercial potentials or are market oriented.

**Agriculture Sector**

Agriculture Sector's contribution to GDP and employment are at the top of list. First of all, attention should be focussed on this sector. Farm mechanization, increase in yield per acre, control on plant diseases are the vital sectors where efforts on local level could bear fruits.

**Agri. Business & Agro-Based Industries**

These have vital link with the Agriculture. A number of value added items of commercial importance could be produced e.g.:-

- a. We have a number of flowers which have export potentials, techniques should be developed to grow, pack & export flowers according to International Standard.

- b. We have a variety of citrus fruits. Their juice and concentrates could be developed for domestic use and exports.
- c. Technology is also required to preserve pulp. Presently we import it.
- d. Live stock sector needs technical support.
- e. Farm mechanization is another prospective sector: we have made progress in it. But still a lot is required. Industry & Agricultural Universities could collaborate to improve techniques & technologies to achieve the above narrated objectives.

### **Mineral Development**

We have natural wealth but due to resource constraints could not explore it properly. It is a vast field where industry and scientist could collaborate and bring prosperity to the nation. Scientists should come out with their suggestions how these minerals could be made useful for consumption of local industry.

### **Energy Sector**

Energy Sector needs solution at war-footing. Maximum attention should be diverted to this problem. Development of new sources of energy, energy conservation, devices to save energy, development of machinery & tools based on energy savings are another field which requires intensive research.

### **Engineering Industry**

Engineering Industry is the most important industry which could play key role in the economic development. So far this sector has not been given much importance although potentials are there. Small vendors, small industries & scattered factories could make a strong base for future development if they get proper advice to improve technologies. These technologies must ensure:-

- a. Improvement in quality & design of existing products.
- b. Results in cost savings such as energy, labour & materials.
- c. Help in developing a new product having market potential.
- d. Simplify a sophisticated & expensive production methods or a new manufacturing method is evolved.
- e. Production of capital goods indigenously.
- f. Total or partial control over industrial pollution.

Our Scientists and Professors should come forward and offer the benefits of their research to industries. The industries interested in the offer would contact them and make use of their expertise. The scholars, Scientists & Scientific Research Institutions who cannot contact the industries direct, could use the channels of FPCCI or Regional Chamber of Commerce & Industry of identification & subsequent collaboration with Industries which require technical help. I am certain the research laboratories could help us develop technologies indigenously which we are internationally denied. Their efforts could result in production of items of import substitution, export oriented and strategic importance.

In applied research for industrial development, we are unfortunately greatly dependent on foreign technology. According to a World Bank survey, Pakistan's annual payment for royalty, trade marks and consultants services is US \$ 350 million. This is a colossal waste of our precious foreign exchange reserves. Our research scholars and research institutions must collaborate with industry and do their best to reverse this trend. Our principal sectors of development including agriculture, transport and communications are heavily dependent on science and technology for improved production, better knowledge, more automations and quality control to reduce cost and become more competitive in the world market. This necessitate close and effective collaboration between our scientific research institutions and private industry. FPCCI will be glad to assist in this effort.

### **R&D Activities and Support**

The industries who spend on R&D activities must be given recognition by the Government of Pakistan. Industries and scholars who come out with new technology, device or technique must be rewarded. Because these are the real factors which help attain self-reliance.

To improve the standard of science education and research, Government should increase its spending on scientific education & R&D activities. Presently budget allocation is highly unsatisfactory. It will make us strong and powerful to defend our territory if we achieve economic uplift. The private sector in Pakistan is always willing to support scientific research provided it is relevant and focussed on industries problems. In fact FPCCI has recently taken a decision in principle that all imports to Pakistan should be subjected to a cess of 0.005 percent, which is estimated to yield about Rs. 1.50 crore to support R&D activities. We hope to make this proposal to the Government of Pakistan in the near future for agreement. Our business community at large is expected to support it.

These are the points which I hope will be included in the recommendations of the Conference because these will help develop practical linkages between the research institutions and industries which could produce the desired results.

At the end I am highly Thankful to the University Grants Commission for giving me this opportunity to address you.

Thank you.

**CONFERENCE ON PUBLIC-PRIVATE PARTNERSHIP IN  
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February 12, 1994

**ADDRESS BY MS. SHAHNAZ WAZIR ALI,  
SPECIAL ASSISTANT TO THE PRIME MINISTER**

Ladies and Gentlemen,

I am indebted for this opportunity to address to you, on this auspicious occasion of considering ways and means to re-affirm Education's link with National Development productivity sector and frame-work of country development. We have gathered here today to carry out thread bare discussion on a concept which constitute a corner-stone to the socio-economic policies of Pakistan Peoples Party governments in the past and the present. The sustainable establishment of this concept has the potential to fulfil the long cherished dream of economic self-reliance of our government. The concept I am referring to is the **"Public Private Sector Partnership in technology development: Emerging linkages between the Industries and Research Institutions"**.

The goal of self-reliance has gained greater importance for the socio economic development of Pakistan because of the present global economic trends, which indicate that for the foreseeable future, economics of developing countries like Pakistan will have to contend with the following conditions:

- Greater integration of their national economies into a closer knit global economy dominated by the developed world and their multi-nationals;
- Increased competition between the world economies for limited resources and markets;
- Need for mechanisms resulting in continued improvement in competitiveness of the national economy at the global level;
- Need for the national economies to produce innovative products and services which are attractive in quality and price for both the domestic as well as the foreign consumers in comparison to the global competitors. This has taken on an increased significance in the light of trade agreements such as GATT, NAFTA etc. which are leading to reduction of trade barriers thus increasing competition for the so far closed and nascent economies of the developing world;
- One top of all this, the developing countries will have to contend with lesser capital resources from the developed economies for development of the research institutions. This will be specially true for the pure research type activities;

Therefor, I would emphasize that the basic parameters for achievement of the goal of long term sustainable self-reliance of our national economy would seem to be:

- Efficient and profitable industrial base;
- Increased conversion of raw materials into value added goods marketable locally as well as abroad;
- Special focus on accelerated development and expansion important substitution "Industries";
- Development of indigenous processes/techniques for optimal and economical development.
- Innovative solutions to the industrial problems;
- Global competitiveness of the products;
- Need for new sources of funds for the research institutions;

It is my firm belief that the goal of self-reliance can be achieved through successful implementation of a two pronged strategy comprising of increased exports and maximized import substitution in the national economy. Import substitutions offers definite advantages towards economic self-reliance therefore in this direction may be given as much priority as the export generation if not more.

The achievement of both these can only materialize if the private sector carries out continuous research and development activities to produce innovative and cost effective solutions to their problems. The research and development activities should also provide innovative products & services to the local as well foreign customers. The research and development activities have to result in greater value addition of local raw materials and also economic replacements to the import items. As known to all, our total import bill for July 1992 to April 1993 was \$7.89 billion. I feel that there is a vast scope for reducing the import bill through import substitution. Some examples of potential areas for import substitution/increased export generation are;

#### **Agriculture Sector**

- Raw Cotton Export figures \$252.33 million may be substituted by maximum value added items.
- Edible oil import, \$455 million 1992-1993 Economic Survey.

#### **Engineering Sector**

- Local Magnesite conversion into refractory bricks for steel furnaces can substitute imports worth Rs. 200 million per annum.

- Local chromite processing in Pakistan would result in import substitutions of a large number of items such as ferro chrome, chromium sulphate for tannery industry etc.
- Pakistan steel mill is based on imported inputs such as iron ore (Rs. 1.04 billion), coal (Rs. 1.5 billion) Ferro Manganese (Rs. 88 million), ferro Silicon (Rs. 76 million) figures 1990 EAC Ministry of Prod. etc.

As we can see there are big chunks of the import bill which can be slashed through import substitution.

The private sector itself can contribute to achieving the two pronged strategy for self-reliance by several means. One suggestion which comes to mind is to reduce the high cost paid for the import of high tech machinery and other inputs. As an example we can look at the textile industry. According to my knowledge maximum percentage of the textile production cycle including the spinning, weaving, dyeing, and conversion to garments is based on imported technologies. The use of imported technologies result in higher costs of establishment, maintenance, and financing the project. Thus the products produced from such imported technology based industries, when competing with the indigenous industrial base of countries like India, China etc. loose out. These industries, despite having comparatively lower labor cost and advantage of using local raw materials become inviable.

Therefore we can say that the foundation for any successful self-reliance effort should be a well developed indigenous research and development institutional base for the local industries.

But on the other hand the cost of establishing a viable research and development base is also very high. Presently, in most cases it may not be a viable proposition for the private sector industries to establish independent inhouse research and development capability.

It is in the wake of such considerations that the need to develop fast interaction between industry and technical and scientific research institutes and universities has become pre-eminent. I feel that this is where the importance of the basic concept of the Institutional Excellence Project lies. With a modest input from us 16 projects were launched in six universities/institutions. Apparently the success rate is around 85%. It has provided us with a tried and proven formula for establishing a sustainable public private partnership for technology development through a mutually beneficial partnership between the private sector and research sector. The partnership should include the important players in this process such as FPCCI, Ministry of Education, University Grants Commission, Ministry of Science and Technology, Ministry of Industry and Ministry of Projection. The partnership should be coordinated by a suitable private sector advisory company to overcome any hurdles in the way of effective operation of the partnership. Ultimately the whole process should be handed over to the private sector at an appropriate time.

The project activities have demonstrated the availability of untapped pool of talent in the research sector which may be very suitable for collaborating with the private sector. Work under the IEP has also shown that this talent can successfully serve, if organized properly, broad areas of industrial problem solving and providing import substitution services to the private sector.

**It has also reasonably demonstrated that if approached properly, the private sector is more than willing to contribute in cash or in kind to such a collaborative effort, if it is shown the profit potential in such efforts.**

**In the end I would solicit the honorable participants of this conference to provide future directions for the research institution-private sector partnership based on lessons learnt from the IEP experience. Some of the questions which I feel should be answered by this forum by the end of the day are:**

- **Ways to establish a sustainable partnership base between the research institutions and the private sector, for the mutual benefit for all parties concerned;**
- **How to expand the domestic participation level of the partnership in the private sector as well as the research sector inside Pakistan. The present participants of the IEP could provide a nucleus for this purpose;**
- **How the domestic research-private sector partnership when established and working at an optimum level can link up with similar international organizations working in other countries.**

**In the end I would like to thank the USAID, Ministry of Education, and the UGC for taking this very important initiative and hope that maximum benefit is taken from this opportunity to establish the sustainability of this concept in Pakistan.**

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February 12, 1994

**CONCLUDING REMARKS BY DR. SARAH TIRMAZI, USAID**

Ladies and Gentlemen,

Dr. Afzal, Mr. Munir, Dr. Monagle, distinguished researchers and participants.

It is an honor for me to speak at this gathering, at the conclusion of the "Sustainable public-private partnership for indigenous technological development".

I wish to extend congratulations to all the individuals and organizations that have been involved in making this a successful venture. The UGC has been a major catalyst in the success of this venture, as has industry. I especially wish to congratulate the researchers on their commitment to their work, and on the successes that they have encountered.

A great deal of dedication has gone into making the individual projects a success. The Institutional Excellence Project's goal was to foster linkages between industry and research institutions and centers of excellence. However, as we all know, it is the personnel, the committed individuals, who make up the strength of any institution or center of excellence. The researchers are highly motivated individuals who have worked long hours in order to present their results here today. As was stated earlier today by the honourable special advisor to the Prime Minister, the success rate of 85 percent that has been met is most impressive. This success rate is a reflection of the high quality of work that has been put in by the individual researchers.

It is hoped that the conference today is just one land mark in the further successful development of the industry-research partnership. We at USAID feel proud to have been a part of the beginnings of a productive relationship between industry and research.

In closing, I once again commend the enthusiastic efforts of the researchers. Ladies and gentlemen, please join me in giving them a big hand of applause.

**RECOMMENDATIONS**

**OF**

**NATIONAL CONFERENCE ON PUBLIC  
PRIVATE PARTNERSHIP IN  
TECHNOLOGY DEVELOPMENT:  
EMERGING LINKAGES BETWEEN  
INDUSTRY AND RESEARCH  
INSTITUTIONS**

## IEP CONFERENCE RECOMMENDATIONS

The following recommendations are presented as a result of the experience gained throughout the operation of the USAID/UGC Institutional Excellence Project (IEP), and deliberations which took place in working sessions comprising scientists, technologists, academicians, and representatives of industry and commerce. The deliberations were held at the Hotel Marriott on February 12, 1994. The recommendations are presented for consideration and implementation by the government, research institutions and the industrial/commerce sector.

These recommendations are grouped into three major categories:

- The creation of a Resource Center to institutionalize the public sector/private sector technology development process
- The role of the Government of Pakistan in the promotion of cooperative research activities
- The university/research institution's role and responsibilities

### Section I. The Resource Center

The institutionalization of public sector/private sector cooperation to promote technological development is strongly urged. The establishment of a long-term Resource Center is essential, and will require immediate and adequate funding. The Resource Center could be located either in the private sector or the University Grants Commission (UGC). Because the private sector is most closely tied to industrial problems in need of solutions, the first preferred location should be the private sector.

This Resource Center will have a number of functions; it will serve as a nation-wide data bank and clearing house of industrial problems and resumes of scientific and technical personnel in applied research from universities and other research institutions who are available for cooperative research. The data bank should be able to provide comprehensive information on the various Pakistani private sector and research institutions, and later similar international organizations.

In addition to collecting information, it will disseminate promotional brochures containing information of scientific personnel, current cooperative research underway, and information on industrial sector problems that need research solutions.

It will also sponsor periodic seminars for industrial and research personnel at regional Chamber of Commerce Centers and scientific institutions.

Finally, the Resource Center should have liaison personnel who can facilitate contacts between researchers and companies in the formulation of proposals and completion of final cooperative arrangements. It should have the ability to evaluate requested services by the private sector and the products/services offered by the research institutions and select the best available personnel for cooperative research.

It is recommended that the staff of the Resource Center should consist of a manager, at least two data base specialists and three liaison specialists.

It is also recommended that the staff members be sent abroad for short-term training to an institution with broad experience in the field of industry/research institution cooperation.

To assist the Resource Center in facilitating cooperation, it is recommended that a Supervisory Unit should be established, with membership from research institutions, industry and government. The Supervisory Unit should examine existing policies and procedures in each sector which need to be modified to remove impediments, and to stimulate and expand cooperative efforts.

A proposed membership for the Supervisory Unit would be four to six research representatives, four to six industrial representatives, a representative of FPCCI, a representative of the Ministries of Education and of Science and Technology, and a representative from the Economic Affairs Division.

## **Section II. The Government of Pakistan**

In order to foster indigenous scientific research, it is recommended that the following policy and funding commitment changes be made. An interim Steering Committee chaired by the Special Advisor to the Prime Minister might be formed to facilitate the process of policy changes.

### **A. University Policy Changes**

Certain recommendations should be made to improve the climate for researchers actively engaged in research. It is recommended that released time from administrative duties and reduced teaching loads be given to active researchers, i.e., half-time loads.

It is recommended that financial incentives and a share in royalty or license fee income be provided to researchers

It is recommended that merit points for promotion be given to active, successful researchers.

It is recommended that a researcher be designated as a liaison person to ensure that group meetings of researchers are arranged periodically to exchange research information and to ensure that resumes are collected and sent to the Resource Center;

It is recommended that the research staffs be trained in all aspects of the cooperative research process, e.g., proposal writing, budget preparation, project implementation and reporting, etc.

It is also recommended that a financial management unit for research be set up at each research institution which will do project costing, record keeping, and other financial reporting.

All of the above changes must be proposed to the GOP and institutionalized by the University. Initially this should not require additional funding, with the exception of the financial management.

### **B. Funding Requirements**

A private sector/research institution partnership fund amounting to rupees 30 million should be set up to serve as a revolving fund. The fund could be supplemented through foreign assistance as well as endowment by the industry and commerce sectors. The broad areas which will be supported initially will include:

1. Import substitution programs: indigenous production of finished products
2. Quality improvement of Pakistani products to meet global standards in the world's export market
3. Pilot plant production of already established manufacturing processes
4. Additional technology transfer in newly developing areas as space sciences, marine sciences, nuclear sciences and other unconventional energy production.

Only research projects which designate specific industrial partners and develop formal plans and agreements for cooperation should be eligible for support from the revolving fund.

Other funding requirements that will have to be met by the GOP and/or other sectors will be research materials and necessary equipment. These must be paid for, at least initially by the GOP. Possibly the private sector can bear 25% of the equipment and research materials at first.

It is recommended that the GOP fund the financial management unit for applied research to be established at institutions engaged in this research. Also additional funds should be provided for the liaison individual in departments who arranges meetings, collects resumes, prepares promotional brochures, etc.

Besides research materials and equipment, a significant additional expense would be the Resource Center and its staff. This expense may initially be borne by the GOP, but ultimately should be supported by the private sector.

Finally, some funding would be required for the Supervisory Unit.

### **Section III. The Research Sector**

The administration at research institutions should strive to promote a positive cooperative research atmosphere by making the following policy changes:

- set up a financial management unit which will do project costing, record keeping, and other financial reporting;
- develop a policy allocating merit points for promotion to researchers engaged in applied cooperative research;
- allow reduced teaching loads to faculty engaged in cooperative research. These loads should be decreased as the amount of research increases;
- appoint a liaison person within the departments to coordinate the submission of resumes and research background to the Resource Center. This individual can also serve as a liaison person to the Resource Center and department faculty;
- hold frequent discussions with departmental faculty interested in research to pool ideas and organize approaches to industry;
- address the issue of intellectual rights of industrialists and researchers and work out with industries such matters as patents, royalties, profit-sharing, etc., on an individual contract basis;
- formulate, with the assistance of trained staff, well-designed research plans and detailed proposals. Once this is completed, they must keep to project schedules and reporting deadlines. Finally, they need to complete project on time, give oral and written presentations, and do project follow-up with company representatives to ensure that results are well-understood and to assist in practical applications.

### MANUAL RECOMMENDATION CHECK LIST

A summary of recommendations from the manual distributed at the conference is given below.

Specific recommendations are given for consideration by the private sector, the research institutions, and the government. Each of these recommendations has been identified from experience gained during the operation of the Institutional Excellence Project:

#### PRIVATE SECTOR

- ✓ Establish and fund Resource Center and Supervisory Unit
  - compile a data base of industry problems
  - compile a data base of researcher expertise
  - serve a liaison function between industry and researchers

## RESEARCH INSTITUTIONS

- ✓ Revise/amend policies on:
  - released time -- adjustment of teaching loads and other duties for researchers involved in cooperative research
  - financial incentives -- adequate financial compensation should be provided for researchers engaged in the cooperative applied research. Researchers should also receive a share of royalty or license fee income resulting from successful commercialization of research results.
  - career incentives -- provide career incentives and credit toward promotion for participation in cooperative research
  - promotional assistance -- assist in organizing and publicizing information on research institution capabilities
  - industry contacts -- assist researchers in making industrial contacts and the process of formulating formal agreements
  - departmental liaison -- designate liaison person as contact for Resource Center
  - submit individual resumes -- prepare resumes emphasizing expertise for industry and submit to the Resource Center
  - pool information within research unit to identify major areas for industrial cooperative research
  - seek cooperative arrangements through the Resource Center and companies related to fields of expertise

## GOVERNMENT

- ✓ Provide financial support for applied research projects and cooperate in the operation of the Resource Center
- ✓ Provide necessary policy changes at government level for industry and research institutions to stimulate and encourage cooperation

# MANUAL

## SUSTAINABLE PUBLIC SECTOR - PRIVATE SECTOR COOPERATION

### FOR INDIGENOUS TECHNOLOGY DEVELOPMENT

Sponsored By

UNITED STATES AGENCY  
FOR  
INTERNATIONAL DEVELOPMENT (USAID)

FEBRUARY 26, 1994

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## EXECUTIVE SUMMARY

This manual is divided into two sections. **Section I** covers the need for cooperation between the private industrial sector and research institutions in order to develop indigenous scientific technology, and the role of the University Grants Commission (UGC)/USAID's Institutional Excellence Project (IEP) in developing this cooperation. IEP was designed to identify sources of scientific expertise and industrial technological needs and bring them together to work cooperatively to find solutions. Fourteen companies, who formulated sixteen problems, were identified and were brought together with departments and centers from six universities. Working agreements were concluded and the projects undertaken had a successful completion rate of 85 percent.

During this process, impediments which hindered the development of a climate conducive to industrial/research unit cooperation were identified. After the projects had gotten underway other obstacles to the promotion of successful cooperation were identified. Finally, upon completion of the sixteen projects, presentations were given to present the findings from the research efforts.

This section also briefly discusses funding categories provided by the IEP which forms a beginning basis for future funding needs.

Finally, a brief survey of the project accomplishments are given.

**Section II, Part A**, is based upon the lessons learned from the project. It proposes solutions and mechanisms to sustain future cooperation on a larger, national scale. These are contained in a set of recommendations which are divided into three major categories. The first category of recommendations concerns setting up an institutionalized Resource Center, staffed by data base and liaison specialists. Its first function is to set up a data base of qualified scientists and identified industrial problems, to serve as a nation-wide clearing house for industrialists and for researchers seeking cooperative arrangements for solutions to problems. A second function is to develop an outreach program by giving seminars to Chambers of Commerce and scientific research centers to publicize the Centers' information base and capabilities. Finally, well-trained staff members will serve a liaison function between scientists and industrialists who are engaged in cooperative activities.

It is also recommended that a Supervisory Unit be set up that will report to the appropriate levels in the Government of Pakistan to recommend appropriate policies to overcome obstacles and to stimulate cooperative efforts. This committee should be made up of representatives drawn from industry, the research sector, and the government sector, on a rotating basis. The committee will also monitor the operation of the Resource Center. A chart illustrates the organizational setup.

The second category of recommendations concerns the role of the scientific institutions and

necessary policy formulations that must be made for cooperative research such as: released time, financial incentives, merit awards and credit toward promotion for applied research, the establishment of a liaison office, and publicity.

The third category of recommendations concerns questions of funding and the role of the Government of Pakistan in promoting monetary assistance and guidance.

**Section II, Part B,** develops a model of how these proposed solutions and recommendations can promote cooperation between industry and research institutions by providing a step-by-step outline of the research process: the initial contact, the formulation of the proposal, the formal agreement, progress reports, schedule deadlines, project completion reports, and follow-up. A flow chart illustrates this process.

**Section II, Part C,** presents a summary of the most important findings from the Institutional Excellence Project.

**SECTION I**

**OVERVIEW OF**

**SUSTAINABLE  
INDIGENOUS TECHNOLOGY  
DEVELOPMENT**

## **SECTION I OVERVIEW OF SUSTAINABLE INDIGENOUS TECHNOLOGY DEVELOPMENT**

### **A. BACKGROUND: NEEDS, RESOURCES, AND INSTITUTIONAL EXCELLENCE PROJECT OBJECTIVES**

Major portions of industry in Pakistan now depend heavily on the utilization of imported technology, but the need for indigenous technology development for economic and social improvements is becoming critically important. The Institutional Excellence Project focussed on these needs and available national strengths to provide a sound mechanism of cooperative applied research between private sector industry and research institutions to accelerate indigenous technology development.

#### **1. The Need for Increased Industrial/Research Institution Cooperation**

Major portions of industry in Pakistan now depend heavily on the utilization of imported technology. Imported technology, however, is frequently not at the cutting edge. The pay-back period for high cost technology plants and equipment is relatively long. On the other hand, the continuous flow of new and more efficient technologies can make the previous technology obsolete in a few years. Thus the recovery of the cost of adopting the technologies becomes very difficult. In most cases the maintenance base required for more refined high technology industries is not available in the country; thus imported spare parts and maintenance services are required which add to the cost of production. Consequently, many companies in Pakistan are left in a less competitive position in what has now become a global market. Thus, there is a major need to create such indigenous and globally competitive technology.

#### **2. Resource Availability**

Training during the last ten or more years of a significant number of university faculty members and other scientists and engineers to the highest levels of science and technology on world standards provides an untapped reservoir of research talent. Work under the USAID Institutional Excellence Project (IEP) has shown that this talent can be successfully applied to broad areas of industrial problem solving.

#### **3. The Lack of Coordinated Industry/Research Institution Cooperation**

Despite this pool of highly trained personnel, there has been little research on indigenous technology. A few individual researchers have potential contacts resulting from personal knowledge of industrial activities. However, organized, financially supported efforts by designated individuals in the institutional administration to establish broader and larger working arrangements are absent.

Industry, on the other hand, also has not sought this development. It does not carefully examine the potential value of cooperation, define important specific problems requiring expertise or services which it does not possess, nor make efforts to actively seek individuals who could provide solutions. The two sides do not come together to agree on specific approaches, time-tables, and a definition of satisfactory results. Only when objectives and requirements are clear, a level of financial support is defined, and the responsibilities are clearly understood can collaborative interactions be fruitful for both sectors.

#### **4. Institutional Excellence Project**

The IEP was designed to bring industry and researchers together to work in joint cooperation and to overcome the lack of communication and cooperation outlined above. The Institutional Excellence Project (IEP) was set up after a joint analysis by the USAID and the University Grants Commission of the needs and possibilities for improvement in the output of university research directed toward national economic goals. The analysis considered the present geoeconomic situation in high technology sectors, the need for increased industry/research institution cooperation, the present status of applied industrial research, the present and potential availability of expertise in universities and other research institutions, and the factors favoring or impeding the results of applied research efforts.

The IEP was structured to demonstrate the capabilities of university departments and centers to complete practical applied research for industry by establishing sixteen projects in six universities working in cooperation with fourteen companies to work on industry designated problems, the solution of which would provide immediate economic benefits. The results of the IEP provides the basis for a manual incorporating a set of recommendations which are discussed in Section II.

In promoting indigenous applied research, the IEP initially encountered a number of difficulties which had to be overcome. These can be classified as pre-operational obstacles and operational difficulties that must be removed or improved.

## **B. PRE-OPERATIONAL IMPEDIMENTS TO COOPERATIVE INDUSTRY AND RESEARCH EFFORTS**

These pre-operational impediments are: lack of awareness of research capabilities by industry; lack of confidence by industry; the absence of policies on intellectual rights such as patents, licensing fees, and royalties; the lack of research resources; and the lack of incentives for researchers. Recommendations to overcome these difficulties are addressed in Section II.

### **1. Lack of Awareness of Research Capabilities by Industry**

An overriding obstacle to effective cooperation for IEP was the lack of awareness of research capabilities. Outside of routine testing in a few departments and a small amount of consulting on a personal basis, no formal arrangements for cooperation with industry were discovered. Only when this information was disseminated to a large number of companies was any interest aroused in possible cooperative efforts by the industrial side.

The dearth of information on possible collaborators was also evident on the researcher side. Instances of approaches to companies by universities were reported, with little or no success, but no concerted effort to determine industrial needs and interests were found. Any sustainable cooperative scientific development must overcome this communication problem.

### **2. Lack of Confidence by Industry**

The next difficulty occurred when preliminary discussions were held with selected industrial companies on potential projects. The initial reaction by industrial representatives in all cases was a lack of confidence in faculty/researcher expertise, and in their ability to work in an industrial environment. Strong doubts existed about researchers' understanding of industrial needs and the industrial process, their ability to conduct research on practical problems, and their ability to deliver results within the short time scale required by industry. This can be overcome relatively simply by improving communication.

### **3. Intellectual Property Rights for Industry**

It was reported that there was no adequate system to ensure intellectual rights or property, that is, for any profits or patents to be awarded to industry, which resulted in reluctance on the part of industry to support collaborative research projects.

### **4. Lack of Resources for Researchers**

In most research institutions, financial resources available for research work have been scarce. The limited resources available from government budgets were frequently not provided in a timely manner for research activities which resulted in inefficient utilization and loss of time.

The rules for obtaining financial assistance for research work were not properly understood by most research workers; others also reported the rules to be lengthy and cumbersome.

Further, industry incentives for supporting cooperative applied research were reported to be non-existent.

Researchers have a feeling of futility in proposing cooperative efforts, because of lack of response to overtures on possible support, which, in most cases were made on an individual basis. These overtures, usually were general, unstructured, and indefinite.

#### **5. Lack of Incentives for Researchers**

It was reported that incentives within the research institutions to undertake cooperative applied research did not exist. Not only were research workers not rewarded financially, but, recognition of their efforts was also not reflected in their career advancement.

### **C. OPERATIONAL DIFFICULTIES**

During the operation of the research projects, certain operational difficulties surfaced. These were poor proposal writing; the lack of research progress and project reporting by researchers; the lack of priority accorded to projects by administrators; and the lack of financial management procedures.

#### **1. Inexperienced/Ineffective/Casual Proposal Writing by Researchers**

The initial tendency by researchers was to prepare minimal proposals, which needed substantial revision before they could be submitted. While researchers were quickly able to respond with practical approaches to problems identified by the companies, they had considerable difficulty in translating their ideas into practical terms such as identification of necessary financial support levels needed and the formulation of written proposals. Considerable discussion and reformulation of proposals using a designated format developed under IEP were required prior to formal review by industry representatives. The development of a model format and the need to publicize it is discussed in Section II.

#### **2. Lack of Research Progress and Project Reporting by Researchers**

In general, research activities were carried on diligently, in spite of some major delays in delivery of necessary equipment and commodities by the suppliers. However, in several of the research units the activities were carried on in the usual academic mode, without sufficient attention being given to frequent contact with technical and managerial company personnel and provision of adequate and timely progress reports.

Continued discussion among industrial representatives, researchers, USAID personnel and Pakistani consultants improved the reporting situation, and finally resulted in well prepared and thoughtfully presented summaries of results by researchers in a project workshop which reviewed the results of all of the projects in conjunction with industrial representatives.

### **3. The Lack of High Priority and Timeliness Provided by Research Administrators**

It became apparent that a high priority to project activities was not granted by most university administrators, which, at times, seriously hampered the progress and resulted in loss of enthusiasm by both of the collaborating partners. This also resulted in a loss of confidence of industry in the research institution's ability to deliver results in a timely manner.

### **4. The Lack of Financial Management by Research Institutions**

An efficient but simple, central financial management system was not available at most research institutions. The principal investigators were expected to maintain the project accounts themselves. Since a number of researchers were not fully conversant with financial rules and regulations, financial reporting at times created difficulties and delays.

## **D. SPONSORED PROJECTS**

Under IEP, sixteen projects involving twenty six researchers located at six universities, working in collaboration with fourteen companies were identified with the assistance of Pakistani consultants.

These projects are listed in Table I. Thirteen out of the sixteen research projects met their objectives, establishing a highly successful 85 percent completion rate.

## **E. FUNDING**

Certain funding requirements were necessary to promote indigenous research. In the IEP these necessary expenses included the materials and equipment needed to accomplish the various projects. Consultants were necessary to locate companies who identified technological problems they wished to solve. Supervisory personnel were also necessary to assist in the management of this initial program.

## **F. CONCLUSIONS**

Building upon the experience of the IEP, a set of specific recommendations have been formulated upon which to build an operational guide. These recommendations are given in Section II, A. Section II, B also provides a model that illustrates how the cooperative process would work.

**TABLE I**  
**INSTITUTIONAL EXCELLENCE PROJECT (IEP)**  
**AT A GLANCE**

Research Institution	Counterparts	Number of Projects	Title
NCEG, Peshawar	Khawaja Glass Co. Khawaja Glass Co. Khawaja Glass Co. OGDC	Four	1. Identification & Characterization of Quality of Silica Sand for Glass Making 2. Inclusion Studies of Sheet Glass 3. Review of Analytical Processes at Khawaja Glass Company 4. Sedimentological Studies in Potential Hydrocarbon bearing Strata
QAU, Islamabad	Bio-Tech Ciba Geigy, Multan	Two	1. Bating Enzymes from Animal Sources 2. Bioinsecticides in the Control of Insect Pests of Cotton
UET, Lahore	Descon Escorts Multiline	Three	1. Microprocessor based Multimetering, Energy & Tariff Meter 2. Design & Development of an Expert Logic Controller 3. Uninterrupted Power Supply (UPS)
CEMB, Lahore	Ciba Geigy, Lahore Punjab Drug House, Lahore	Two	1. Microbial Control of Insect Pests in Cotton 2. Hormone Receptors as Prognostic Factors in Health & Disease
GOMAL, D.I. Khan	PCSIR STEDEC	Two	1. Commercial Exploitation of Taxol Anti-Cancer Drug 2. Commercial Exploitation of Azadirachtin
HEJ, Karachi	Hamdard Labs. Ehsanullah Labs. A.K. Labs.	Three	1. Investigation of Medicinal Plants for Anti-Diabetic Activity 2. Bating Enzymes from Animal Sources 3. Development and Pilot Plant Production of Medical Diagnostic Kits
<b>GRAND TOTAL</b>			
<b>6</b>	<b>14</b>	<b>16</b>	

NCEG = National Centre of Excellence in Geology, University of Peshawar  
 QAU = Quaid-i-Azam University, Islamabad  
 UET = University of Engineering & Technology, Lahore  
 CEMB = Centre of Excellence in Molecular Biology, Lahore  
 GOMAL = Gomal University, D.I. Khan  
 HEJ = H.E.J. Research Institute of Chemistry, University of Karachi

**SECTION II**

**RECOMMENDATIONS**

**AND**

**PROCESS MODEL**

## **SECTION II. RECOMMENDATIONS AND PROCESS MODEL**

This manual is based on the experience gained from the operation of the Institutional Excellence Project (IEP). It formulates a set of recommendations designed to serve as a specific operational guide to universities, research institutions, industry, and representatives of the Government of Pakistan, for the establishment of effective working relationships between industry and the research sector in order to provide sustainable and indigenous technology.

The first part, part A, summarizes the general findings from the operation of the IEP. It also includes specific recommendations for the establishment and enhancement of a systematic approach for the continuation and expansion of the initial project approach. Part B contains a model which illustrates how the cooperative research process works.

The manual is not intended to be a final document, but a beginning effort which can assist in the establishment of relationships and avoid major problems and pitfalls which were observed in the pilot program. It is anticipated that the manual will be continually updated as improvements are noted in the continuing cooperative process and operational details are developed.

### **A. MANUAL RECOMMENDATIONS**

Following are the recommendations which can serve as a guide to the cooperative development of indigenous technological research between researchers and the private sector. The recommendations fall into three categories: industry's role and contribution, the research institution's role and contribution, and the government's role and contribution.

#### **1. Industry's Role and Contribution: The Resource Center**

If research cooperative efforts are to develop in the future and on a larger scale, industry will have to play a more active role by promoting and supporting the institutionalizing of a RESOURCE CENTER.

It became abundantly clear during the development of the IEP that such a Resource Center was necessary. This Center should serve four functions. It can:

- *compile a data base* of industry problems;
- *compile a data base* of faculty expertise;
- *formulate an outreach program* that gives seminars at regional research institutions and Chamber of Commerce Centers on ongoing research programs, available researchers and their expertise, and industrial problems in need of research, and finally,

- ***serve a liaison function*** by matching backgrounds of expert researchers with potential industrial problems, establishing contacts for possible cooperative arrangements, facilitating continued discussions between company personnel and researchers, and assisting in the formulation of cooperative research proposals, budget planning, and arrangement of final agreements.

Because it is highly likely that research requests will in most cases generate first from the industrial sector, it is recommended that the Resource Center be located in the private sector.

The permanent staff of the Resource Center should consist of a manager and, as a minimum staff, two data base specialists, and three liaison specialists.

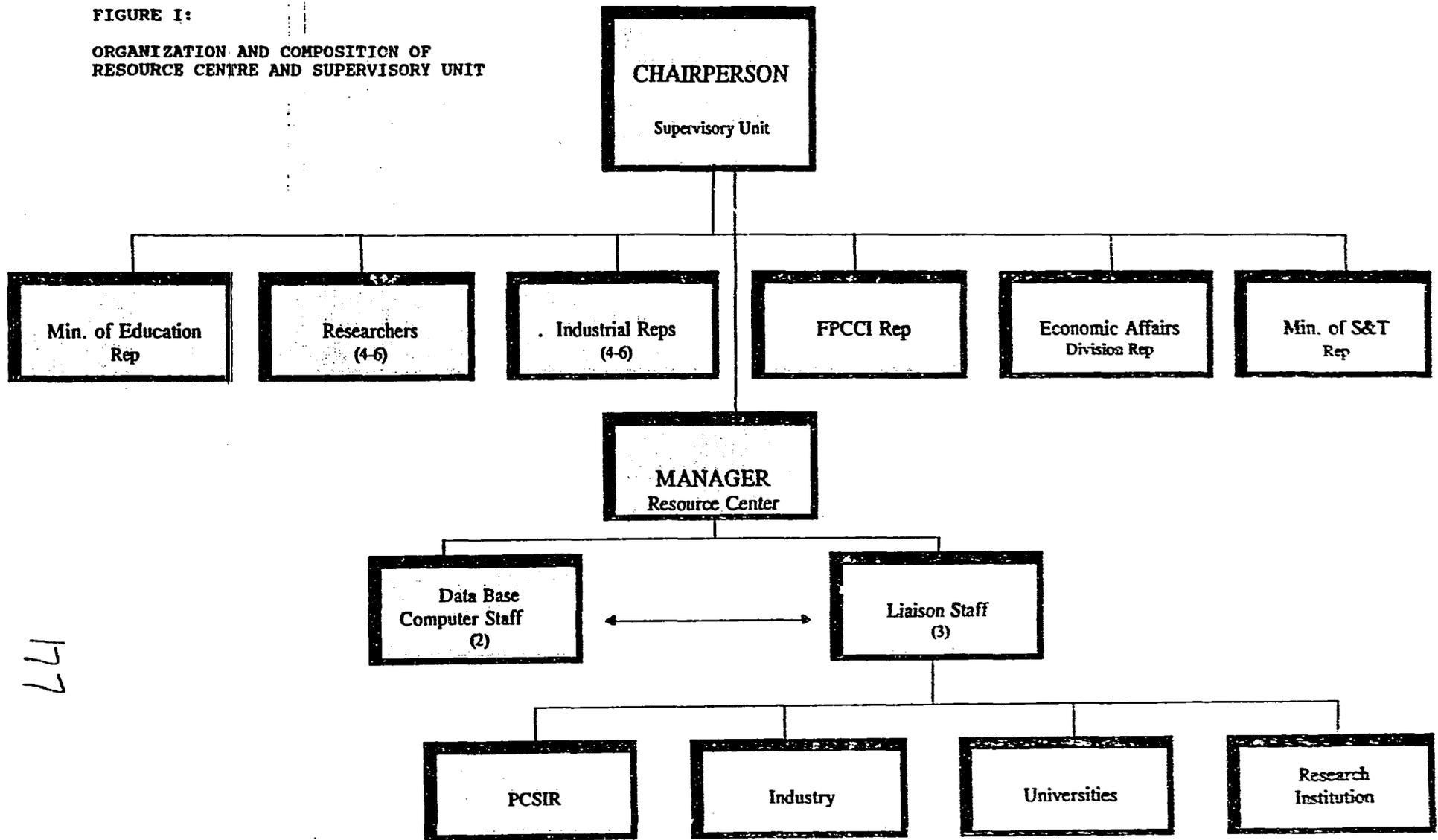
A Supervisory Unit should also be formed. This Supervisory Unit should be composed of representatives from industry and the research sector, appropriate government representatives, and representatives from the Federation of Pakistan Chambers of Commerce and Industry. Specific suggestions for membership are shown on an organizational chart, Figure I.

The Supervisory Unit should:

- ***assess and establish mechanisms*** for cooperation, manage the establishment of the data banks in the Resource Center and oversee the continuous liaison work between industrial firms and research units, and organize and direct other activities of the Center;
- ***make recommendations on necessary policy and procedure revisions*** to government, industry and research units.
- ***propose necessary budgets, sources, and mechanisms*** to provide interim support for projects until private sector support is sufficient to support the cooperative efforts;

FIGURE I:

ORGANIZATION AND COMPOSITION OF  
RESOURCE CENTRE AND SUPERVISORY UNIT



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- *recommend and assist in appropriate training programs* for technical personnel, administrators, and technical counterparts in the essential requirements for successful industry/research unit cooperation;
- *seek cooperative funding support* from private sector firms and manufacturer's associations.

## 2. Research Institution's Role and Contribution

A major responsibility for developing technological research rests with the research sector. The initiatives of the researchers and the departments can only be successful with the support and encouragement of institutional administrators. Therefore the administrators at research institutions should make an official commitment to seek and to promote such a relationship. This commitment can be demonstrated by restructuring rules and regulations to facilitate cooperation and provide incentives for participants. These new rules should include:

- *released time* -- teaching loads and other duties should be adjusted for researchers engaged in cooperative research. Loads should be decreased as research participation increases;
- *financial incentives* -- adequate financial compensation should be provided for researchers engaged in the cooperative applied research. Researchers should also receive a share of royalty or license fee income resulting from successful commercialization of research results.
- *career incentives* -- an organized program of incentives should be provided to encourage the extra effort required to participate in this type of activity. It is also urged that service rules/career structure be adjusted to give credit toward promotion to faculty members for success in cooperative research;
- *promotional brochures assistance* -- the institutional administration should assist the researchers in their preparation of brochures by supporting and coordinating the preparation, organization and distribution of information on faculty capabilities;
- *making contacts* -- institutional administrators should assist in making contacts with potential sponsors, in meetings with company executives, appearances at Chambers of Commerce, Rotary Clubs, and technical associations. When discussions are being held with specific companies, attendance at crucial meetings by institutional administrators would add the weight of the institution in support of the negotiations.

Institutional administrators are urged to publicize the expertise and capabilities of their personnel, to establish working arrangements and facilitate work in progress. There are a number of actions that departmental administrators and faculty can take collectively which will fulfill these responsibilities:

- *departmental/institutional liaison* -- the department should designate a departmental liaison person as the contact person for routine interactions with the Resource Center, enabling the researchers to stay current with possible research possibilities with industry. This liaison person should also be responsible for overseeing the collection of resumes and ensuring that they are forwarded to the Resource Center;
- *promoting group discussions* -- the department/institution can promote a research atmosphere by having its members meet in a group to assess members' capabilities and interests and agree to focus on applied research; and by
- *publicizing capabilities* -- brochures (not necessarily elaborately printed) should be prepared and sponsored by the institution which emphasize aspects of researcher expertise appropriate to industrial activities, with particular reference to the areas of technology which can be improved by researcher participation.

The major responsibilities of the research staff are to:

- *prepare brief individual resumes* which emphasize potential industrial applied research capabilities, for circulation as needed;
- *participate in the pooling of information;*
- *seek cooperative arrangements* by interaction with the Resource Center and companies related to their fields of expertise.

### **3. Governmental Funding and Policy Changes**

It is imperative that the Government of Pakistan recognize the importance of cooperative research activities and provide sufficient resources to encourage these efforts.

For expansion of cooperative applied research as conducted under the IEP, the government, at least in the early stages, must provide both substantial financial support and review current administrative policies to overcome existing impediments. A detailed description of necessary support is provided below. The recommendations presented here are based on experience gained during the project operation, and the results of the analyses of the lessons learned.

- **Provision of Financial Support** -- It is recommended that, at least for the first five years, the government provide substantial funding for cooperative research materials, equipment and salaries. Possibly, the private sector can bear 25% of the equipment and research materials at first.

The government should also assign to the University Grants Commission (UGC) or another body the responsibility to facilitate, supervise and encourage such activity and provide the necessary guidelines to govern it.

Only research projects which designate specific industrial partners and develop formal plans and agreements for cooperation should be eligible for support from the revolving fund.

Since funds will be needed to establish the financial management units at research institutions, it is recommended that these funds be included in additional government allocations. Also, funds should be provided for the liaison individual in departments who arranges meetings, collects resumes, prepares promotional brochures, etc.

Besides research support, a significant additional expense would be the Resource Center and its staff. This expense should be borne by the private sector with initial support by the GOP.

Finally, some funding would be required for the Supervisory Unit.

- **Policy Changes** -- The government should foster a positive research atmosphere by permitting reduced teaching loads, providing financial incentives, and merit toward promotion to be based on successful research.

## **B. PROCESS MODEL**

The following discussion illustrates the step-by-step process whereby cooperative agreements are begun and brought to a successful conclusion:

### **1. Initial Contacts**

The first step in the process is bringing together the scientific personnel and companies who need solutions to industrial problems, to formulate research proposals.

**Initiation by Industrialists** -- The initial contact can be made by industrialists in a number of ways. Industrialists may contact the Resource Center to request assistance on industrial problems. Industrialists may also be made aware of these research capabilities at Chambers of Commerce presentations, given by the Resource Center at regional capitals or from reading the promotional brochures sent to the Chamber of Commerce units by the Resource Center, then make contact with the Resource Center in order to ask for qualified personnel to work on these problems.

If contact is made by the industrialists, the Resource Center can use their data base to identify appropriate personnel. Once the prospective research personnel have been identified, a comprehensive discussion of cooperative arrangements should be held.

*Initiation by Researchers and Research Institutions* -- If contact is made by university or other researchers who are seeking cooperative projects, a search of the data base in the Resource Center outlining industrial needs and contacts can be one way to start the cooperative research process. Awareness can also come through attending seminars given by the Resource Center staff at scientific institutions. Contacts by Resource Center liaison personnel can result in locating industries interested in further discussions and possible cooperative arrangements. Again, once this is done, preliminary discussions between researchers, Resource Center liaison personnel, and the company should be held to determine whether the proposal is feasible. Figure II illustrates this process.

## **2. Preliminary Research Proposal**

*Project Research Planning Proposal* -- The careful formulation and execution of the proposal is extremely important, because it forms the basis of a company's perceptions of the university and potential researchers.

Researchers are advised, once a preliminary contact has been made, to gather as much information as possible about the company and its present and potential markets, and be prepared to present recommendations and specific research plans at the first formal meeting.



After the researchers and the company make a preliminary commitment to work together on an industrial problem, personal contacts between researchers and industrial technical personnel and managers ought to be extensive. The negotiations should be assisted as necessary by the Resource Center liaison personnel. Through these contacts and discussions the proposed problem may be defined precisely and the objectives clearly understood by both parties. This is essential for the successful completion of such cooperative work. It is particularly critical for extensive and large projects.

Care must be taken to specify individual budgets for each unit, overall administrative responsibilities for research areas, and overall administrative responsibilities for project operation.

The preliminary plan should include:

- a list of faculty and staff participants with designated responsibilities
- a design of the research program
- a list of necessary industrial personnel who will participate, with designated responsibilities
- a proposed time schedule
- a schedule for reporting (scheduled meetings, methods of reporting, etc.) and for final presentation of results (e.g., assembled equipment to be delivered, provision of sample test results, etc.).
- a proposed arrangement on distribution of intellectual property (publications, software ownership, patents, copyrights, etc.) and on questions of royalty payments, license fees or other compensation
- funding sources

Considerable discussion and reformulation of proposals, using a designated format developed under the IEP, are required before a formal review by industry representatives. A suggested format for the project proposal is given in Annex I.

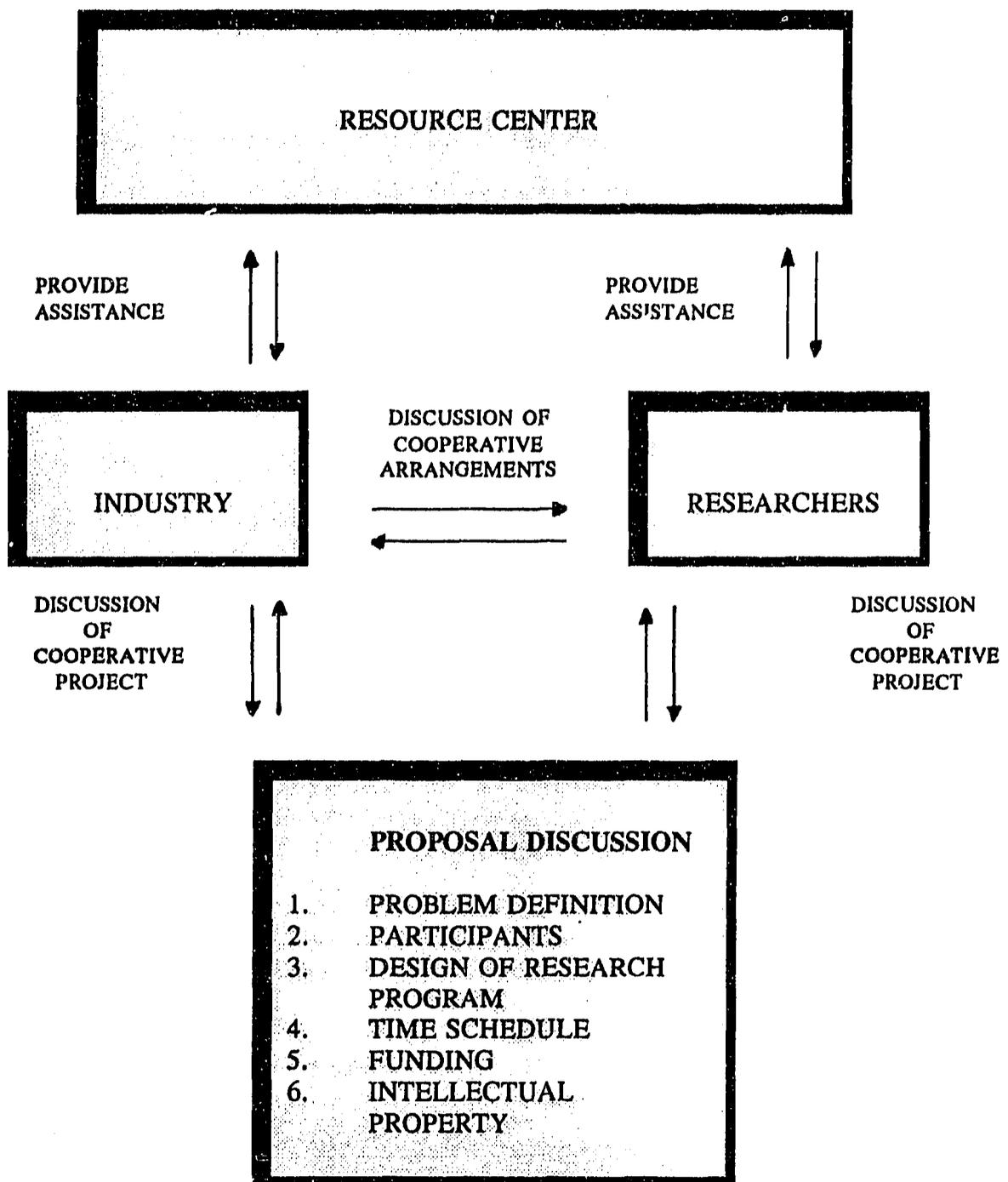
Figure III. Illustrates this process.

### **3. University/Research Institution Support**

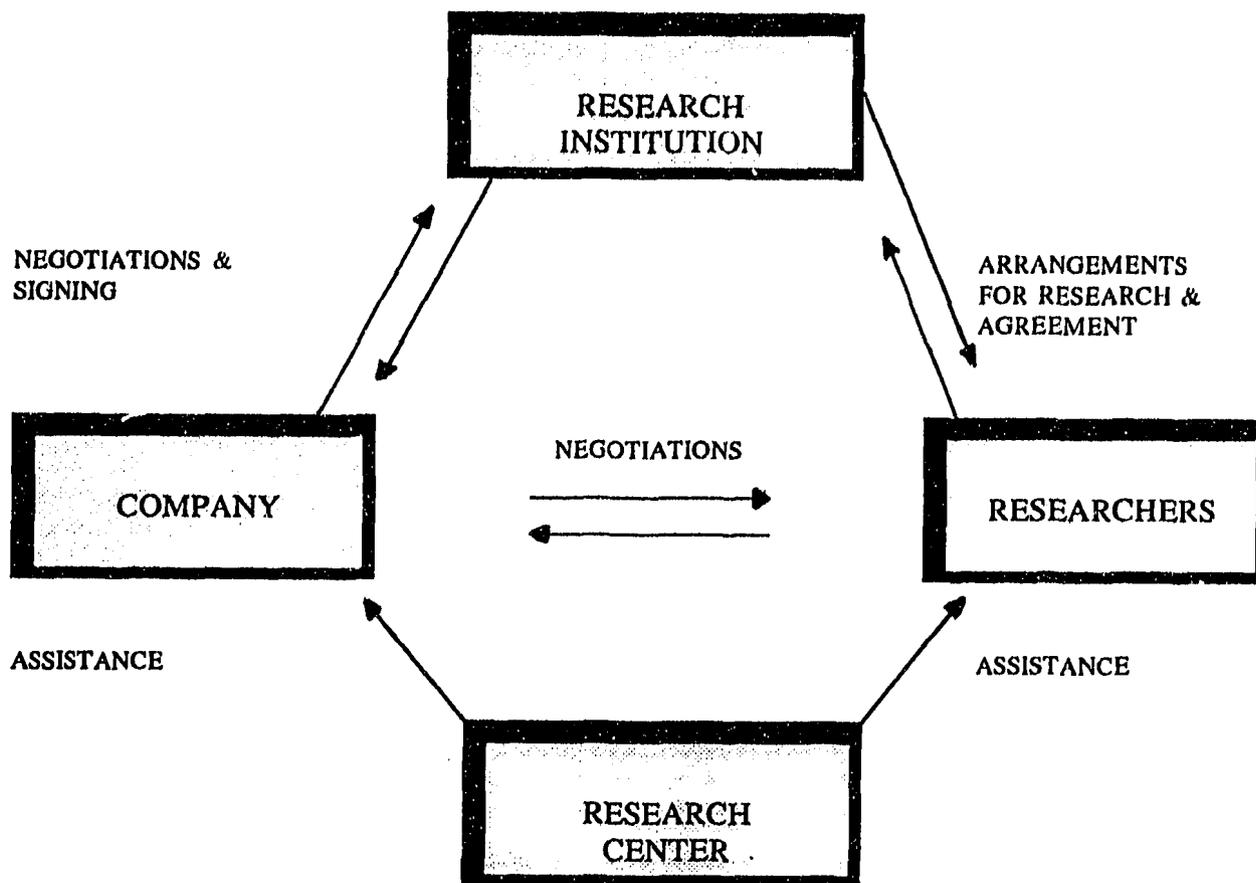
Once a university/research institution has made an official commitment to seek and to promote industrial cooperation, and certainly no later than when proposal negotiations are taking place, it should establish a financial unit for research for record keeping and financial management. This unit should have the authority to monitor expenditures and be responsible for periodic financial reporting to the company. Arrangements in the financial area should include details of financial incentives for faculty participants and agreements on distribution of indirect costs to the university. Again, all this needs to be in place or designated before the agreement is signed.

### **4. Formal Agreement**

After acceptance of the proposal by the company, a formal agreement should be prepared and signed by both parties. Figure IV illustrates this process.



**FIGURE III. THE DEVELOPMENT OF THE RESEARCH PROPOSAL**



**FIGURE IV. THE FORMAL AGREEMENT**

Because rapid completion of project planning is an essential requirement from the industrial standpoint, every possible effort should be made to complete arrangements as soon as possible. After some experience the entire process can be completed in one month or less.

### **5. Research Progress**

Because rapid completion of projects is an essential requirement from the industrial standpoint, the principal investigator should make every possible effort to complete the research as soon as possible. The Principal Investigator should establish definite time schedules for discrete phases of the research program and continually emphasize their importance to the research staff.

### **6. Research Reports**

Reporting to the company can take a variety of forms but should be frequent, with individual visits not only to technical representatives, but also to high-level management.

Regularly scheduled written reports should be presented promptly, and significant achievements which occur should be particularly emphasized. A suggested format for written reports is given in Annex II.

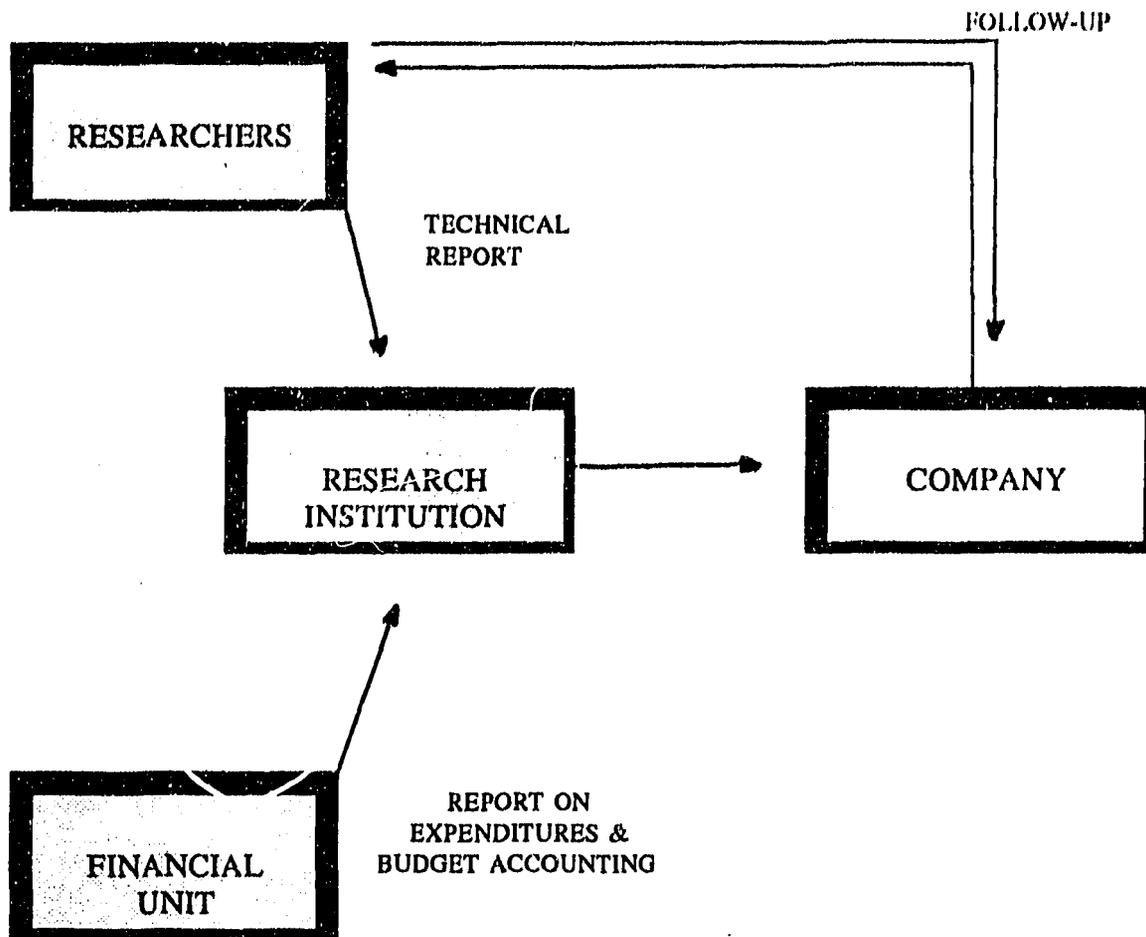
### **7. Final Reports: Oral and Written**

At project completion, a detailed oral presentation of findings should be arranged with appropriate company representatives, followed by a comprehensive written report which includes an analysis of the commercial value of the results achieved, and suggestions for additional research activities. For maximum effectiveness this report should be submitted immediately after the schedule project completion date.

### **8. Project Follow-Up**

After project completion, principal investigators should plan periodic follow-up visits to the company to determine the ultimate effectiveness of the research, to offer continued cooperation and to maintain contacts with company personnel.

Figure V illustrates the process for final reports and follow-up.



**FIGURE V. THE RESEARCH REPORTS AND FOLLOW-UP**

### **C. SUMMARY: FINDINGS FROM THE IEP PROJECTS**

During the progress of the project a number of findings were established.

After determining that indigenous technological research is vitally needed, a pool of highly trained scientists were identified.

Collaborative applied research work may be successfully accomplished as the IEP experience proved.

Projects which were proposed by company as being in need of solutions were managed by twenty-six researchers and came to a successful 85 percent conclusion rate, thus initiating two-way communication between the researchers and the private sector and improving significantly the research equipment at the participating research institutions.

The findings include the following:

- pre-operational and operational impediments were identified;
- the need for a Resource Center, its functions, and necessary staff expertise were identified;
- the policy changes in the research institutions that are necessary to promote research were identified;
- the necessary funding needs from the GOP and other donors, as well as necessary policy changes were identified;
- a sustainable program for the continuation and expansion of industry/research institution cooperative research was created, and finally,
- a model was created that illustrated the cooperative research process

## ANNEX I

### PUBLIC SECTOR-PRIVATE SECTOR COOPERATION FOR INDIGENOUS TECHNOLOGY DEVELOPMENT

#### SAMPLE PROPOSAL FORM INDUSTRY/RESEARCH INSTITUTION COOPERATION

I. **TITLE:** (Give a title which identifies the problem to be solved)

II. **INTRODUCTION:** (Give an overall summary of discussions with the company, proposed cooperative activities, preliminary arrangements on cooperative agreements, etc.)

#### III. **PROJECT DETAILS:**

a) **Background:** (Give a brief description of the industrial source of the problem; the difficulties caused by the problem, and the economic importance of the problem in an industrial and/or national sense. Finally, list the specific objectives of the proposed work.)

b) **Technical Description:** (Give all of the important details of the various aspects of the research/development problem to be solved. This should include a technical description of the background and brief discussion of current status of work in progress in the field. A brief description of previous work in the field by the proposer, if any, should also be included.)

c) **Scientific/Technical Contributions of the Project** (Give a brief description of the technical results to be achieved.)

d) **Methodology and Work Plan:** (Describe the theoretical/experimental techniques to be used to carry out the proposed work)

e) **Proposed time schedule:** (Give a proposed time schedule for each major project objective or activity)

f) **Industrial Cooperation/Participation:** (Give details of participation/support to be provided by cooperating industry/company. Include any special arrangements to be made, such as industry personnel involved (including the primary contact person), financial support, secrecy agreements, royalty arrangements, publication rights, etc.)

g) **Utility/Benefits:** (Describe potential usefulness and economic benefits to be derived from successful solutions to the problem(s), including those which have potential for immediate application.)

**IV. PRINCIPAL INVESTIGATOR: (Name/Title)**

**V. CO-PRINCIPAL INVESTIGATOR(S): (Name(s)/Title(s))**

**VI. AFFILIATION: (department/centre/university)**

**VII. DURATION OF SUPPORT: (months)**

**VIII. TOTAL FUNDS REQUESTED:**

**IX. PROJECT STRUCTURE:**

**a) Personnel: (List personnel to be involved including duties and responsibilities)**

**b) Available Facilities/Equipment: (List facilities and equipment available for use in the project.)**

**c) Resources Required: (Describe and justify any special major items of equipment/facilities required to complete the proposed project.)**

**d) Budget: (For amounts requested, list overall figures for each category. For Principal Investigator, co-Principal Investigators, and research staff list compensation requested. List overall budget for permanent equipment and show specific details for equipment requested in table below. Under OTHER category list specific items requested, such as travel, audit fee, analyses, services, etc. Justify any unusual requests, such as large requests for analytical services, large requests for in-country travel, etc.)**

**1. Compensation:**

**2. Equipment:**

**3. Supplies:**

**4. Other**

**5. Indirect Costs**

**e) Equipment Specifications: (In tabular form, give details for each item of permanent equipment requested, including model number if known, and quoted price or best estimate.)**

**X. APPROVALS: (Signature of Principal Investigator and other required authorizing officials, if any.)**

ANNEX II

**PUBLIC SECTOR-PRIVATE SECTOR COOPERATION FOR  
INDIGENOUS TECHNOLOGY DEVELOPMENT**

**SAMPLE: RESEARCH PROJECT PROGRESS REPORT OUTLINE**

Project: \_\_\_\_\_

Department/Center/University: \_\_\_\_\_

Principal Investigator(s): \_\_\_\_\_

Associated Staff/Students: \_\_\_\_\_

Associated Industrial Personnel: (Names/titles) \_\_\_\_\_

I. Objectives of the Project:

II. Project Accomplishments: (during report period)

III. Project Plan for Next Quarter:

**RELATED INFORMATION:**

1. Meetings of Researchers/Industrial Staff: (list each meeting, dates, locations, personnel attending, items discussed)

2. Problems encountered in conducting Project Operations:

3. Suggestions/Recommendations:

**PRESS RELEASE**

**BY**

**FEDERATION  
OF  
PAKISTAN CHAMBERS OF  
COMMERCE & INDUSTRY  
(FPCCI)**

## THE NEWS

February 16th, 1994

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# FPCCI setting up research unit

**By our correspondent**

**KARACHI:** The Federation of Pakistan Chambers of Commerce and Industry (FPCCI) is establishing a unit for research and development work at its office in Islamabad with a view to providing latest information on scientific and technological innovations on quality control.

According to Iftikhar Ali Malik, Acting President of FPCCI Pakistan has been lagging behind in agriculture and engineering sectors which are two important pillars of the country's economy and it is necessary that in order to achieve self-reliance in these sectors there should be close relationship between industry and Pakistani scholars.

He said Federation of Pakistan Chambers of Commerce and Industry was planning to bridge the gap between information and technology by developing a roster of the scientists and scientific research institutions in Pakistan who had capacity and capability for undertaking research and investigation in the areas of concern to the industry.

## R&D to accelerate industrial productivity: FPCCI chief

ISLAMABAD: Feb. 15: Mr. Iftikhar Ali Malik, Acting president of FPCCI said the Federation of Pakistan Chambers of Commerce and Industry (FPCCI) is establishing a unit for research and development at its office in Islamabad to provide periodically latest information and data on scientific and technological innovations and advancement for optimising industrial productivity and quality control.

In a press statement issued here today Mr. Malik said that self-reliance is one of the principal objectives of Pakistan. Its achievement necessitates that specific measures be taken to achieve it in the foreseeable future. Particularly in the agriculture and engineering sectors which are the two important pillars of Pakistan's economy. Pakistan has been lagging behind other developing countries in the South-East Asia region in these two sectors despite the fact that we have abundant material and human resources but we have yet to uncash their potential.

Agriculture is the foundation of our economy and our industrial growth is greatly dependent on it he added. He said our productivity in this sector leaves much to be desired. Not more than 20 per cent of our installed capacity in the engineering sector is in use. Our exports have been declining and we have not yet taken adequate steps to streamline our procedure and strategy to boost exports of value-added items or explore new markets overseas for exports.

It is essential that to achieve our national goal of self-reliance a close working relationship be established between industry and Pakistani scholars and scientific research institutions in order to investigate and promote industry related issues.

He said FPCCI plans to bridge the information and technological gaps that exist today and will support research and development on the vital and basic scientific issues concerning the industry in Pakistan.

For this purpose FPCCI's R & D unit will develop a roster of the scientists and scientific research institutions in Pakistan who have capacity and capability of undertaking research and investigation in the areas of concern to the industry.

FPCCI is currently undertaking a through review of its management and financial resources in order to avoid any wastage. As a measure of strict economy, FPCCI's president and office-bearers will themselves bear any expenses involving travel and related expenses incurred during the performance of their FPCCI related activities and duties.

This should help also in generating funds for supporting R & D activities. ---- PPI

## FPCCI establishing research and development unit

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Malik further mentioned that FPCCI is currently undertaking a thorough review of its management and financial resources in order to avoid any wastage. As a measure of strict economy, FPCCI's president and office-bearers will themselves bear any expenses involving travel and related expenses incurred during the performance of their FPCCI related activities and duties. This should help also in generating funds for supporting research and development activities.