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To: Dr. Ruth Frischer,
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Fr: Dr. James E. Rollings
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Dt: July 7, 1995

Re:

Dear Dr. Ruth Frischer;

Attached please find a revised copy of the Annual Report for 1994 which contains all of the sections as listed in your memo of June 22, 1995. Additional copies will be mailed to you this coming week.

Thank you for your interest in our linkage.

Annual Report FY 1994

(revised)

July 7, 1995

Dr. James Rollings, P.I.
Director of Latin American Programs
Worcester Polytechnic Institute
Worcester MA, 01609

A. a description of the past year's activities under each linkage objective

Objective #1 - Planning for WPI Project Center and Faculty Development

Several areas of Planning Activities occurred during FY 1994:

- 1) The advancement of new academic programs at ESPOL. Specific for this year is the proposal jointly advanced by ESPOL and WPI on Risk Management for New Product and System Development. This program is a direct outgrowth of ESPOL's strategic and operational planning process, and was partially drafted by the two junior ESPOL faculty now pursuing master degrees in WPI's Management Department.
- 2) The creation of a centralized library of information on WPI at ESPOL. This library includes data on the UDLP and the specific proposal under which WPI and ESPOL are operating, WPI faculty research interests and WPI catalogs of graduate courses and program descriptions, and complete set of literature on WPI's unique project based educational system. This information is maintained in the office of the vice rector (Carlos Becerra) at ESPOL.
- 3) The creation of outreach ("package") materials for project solicitation. These materials (written in Spanish) are to be used by ESPOL and WPI faculty and administrators to solicit project opportunities for WPI students at off campus agencies. Several groups in both Quito and Guayaquil have been targeted for the next project center operation.

Objective #2 - Establishing a WPI Project Center in Ecuador

The primary accomplishments during this year are the six completed student projects:

- 1) **Urban Air Pollution Improvement in Guayaquil, Ecuador** conducted by: Fedrico C. Medina Steve Roix Dawn Varacchi
- 2) **Secondary Trans Ecuadorian Oil Pipeline** conducted by: Lonn Beaudin and Leila Carvajal
- 3) **Urban Waste Management in Guayaquil, Ecuador** conducted by: A. Concepcion, F. Pereyo, and O. Plante.
- 4) **Pollution Generated by Productive Activities** conducted by: A. Burns, L. Guillette, N. Rajashekar, and R. Soriano.
- 5) **Resource Management for Sustainable Development** conducted by: T. DiNoia, S. Joseph, E. Mendez, and V. Mosier.
- 6) **Mine Tailings in Ecuador** conducted by: J. Croft, K. DiPietro, R. Johnson, J. Pedro, and K. Worden.

Objective #3 - Faculty Development

Three main accomplishments occurred this past year:

- 1) Creation of a manual entitled Participant Training Guidelines (authored by Ms. Lisa Jernberg). The manual describes the process whereby ESPOL junior faculty could successfully apply for graduate study to WPI through this UDLP.
- 2) Execution of a short course/workshop on Entrepreneurship conducted by Prof. Art Gerstenfeld. This workshop was initially intended as Activity #6 and not scheduled until 1995. Due to specific interests from ESPOL, it was moved up one year and conducted during August 1994.

3) ESPOL updated its operational plan. This was required due to a 20% decrease in funding by the GOE.

B. A description of progress toward the completion of each linkage objective

Objective #1 - Planning for WPI Project Center and Faculty Development

Planning seems to be an on-going activity in this UDLP. WPI is dealing with the relationship between faculty and administration. Significant stress, caused mainly by financial pressures is the underlying reason for this dysfunctional behavior. Similarly, ESPOL has been suffering financial pressures as well and this is reflected in a down sizing of ESPOL's operational plans. In both cases, the primary result is a general loss of community within each institution.

Objective #2 - Establishment of a WPI Project Center in Ecuador

Recruitment for students for the next years project center are progressing. WPI has changed its format for this years "Global Opportunities Night" which is to be held Friday, November 4, 1994.

Objective #3 - Faculty Development

In terms of on-going issues in Faculty Development, three items will be listed:

- 1) New graduate student applications for degrees in science, technology and management. ESPOL has a practical need to increase scientific and technical expertise in key industries of Ecuador.
- 2) The new career developed at ESPOL in the area of economics and new business development.
- 3) The entrepreneurial workshop was held in August, 1994.
- 4) The continuation of graduate training for Victor Hugo Gonzalez and Edgar Izquierdo.

C. A description of any problems or barriers affecting the progress toward achieving the linkage objectives

Financial stresses at both WPI and ESPOL is the main problem of this UDLP.

In addition, a number of other areas will be noted as problems/barriers:

The original design of the UPI and ESPOL UDLP anticipated a greater degree of interaction between individuals than has actually occurred. The P.I. had designed (nearly to the point of creating a LogFrame) the program to include the ESPOL junior faculty (i.e. UPI graduate students) directly into the pretraining program (PQP) of the UPI students being sent to Ecuador. This has yet to occur as the two ESPOL junior faculty / WPI graduate students have not taken an active part in project center activities. To a large extent, this is because of a change in the upper administration at ESPOL with a concurrent shift in institutional priorities. In addition, WPI's graduate programs are not fully integrated with the undergraduate programs.

ESPOL and WPI have not responded to these issues with institutional restructuring and their relationship to sustaining the WPI/ESPOL linkage.

ESPOL has expressed a need to develop procedures for implementation and assessment of their Strategic Plan and although it might seem natural that ESPOL formally request that WPI join with them in this

effort this has not occurred. The P.I. and Director of Latin American Programs at WPI feels that WPI's experiences here might serve this process significantly.

ESPOL needs to investigate the development of a mechanism to encourage and nurture a tradition of industrial support for higher education and WPI needs to better utilize industrial support for off-campus project centers. This may be a difficult task in Ecuador, as Ecuadorian industry must value educational involvement to a greater extent than currently exists.

ESPOL has a pressing need for the training and retraining of its current faculty. The P.I. (JER) of this UDLP had originally thought that "research" would be a mechanism to stimulate this process. Little sustained progress has resulted in this area, however. Several reasons might exist here including: (1) a general incompatibility of what constitutes "research" at each of the two institutions, (2) a feeling of "being overloaded" by each of the two sets of institutional faculty, (3) a lack of understanding of the needs of the UDLP and the growth of the two institution's infrastructures in capacity building processes, (4) other reasons which have been expressed by WPI and ESPOL faculty and administration.

Dr. J.E. Groccia's believes that ESPOL faculty, in general, are still not clear about the procedures and requirements involved in "project work" as operated at WPI and executed at ESPOL. The long-range goal (or hope) of the PI (JER) is that the program will be able to run exclusively with ESPOL faculty overseeing the project's execution on-site in Ecuador.

While the Linkage project has been successful in bringing WPI students to Ecuador, the need remains to realize the exchange of students (faculty) from ESPOL to WPI. The P.I., (JER) has supplied all the background information relating to this UDLP to all parties. In some cases, there has been a lack of reading the information supplied or a strong desire not to function within the new paradigm created under the UDLP. This problem exists at both institutions, and although many of the specific activities were designed into this UDLP's program aimed to overcome or change institutional traditional patterns, no real change has occurred. Clear reading of the U.S.A.I.D. rules and projected mission statements is needed by all parties.

The project experience needs to be strengthened with a greater degree of accountability and organization. The projects need to be developed to ensure that they are of "substantial" content and advised in a consistent and well-defined manner. This question has been addressed to the ESPOL administration several times in the past year with little or no response returned to the P.I. It is now unclear how to proceed in this very important area and could result in damaging the linkage if not resolved for mutual benefit.

An important need of the ESPOL/WPI UDLP is the development of a carefully designed outcome assessment plan. This is highlighted in UDLP Director, Dr. Frischer's letter dated February 25, 1994, in which she emphasizes the need to develop an objective method to assess attainment of the general goals of this project. Such an endeavor must begin with a careful review of the original grant proposal, a clarification of intended outcomes, identification of behaviors and objective criteria which can be used as measures of goal attainment, development of an assessment plan and schedule, determination of the resources (financial and personnel) to carry out this plan, data collection and analysis, and finally, report and dissemination of the results. Again, the P.I. has transmitted all these documents to all parties from both institutions and to date has not received any feedback on the central issue of leading to sustainability of this UDLP. Additionally, there seems to be a disregard of A.I.D. rules by ESPOL participants. In spite of WPI instructing ESPOL to follow A.I.D. rules, these rules are not being adhered to and this may lead to further delays in developing the linkage to a sustainable level. Most specifically, the ESPOL faculty/WPI graduate students have not kept the Quito mission informants of their activities. There now seems to be a clear and direct violation of A.I.D.'s policy of bringing participant dependents to the U.S. without waiting the appropriate six month period.

A problem of perceived "safety" for WPI students in Ecuador is of concern as well. This is a difficult issue to deal with as it is primarily driven by perceptions and not by facts.

In addition to the specific concerns as discussed in the needs assessment, the P.I. would list the following several items: (1) Funding issues are central to much of the topics leading to sustainability of the linkage. (2) Clear-institutional commitment are needed by both WPI and ESPOL. It is not clear to the P.I. that firm relationships have been established between key researchers in the two institutions. The reasons for this are complex and are probably due to the structures of the institutions and associated organizational behaviors. Until mutual benefits are realized by all involved parties, commitment will be limited. If these two general areas are addressed, all other problems will be solved. To achieve these goals, communications must be clear and open and both institutions must develop keen cultural sensitivities. (3) A need generally for ESPOL and WPI administrations to institutional policies and procedures in support of this UDLP.

D. A description of progress toward ensuring the sustainability of the linkage

In the area of the WPI/ESPOL Project Center, a proposal for sustainability of this Program was approved during the last quarter of this year. The two universities of higher educational WPI and ESPOL have established a working linkage through financial support of the USAID since 1991. These two universities have determined that there is sufficient mutual gain by continuing their linkage. Both universities must gain financially by continuing this linkage.

The two primary objectives of the initial linkage between WPI and ESPOL are:

1. Establishment of a WPI Project Center at ESPOL.
2. Continuous Faculty Development through advanced studies and research for both ESPOL and WPI professors.

This proposal discusses extensions of Objective # 1. Although objective #1 is intended to provide WPI students international experiences, that are acceptable academic credit, this objective is intended also to assist ESPOL professors in their research and professional development used appropriately by ESPOL faculty. WPI students can become a valuable asset to ESPOL faculty. In the long term (sustainable limit) WPI does not intend on sending its own faculty to the Ecuador Project Center. In this sustainable limit WPI students will be directly serving Ecuadorian social needs as identified by ESPOL faculty and other Ecuadorian agencies chosen by ESPOL faculty and Administration

In order for WPI to continuously train qualified students for the project center in Ecuador, two basic criteria must be met by ESPOL.

- A. A critical number of projects must be provided to WPI by ESPOL. This critical number is five projects per year.
- B. Sufficient financial support must be provided by external (to ESPOL) agencies to offset cost of running this program. Both WPI and ESPOL will share in these financial matters. To meet these two criteria the following schedule is proposed.

- I. Each project shall be charged \$ 5000 (or sucres equivalent)

- II. WPI and ESPOL shall share in these revenues via the following matrix.

	WPI	ESPOL
Project # 1	\$ 4,000	\$1,000
Project # 2	\$ 3,000	\$2,000
Project # 3	\$ 2,000	\$3,000
Project # 4	\$ 1,000	\$4,000
Project # 5	\$ 0,000	\$5,000
	\$10,000	\$15,000

This should provide an incentive for ESPOL to secure external support. This schedule of revenue sharing will be in effect for projects occurring in October-December 1995 and for projects to be planned in 1996. Beyond this date, the schedule will be reassessed.

Although projects to date have only involved WPI students, the possibility of ESPOL students working with WPI students could be incorporated as early as FY 1996.

ESPOL is to provide WPI with the projects in a timely manner that will allow time for WPI to select students for the Ecuador Project Center.

ESPOL is to further provide WPI students with adequate housing at a rate not to exceed \$10/student night. This equivalent financial support shall be used to offset the WPI revenue side. Invoice to support this must be sent to WPI two months prior to beginning of student projects in Ecuador Housing for WPI faculty (as need) or project center director should be at a reasonable daily rate as well.

E. A quantitation of outputs of the linkage activities

One up-dating of the ESPOL Strategic and Operational Plans

Six completed WPI student projects involving 21 students, two WPI faculty and nearly a dozen ESPOL faculty/administrators.

Two ESPOL faculty enrolled in WPI's Department of Management.

One completed workshop on entrepreneurship.

F. An assessment of the impact of the linkage on internationalization of the Recipient institution and any U. S. linkage partners

At approximately the same time that this UDLP was awarded, WPI began to see the marketing advantage of a strong international presence. The fall 1989 WPI Journal highlighted off campus opportunities and listed 12 recognized sites. By early 1993, the number of these sites had grown to 19; nearly a 60 percent growth. A greater change is noted in "project center" growth. [A project center differs from other sites in that a resident WPI faculty member is on site with WPI students during their project execution.] From 1989 to 1993 the number of project centers grew by 300%

Institutional behavioral change is noted in many other non-academic departments. Admissions has altered not only where it recruits WPI students, but also the financial aid policies to attract high quality scholars, increasing the diversity of student body and maintaining the educational standards of the institute. The Ecuador program, established by UDLP funding, was highlighted in both WPI Journals of 1993. Data from the registrar indicates that since 1988 underrepresented minorities have more than doubled (on a percentage basis) and given a total expansion in the undergraduate population this represents a significant increase in the number of students. It is now not uncommon to hear many languages other than English to be spoken on WPI's campus.

Some offices at WPI were unprepared to anticipate the impact of the globalization effort and the historical data from admissions department does not clearly question student applicants on topics related to WPI's overseas programs, thus no quantitative data is available here. However, an external survey (Barton Gillet) indicated a need for WPI to attract nontraditional students who can more easily assimilate into the global economy of the future.

Given these tough fiscal times, it must be added that these expansions in programs have occurred without causing significant additional costs to the institutes functioning.

Assistant Provost for Academic Initiatives, Lance Schachterle, wrote separately on the issue of sustainability and lists four specific points on institutional impact: greater numbers of students involved in program, a need to move beyond ESPOL in project offerings, further expansion in faculty professional development both formally at WPI and at ESPOL. Overall his assessment is also quite positive. An additional item to note is that the annual IQP Awards given by the President of WPI to the best student projects has steadily shifted from exclusive U.S. student projects to projects performed at foreign institutions. In 1993, one of the bootstrap team projects was selected as finalist in this stiff competition.

To summarize, the impact of this UDLP on WPI's organizations culture and operations has been both positive and desirable.

WPI has had an international component within its interdisciplinary studies division for nearly twenty years, but until the cooperative agreement was established with ESPOL, none of these programs were within a developing country. This is the most significant impact that this UDLP has had on WPI campus character. For the first time in WPI's history, students and faculty are provided a forum to witness development. Moreover, this linkage has established a foothold for WPI in Latin America.

G. An assessment of the impact of the linkage on strengthening each developing country linkage partner institution's capabilities to meet its societal development needs

New academic programs were developed at ESPOL. These include Economics and Entrepreneurship which is an undergraduate four year that first enrolled students in the May, 1994. The first class had 240 students enrolled. This UDLP contributed to the program's development. The graduate programs of both Victor Hugo Gonzalez and Edgar Izquierdo are targeted to allow them entry as contributing faculty in this program. In addition, the Workshop on Entrepreneurship contributed directly to this program's advancement.

Local external influences from the Ecuadorian society requested ESPOL develop this program. Influences from ESPOL alumni was central here. Additionally, new business development programs were needed and a recognition of an emerging global economy contributed to this program identification.

Several new careers are in various stages of planning and may benefit from this UDLP. These include:

1. Biotechnology
2. Environmental Engineering
3. Marketing
4. Food Engineering
5. Public Administration

Diplomatos (one semester programs are offered at ESPOL and may benefit as well.

Research programs of ESPOL faculty has lead to community outreach efforts. This was the case of the WPI projects in "Urban Waste Management in Guayaquil, Ecuador", "Pollution Generated by Productive Activities", "Sustainable Development for Community Planning ", "Urban Transportation Pollution in Guayaquil, Ecuador", "Environmental Impact of a New Oil Pipeline in Ecuador", and several others.