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Evaluation of the  
DEVELOPMENT PLANNING STUDIES PROJECT  
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## I. Introduction

This evaluation was conducted by three U.S. Government personnel in Egypt over the months of December 1982 and January 1983 (Messrs. R. Mitchell and W. Charleson of USAID and T. Vrebalovich of the U.S. Embassy). It was undertaken in compliance with Project Paper requirements and in the light of a Cairo University (CU)/Massachusetts Institute of Technology (MIT) draft proposal received on November 25, 1982 for extending the Project Assistance Completion Date (PACD) from November 1983 to July 1986 and adding an additional \$14,000,000. The project was originally funded in 1978 and thoroughly evaluated by an external team in 1980. The current evaluation, therefore, has concentrated on: (1) what has (or has not) occurred since 1980 in terms of the recommendations of the 1980 evaluation which were subsequently made part of the Project Amendment of 1980, and (2) what remains to be done.

In discussions with the Project Officer and USAID/C Evaluation Officer, it was agreed that the current evaluation would not follow the standard AID format; i.e., tracking inputs to outputs, outputs to purpose and purpose to goal using the log frame as the point of departure. For reasons of limitations in time and staff, it was agreed that the evaluation team should:

- (1) Posit three critical aspects of an "end state" for the Development Research and Technology Planning Center (DRTPC) of Cairo University which is the Egyptian counterpart organization to MIT;
- (2) Examine CU/MIT progress to achieving the "end state" (i.e., a center capable of continuing the purpose of the Project without USAID direct Project resources); and
- (3) Recommend changes in Project activities when it could be demonstrated that their adoption would increase the likelihood of achieving the desired institutional "end state".

The three critical aspects examined are:

- (1) Financial viability; i.e., the extent to which the DRTPC could reasonably expect to obtain enough income from clients (GOE Ministries, UN, other bilateral donors and AID) to meet DRTPC direct and indirect operating costs over time;
- (2) The nature of the DRTPC's likely clients and the extent to which they would be willing and able to pay for direct research and overhead costs; and
- (3) The administrative and organizational capacity of the DRTPC to manage a growing research center that would provide a variety of services by itself.

The need to posit an "end state" was necessitated by the fact that none of the Project documents provide enough precision vis a vis "end state" to permit its use.

In short, while the evaluation seeks to clarify how much has been accomplished since 1980, it gives more weight to looking at how far key efforts must go before the purpose has been achieved or is likely to be achieved.

The Project's purpose remains valid.

"Create a permanent institutional framework through which Egyptian applied research and training capabilities can be organized so as to strengthen the capacity of GOE Ministries to carry out development and project planning activities."

What has changed is the date for achieving the purpose. In the light of a two year managerial hiatus which thwarted implementation, CU and MIT began, in early 1982, to prepare a proposal to extend the PACD by a like amount of time and add additional funds. It is reasonably clear that USAID/C concurred in the possible need for revisions and in no way discouraged the development

of the unsolicited proposal recently received. The evaluation team, therefore, has not used the PACD of the current Project (i.e., November 1983), but has considered the terminal date to be beyond that date.

The evaluation team is satisfied that full institutional viability of the DRTPC's three activities (administrative, training and research) will not be achieved by the current PACD, November 1983. July 1986, the proposed new PACD, is accepted only for analytical purposes. To the extent that the evaluation reveals that all or part of the purpose can be achieved before July 1986, the shorter duration is presented in the evaluation. In short, the evaluation team proceeded on the assumption that achievement of purpose remained the primary objective of USAID/C and the Government of Egypt and that, consequently, the duration of the Project and the funding of it should be dictated primarily by that objective.

The conclusions and recommendations which follow in Sections III, IV and V are related to the aforementioned two analytical optics: i.e., (1) how far the Project has come since 1980 and (2) how far it has to go.

## II. Project Background

Beginning in 1973, as a result of substantial political and social transformation, the GOE assumed an increased responsibility to plan and execute programs that would contribute to its national development. The commitment to substantial, long-term economic assistance from the U.S. and other external sources brought major pressure on Egyptian Ministries responsible for these programs. Early contacts between U.S. and Egyptian cabinet members within the framework of Joint Working Groups identified limited capabilities in project design, analysis and implementation as a major obstacle to providing development assistance to Egypt.

Protracted discuss within the Joint Working Groups, particularly those concerned with Science and Technology, and Education, led to a decision to involve Egyptian and American academic institutions in a program to address development planning problems. Cairo University and the Massachusetts Institute of Technology were selected. In December 1976, AID contracted with MIT to establish a pilot collaborative research effort with CU and various interested GOE Ministries to improve their capabilities first to identify and analyze critical Egyptian development problems, and then to design and manage either remedial or new projects and activities. Simultaneously, the feasibility of institutionalizing the process of collaboration among Egyptian academics and government officials was to be examined. The success of the initial program contract led to a full scale PROAG and contract which the GOE and MIT, respectively, signed in August 1978, with the aim of continuing the collaborative research process and establishing a permanent, autonomous center at CU capable of independently carrying out research and education efforts relevant to the development objectives of the GOE.

Under the terms of the Project/Contract, joint collaborative research involving CU/MIT and interested "end-user" ministries proceeded. As the initial step in developing the desired permanent institutional framework, the Development Research and Technological Planning Center (DRTPC) was chartered as an autonomous research unit within Cairo University in March of 1979. The first director (former Minister, Ali al-Salmy) was appointed, a set of bylaws was enacted, and over 2,500 square meters of space was provided by Cairo University in a new building on the university campus.

An independent project evaluation conducted in late spring 1980 expressed satisfaction that the collaborative research activities and processes established and pursued during the first phase of the Project were making good progress. However, the evaluation report recognized the fact that progress toward institutionalization of the DRTPC had lagged significantly. In negotiations for a Project amendment and extension in the summer of 1980, institutionalization was the major point of contention. The amended contract

with MIT, signed late September 1980, provided that a specific organizational plan for accomplishing institutionalization of the DRTPC would be developed and provided within six months of the outset of the second phase of the Project.

Differences of opinion between the DRTPC Director and the joint CU/MIT project management concerning both the management and the programmatic nature of DRTPC activities contributed largely to delays in the desired institutionalization process, both before and after the initiation of Phase II. On the management side, the planned, gradual amalgamation of the administrative staffs of the DRTPC and of the MIT Project Liaison Office was not effected. Systems remained separate and diverse in approach and in practice. As regards research, the DRTPC Director embarked upon and pursued an ambitious program of research in a wide range of areas, and drifted away from the strong science and technology based research areas where the comparative advantage had been developed by the CU/MIT program.

The term of the DRTPC Director's appointment expired in February 1981, and Dr. Hassan Hamdi, President of Cairo University and Chairman of the DRTPC Board of Directors, did not renew the appointment. In March 1981, after a joint evaluation of the Center's progress conducted by the Cairo University Executive Committee and the MIT Policy Committee of the Project, a major reorganization was undertaken. The decision was made to postpone appointment of a new DRTPC Director, and the Cairo University Executive Committee took a more direct role in shaping the specific scope for the Center's activities and administrative development. This management hiatus, during which the Committee managed the Center, caused further delay in the overall institutionalization process. However, during that period a set of guidelines was established for the Center's research and educational objectives, and for its administrative development.

In April 1982, a new Director of the Director of the DRTPC was appointed. Plans for a revised organizational structure were formulated and implementation steps initiated by the new Director in collaboration with, and assisted by MIT. In view of the delay in institutionalizing the Center, and

given prospects for progress following the reassessment and reorganization, the Joint CU/MIT Executive Committees decided to propose to USAID an extension of the Program to accommodate a third, "institutional" phase. A final draft of this proposal was received by USAID/C November 25, 1982.

### III. Overall Conclusion and Recommendation

Before offering specific conclusions and recommendations, the evaluation team felt compelled to provide a summary, overall conclusion and recommendation. Both are suggested by the importance of the project in the light of AID's desire to further the transfer and/or adaptation of science and technology to the developmental needs of Egypt and the fact that USAID/C has been asked to provide CU/MIT with a statement of intent regarding the possibility of extending the PACD and adding funds. The facts evidence that much has been accomplished under the Project, particularly in the research area (Appendix IV provides a list of research projects). Discussions with Egyptians consulted (Appendix V) confirm their sense of accomplishment and commitment to achieving the Project's purpose.

The development and acceptance of interdisciplinary research where it did not adequately exist before, the linking of Egypt's research capacity in universities to the needs of GOE Ministries/Agencies, the development of commitments to the application of knowledge (as opposed to the traditional theoretical pursuits of Egyptian academics) and the commitments of senior DRTPC staff to "hang in" when the DRTPC lacked full time leadership attest to considerable achievements which are not easily obtainable in any university. The evaluation team believes that starts in all these areas have been made, but that institutionalization of them in perpetuity will require additional investments and extensions of the project.

More than an extension in time and additional funds are required, however, if anything lasting is to be accomplished. The evaluation team believes that the Project's efforts to date have emphasized research at the expense of institutionalization; that development of an organization has been

viewed as a surrogate for the development of viable institutional capacity. The evaluation team believes that there is still some confusion among parties to the Project concerning the purpose of the Project and a mutually agreed upon "end-of-Project status", as noted in the 1980 evaluation. The recently received CU/MIT proposal offers the following purpose statement:

"To cooperate through a collaborative use of expertise from MIT, Cairo University personnel, and personnel from development oriented ministries to strengthen Egypt's planning, analysis and project development processes. To assist in the institutionalization of the Development Research and Technological Planning Center (DRTPC) at Cairo University to create a permanent framework for this effort."

What is being proposed appears to shift the emphasis of Project effort from GOE Ministries to the DRTPC; i.e. in the 1977 and 1980 statement of purpose (from PPs), emphasis is given "... to strengthen the capacity of GOE Ministries ...", while the recently received proposal offers the DRTPC as the main focus of Project activities. In the view of the evaluation team, purposes and "end-of-project status" should be carefully reviewed. The team believes that institutionalization requires the planned participation of all parties and that consideration of clients (the demand side) warrants more attention relative to the supply side (i.e., DRTPC) than it has received, particularly in the light of the need for obtaining greater revenues from clients to support the DRTPC's activities.

Overall Conclusion: In the light of managerial hiatus (beyond Project control) and despite shortcomings, particularly in planning for institutionalization of the DRTPC, the Project's efforts, particularly in research, warrant continuation of Project activities for a duration and at a level of effort commensurate with carrying out the following recommendations.

Overall Recommendation: Should USAID/C entertain a proposal from CU/MIT for the extension of the Project and for additional funds, the proposal, and any scopes of work derived from it, must clearly specify how the project will deal with the recommendations given hereafter in Sections IV and V. (1)

IV. Achieving Institutional Viability During the Remainder of the Project. (i.e., betw .n January 1983 and the proposed terminal date for Project . activities, circa 1986)

This section reports the current evaluation team's conclusions and recommendations regarding the likelihood of the DRTPC achieving self-sufficient institutional viability by 1986. Three different but related perspectives are taken: (1) fiscal status (Charleson); (2) the market for DRTPC services and the organization of CU and the DRTPC research resources (Mitchell); and (3) DRTPC training and consultancy development (Vrebalovich).

1. Fiscal Viability

It is clear that fiscal support for the DRTPC's activities, until recently, came entirely from the CU/MIT Project which met all direct and indirect costs. It is equally clear that institutional viability in the future is, among other things, contingent upon the ability of the DRTPC to provide the kind and quality of services (e.g., research, computer facilities and training) that clients (e.g., GOE Ministries) want and are willing to pay for.

This is not to say that income must equal or exceed direct and indirect operating costs within the time limit of the Project, but

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- (1) Recommendations have been keyed with respect to when they should be acted upon:
- \* - the recommendation should be acted upon immediately and should be a condition precedent to any extensions and/or contracts.
  - \*\* - must be accomplished for consideration of any amendment and/or contract revisions.
  - \*\*\* - should be commenced now with clear plans for finalization within six months after the commencement of any extension.

rather to point out that, in the opinion of the evaluation team, there must be clear evidence that dependency upon USAID is being substantially and clearly reduced and that this reduction is being increasingly off-set by other funding sources. The proposal recently received projects a relative reduction of Project resources over the proposed balance of the Project as well as a shift from research to institutional development components.

To gain insight into the rate and direction of the DRTPC's fiscal self-sufficiency, the evaluation team requested DRTPC to provide fiscal data showing the difference between costs and income for the period 1982/3 - 1986/7. At the same time, the evaluation team developed its own methodology, but used CU/MIT proposal base year figures (i.e., costs in 1982/3). In discussions with DRTPC/MIT staff, it became clear that, while the evaluation team and DRTPC/MIT were both working to calculate the volume of research/services required to assure that revenues would equal costs, approaches differed markedly on how to calculate "core" costs and, of course, subsequently the volume of research/services needed to cover them. DRTPC commenced by assuming that the DRTPC was planned to be a center with an annual research volume of between L.E. 3,000,000. and L.E. 3,500,000. Two analysis cases were prepared by DRTPC/MIT. The first (Appendix I) assumes that total indirect costs remain constant; that allocated direct costs are escalated and the ratio of fixed costs to variable costs would remain constant (i.e., fixed costs would remain at 82% of variable costs). The second analysis (Appendix II) posits that the ratio of allocated direct costs to direct costs is constant and that indirect costs are variable. The evaluation team's approach (Appendix III) attempted to identify "core costs" (i.e., fixed costs to cover minimum operational presence such as the Center's Director, accounting staff, computer operator, basic books and journals) and known income (e.g., from the Project and current outside research) and project them until 1986/7. The gap between projected income and core costs was projected and the volume of

research/services calculated (at 30% overhead) which would be necessary to meet the projected gap. Research and services were taken to involve variable costs which would be met from research/service contracts plus an overhead fee (30%) sufficient to cover core costs. Research costs were assumed to be variable. While there was no important difference between DRTPC and the evaluation team regarding what constituted core costs, it became clear that 1982/3 proposal base line figures for such costs included both fixed and variable costs, because the Center is currently providing research/services. Base line figures for 1982/3, consequently, reflect both types of costs. The evaluation team decided that the differences in methodological approach for calculating necessary research/service volume to break even were not as significant as the fact that all approaches signaled the need for substantial increases in research/service volume and that the recently received CU/MIT proposal provided no strategy showing how Center activities and resources would be deployed over the next three years to close the gap (i.e., reach the break-even point). Case 1 shows that a sixteen fold increase will be necessary (i.e., from current volume of LE 200,000 to LE 3,200,000 by 1986/87). Case 2 shows a nineteen fold increase (i.e., to LE 3,800,000) and the evaluation team's approach showed a twenty-one fold increase for the same period (i.e., to LE 4,200,000.) In the opinion of the evaluation team the increments reflected by differences in method are relatively insignificant compared to the fact that under the least severe estimate there still must be a sixteen fold increase in research/service volume in approximately three years.

The evaluation team has noted that neither Progress Reports nor the Draft Proposal for the Institutional Phase of the Project (1983-86) deal adequately with the funding problem. In the proposal, for example, only salaries are inflated, there are no reserves for depreciation, no non-research computer income is shown, no plans are given for how the DRTPC will handle credit

balances in its end-of-year accounts. While any one of these items may have only a marginal impact on the problem of fiscal viability, in the aggregate they may be very important. Most importantly, perhaps, the relationship of income to costs is not spelled out in reports or proposals, nor are plans specified for how the Center will reach the break-even point.

A. Conclusion: On the basis of existing cost and income forecasts, the DRTPC will face formidable funding problems beginning in 1985/6, rising rapidly in 1986/7 and thereafter and little has been done to systematically identify the problem or plan for its solution, within the context of a 3-year operational plan.

B. Recommendation 1: The DRTPC should develop a three-year operational plan in collaboration with MIT. The operational plan should provide: (1) an end-of-project status for each of the DRTPC's activity areas (e.g., research, instruction); (2) current status for each activity area; (3) clear strategies for progressing from current status to desired end-of-project status; and (4) specification of how the DRTPC's resources (i.e., GOE and USAID Project; human and fiscal) will be used to obtain desired end-of-project status.(\*)

Recommendation 2: A clear and concise plan must be developed as part of the operational plan to deal with the problem of fiscal viability. This plan must, at minimum, deal with the following:(\*)

- i. The size of the core facility and its relation to fixed and variable costs; i.e., to what extent can the core be reduced without prejudicing research and service quality?
- ii. The relationship of indirect costs to total costs and the possibility of reducing over time the indirect costs levied by CU so that an increasing portion of such costs are absorbed by CU (as they often appear to be in other research centers at CU).

- iii. The relationship of existing research selection criteria to income. At the present time, DRTPC does not have research contracts with housing and construction, and research in support of private sector initiatives is fledgling at best. An income policy which essentially relies on generating a large and continuing amount of research for a few select clients (already on-board) should be compared to a policy which would cast the client/research net more broadly. In looking at this problem, the DRTPC should carefully consider what must be done to encourage potential clients to get involved with the DRTPC members. Should CU and particularly MIT become brokers (i.e., hiring competent staff from outside their respective faculties) when it is demonstrated that the nature of client demand can only be met by doing so?

Recommendation 3: The DRTPC's overhead rate or rates must be carefully determined.(\*\*\*) There is every reason to believe that the 109% rate on salaries currently paid to CU by the Project may be too high and a 30% rate on total costs too low, or they may be equal. The point is that neither have been empirically derived. Certainly U.S. consulting firms and universities charge considerably more than 30%. While the evaluation team understands that the setting of empirically derived overhead rates is difficult, it must be done if the DRTPC is to have any justifiable grounds for its overhead rates. This issue should be addressed immediately and USAID should not entertain any proposals for extension that do not systematically spell out how parties to the Project intend to deal with the problem, and how the problem relates to other cost/income variables.

Recommendation 4: Because the fiscal viability of the DRTPC is critical to its survival, the long range (e.g., three year plan) should provide for specific interim (e.g., one year) measures for assessing status (e.g., fiscal, client, administrative). These annual reviews should be in-house and should include staff from USAID/C, DRTPC and MIT.

## 2. The Market for DRTPC Services

The Center reports that it has become increasingly successful in obtaining research contracts relating to transportation, physical planning, and water resources. CU/MIT has had only limited success in penetrating the Egyptian economy's three largest sectors: construction, industry, and agriculture. (It was not expected to be able to provide significant research services to agriculture.) Considerable resources have been put into the non-responsive construction sector, and it seems that the CU/MIT has had problems in controlling the costs and managing the research activities in the sector, one of the largest in the Egyptian economy. Because the DRTPC anticipates narrowing its focus to applied S&T research concerns, this lack of marketing success suggests a possible misalignment between the demand for and supply of research services the DRTPC is able to offer.

This possible misalignment partially reflects the recognition that selected public agencies have given to successful CU/MIT projects and the quality of the CU academic research staff. However, it seems that the research in the construction area has been of high quality and has significant implications for development. Therefore, differences in the institutionalization of demand mechanisms for applied academic research cannot be explained (only) by the quality of the research performed to date. Instead, it appears that sectors differ in how they are organized, and these differences in turn affect:

- (1) the receptivity of and demand for applied research;
- (2) the use of this research so that its value can be demonstrated and in turn converted on a sustaining basis into a demand for additional research; and
- (3) the strategies DRTPC should evolve to market its research and training services.

The marketing of research services in the future should recognize differences in the way the markets in different sectors are structured. In the Ministry of Transportation and in the General Organization for Physical Planning, for example, it appears that the R&D/special studies function is fairly clearly centralized in particular offices that have funds for research and a leadership that has responded to the resources of the DRTPC. In contrast, the R & D/special studies function is widely diffused throughout the construction and industry sectors (as it is in the U.S. and in many other countries). Egyptian industrial firms do not have specific R&D offices. DRTPC research and service in industrial firms have been overseen by ad hoc liaison groups. There are no organizational mechanisms to continue the research, and there are no mechanisms to help activate a firm's R&D interests. The construction sector is similarly organized. Neither the Ministry of Industry and Mineral Wealth nor the Ministry of Housing have offices with funds to encourage research. Although individual firms may have funds, the firms are not presently organized in ways to involve universities on a continuing basis in solving firm-level or sector problems. Special research institutes have been created in both sectors (a Building Research Center and the Tabbin Metallurgical Research Institute), but these organizations suffer the same difficulties noted here for DRTPC.

DRTPC cannot be expected to effect basic changes in these sectors, but their economic significance, combined with their importance to a university research center with close linkages to a faculty of engineering, suggests that DRTPC/MIT should adjust its marketing strategies to recognize the peculiar structural features of different sectors. As will be noted later, a more deliberate coordination with other AID-funded projects may help develop the market for DRTPC services in the industry and construction sectors.

A. Conclusion: The market for DRTPC services is not homogeneous with respect to organization, willingness to undertake research, or in terms of capacity to do so.

B. Recommendation 1: CU/MIT should prepare program-selection criteria for USAID-funded activities reflecting market/client considerations.\*\* The DRTPC has been successful in obtaining grants in several sectors that have centralized research offices, and it appears that the market in these sectors will continue to grow. There will be no shortage of "good" projects in the

sectors, but the Project itself should not be the sole basis on which decisions are made to involve AID-funded research and training activities, particularly in the light of the DRTPC's funding problem. Existing CU/MIT projects in these sectors should continue to be allowed to terminate. (This recommendation does not, of course, refer to DRTPC research arranged independently of MIT.) New CU/MIT activities should be limited to those sectors where the least progress has been made in institutionalizing the demand for DRTPC services.

These sectors (perhaps especially industry) seem the most likely sources for significantly expanding the DRTPC's funded research activities at a level that will help cover the overhead expenses being assumed by the Center. That is, the Center's marketing strategy might more appropriately look to opening new markets rather than to increase its share of existing markets. Its share of existing markets will be limited in part by the faculty resources on which the Center can draw. There is no evidence that the University will add new faculty with the skills that will allow a significant expansion in fields where institutional linkages have already been successfully established.

Recommendation 2: DRTPC should prepare a specific marketing and institutional development strategy directed to the high priority sectors. (\*\*\*)  
It may be especially important for DRTPC to build on the prestige MIT brings to the Project in working directly with Ministries and end-users on research and training activities and to help effect structural changes that will help encourage a self-sustaining demand for DRTPC research services. Furthermore, it is recommended that closer coordination and targeting be considered for existing activities, including the "new initiatives". These might include targeting a "critical mass" of internships, short-term research projects, fellowships and research seed-funds on particularly promising individual sub-sectors or firms. As will be noted later, this marketing strategy would also benefit from MIT involvement with the firm/sub-sector in jointly preparing scopes of work, assessing progress and results, and assisting in follow-on research and marketing activities. This strategy may occasion a different mix of CU/MIT resources, a revised level of effort and may also impact the PACD.

### 3. The Center's Mobilization of Faculty

Faculties and departments within CU differ in the proportion of their professors who are engaged in development or other activities either outside or within the University. In architecture and civil engineering, it is reported that a high proportion of faculty members have outside well-paying activities. There is relatively little economic incentive for these faculty to become involved in applied academic research through the DRTPC. However, a number of leading members in these departments have been involved in the CU/MIT Project in the past. This suggests that there are means to solicit faculty involvement in departments where there would appear to be economic disincentives for academic research.

Estimates vary on the proportion of faculty with outside research and economic activities within other departments in the engineering faculty. It is also not known how many faculty members could benefit from and contribute to the DRTPC's program. In fact, DRTPC does not appear to have good information on the University faculty resources potentially available to it. This means that potential users of these services are similarly without this information.

Not all professional staff within the University community nor within Ministries are aware of the services available from the DRTPC nor do they know they may tap into them.

#### B. RECOMMENDATIONS

Recommendation 1: DRTPC should conduct a survey of potential faculty resources available at CU to the DRTPC in targeted sectors. (\*\*\*) This survey should also explore what is needed to obtain the kind of faculty involvement and performance consistent with the quality standards established by the DRTPC and client needs.

Recommendation 2: The DRTPC should prepare a brochure describing for the market and for the faculty the resources, services, and contracting procedures of the Center. (\*\*\*)

The Project reports that a large number of faculty and students have participated in and benefited from the CU/MIT program. However, very few faculty members responded to the most recent advertising for internships and fellowships, and a very high proportion of all the participants are drawn from the engineering faculty only. Several reasons for this poor response have been suggested (e.g., the lack of cooperation on the part of other faculties; better funded alternate fellowship programs: e.g., Peace Fellows). A fellowship coordinator has been appointed to work on this matter.

It appears that senior faculty who apply for the internships are expected to identify and arrange for their own placements and assignments. The Project only provides funds. The fellowship program may follow the same pattern. That is, the Project is essentially in a reactive mode; it serves as a foundation disbursing grant awards to faculty who submit "good" proposals.

The proposed activities, however, are not targeted by sector; there is little if any effort to link projects in ways to support one another or the thrust of the Center (much less attract new clients); and DRTPC apparently has little follow-up with the proposed clients of the funded research and internship services. The project-identification, research, and follow-on marketing process seems to be incomplete and truncated. It appears that some faculty members working by themselves in relative isolation are not able to obtain the results the the Project of their funded activities.

A faculty coordinator is not going to solve this problem. A more deliberate development/marketing strategy is needed. It should cover targeting, placement, research assignments, and follow-on activities. In addition, the Project should offer for faculty members training in how to become successful research consultants in their specialized sectors, where this is appropriate.

#### 4. Organized Research Within CU

The DRTPC is only one of a number of organized research activities within Egyptian higher education and within CU in particular. Neither research nor research centers are new phenomena in Egyptian Universities; and, furthermore, there seem to be a number of "joint research projects" involving the Universities with Ministries and other countries. These projects and centers provide a possible standard for assessing the degree to which the DRTPC has been "institutionalized", the possible ways that different research and research-support functions can be handled, the capacity of the centers and the University to perform certain functions for which MIT now has responsibility, levels and kinds of support Universities provide centers, the services for which outside clients pay (including overhead), and how faculty compensation is handled for the research projects operated through these centers.

Unfortunately, the evaluation team was unable to obtain information on the above topics, but sufficient information was collected to support the conclusion that DRTPC submit further information and analysis in its current proposal to AID for continuing support of the Project.

CU and other universities have their own research budgets. Each faculty has its board for research and a vice dean responsible for research activities. Individual faculty members submit their research requests annually, which are consolidated as they move upward in the University hierarchy for subsequent submission through channels to the Ministry of Finance. The research budget provided the University is then allocated down the University ladder to the individual faculty who made the initial submissions. It is assumed that decisions are made along the way regarding funding levels and areas of relatively high priority. Government presumably does not provide funds at the requested levels and, therefore, the University must apply some criteria and decision-making rules in determining the allocation of limited research resources. There is likely to be some flexibility in this system to permit University authorities to provide more support to certain areas than to others.

An unknown proportion of this research is conducted by individual faculty members; it is not "organized" research in the sense that it is part of a research center's portfolio of activities.

Universities have other resources available to support organized research activities. CU and the University of Alexandria, for example, have "higher institutes". Alexandria's two institutes focus on medical and public health concerns; CU has institutes concerned with statistics, African studies, tumours, etc. The institutes have training and service functions; they are budgeted in a manner similar to faculties; and it seems that some of the budget is used for faculty research.

In addition to higher institutes, Universities have centers. CU has 17 centers dealing with such varied topics as Islamic Studies, mass communications, kidney diseases, computer services, etc. At Ain Shams there are centers that deal with toxicology, teaching science, Middle East studies, etc. The centers differ in their organizational locus. At CU, some centers are under the Dean of the College of Medicine; most others are under the Vice President for Graduate Studies. The DRTPC, a multi-faculty inter-disciplinary center, is directly under the Rector of the University. Each center has its own advisory board.

CU expects its centers to be self-supporting with regard to their research and service activities. It is reported that CU subsidizes the establishment of the centers, but the centers are to generate their own outside research and service grants and contracts.

Again, our information is inadequate, but it appears the CU continues to pay for the support or overhead needs of the centers. These include physical space, utilities and maintenance, secretarial and other staff support salaries, etc. Not all centers receive the same level of support. Some of the decisions on this support are perhaps made by the assistant deans for research who serve on a university-wide research committee under the chairmanship of the Vice President for Graduate Studies. It is reported that decisions on funding levels are influenced by the persuasiveness of individual center directors.

This preliminary information tentatively suggests that CU has discretionary funds to support both research and overhead costs associated with organized research centers. Not all centers are treated equally; some receive more University overhead support than others. DRTPC is perhaps unusual in a number of respects, one of which is its organizational locus in the Rector's office. But it is not unusual in marketing its services outside the University and in providing various support services for its contract research.

A. Conclusion: Cairo University has a sizeable number of research units many of which obtain budgetary overhead support from the University; the DRTPC is not one of them.

B. Recommendation: To facilitate and to help plan for the long-term institutionalization of the DRTPC, DRTPC should investigate and consider the organization, funding, University support, and activities of other organized research and service centers within the University. (\*\*\*) In addition to the items mentioned above, this information and analyses should consider the following topics:

i. Size of center staff, number and organization of center functions, and charges for center services: The DRTPC has six support functions (library, reports and publications, computer, administration, public relations, and finance), and a large (63 are anticipated) non-research support staff. To some extent, other centers must handle similar functions. The strengths and weaknesses of solutions adopted to date should be examined in order to determine whether the DRTPC development strategy is administratively necessary or financially feasible within the context of CU.

ii. Management responsibilities and performance: Responsibility for local project administration has been transferred to the DRTPC. MIT, however, retains certain contractual responsibility for the local currency account. It appears that the other 16 CU Centers have both administrative and fiscal responsibility for their activities. The experiences of these other centers provide some basis for judging what functions the University is fully capable

of handling in a manner satisfactory to their clients, outside donors, and the University itself. This is especially important for MIT, as it apparently has a blanket policy against participating in host-country contracts, a policy in opposition to AID's own policies and intentions regarding institutionalization and capacity-building. (AID's disbursement procedures today seem to address fears contractors might have regarding timely payment. CU has assigned the DRTPC the responsibility of reviewing and approving vouchers, rather than having this done by the University's own financial office. The Center also performs this function under another separate host-country contract with AID.) An analysis of how other centers handle these functions should help answer questions about the administrative and financial implications of different AID procurement procedures, as well as implications associated with the organizational development strategy of the DRTPC more generally.

iii. CU contributions to Center overhead: It appears that the DRTPC is expected to be fully self-supporting. It is to generate sufficient funded activities to pay for its own overhead. AID currently pays CU overhead, which in turn the University uses to provide selected support services to the Center. Other support services are paid out of the project. It appears, however, that other centers have a continuing claim on University resources to cover their overhead. Centers are expected to generate research and service revenues, not revenues to pay for all of the centers' overhead expenses.

The present evaluation report noted earlier that the DRTPC must generate a very large amount of funded research and services in order to cover its overhead. This level of funding may be unrealistically high; it implies that: (i) the Center may have to cut back its large support and varied services, and/or (ii) it must receive some of the same overhead support CU now provides other centers. It is not possible to make judgments on these options and the long-term sustainability of the DRTPC until more information is provided on University and outside support for the other 16 centers.

iv. Extra compensation for faculty: AID, other donors, and Egyptian agencies themselves have discovered that it is customary practice (regulated by Egyptian law) for Egyptian civil servants and faculty members to receive

extra compensation for participating in "new" activities not specifically included in their job responsibilities. AID has a policy against paying civil servants extra compensation for work their government is already paying them to perform. USAID/Cairo and the GOE are now handling this compensation payments from the CIP-generated "Special Account." The payments are not to be paid from Project funds. Government's approval of the use of these funds is one measure of the demand for and value of the services an AID-funded project provides. It also represents another step toward institutionalizing the Project. The CU/MIT Project was initiated prior to the creation of the Special Account. The Account, however, is now available to the Project.

No information is available on how other centers within the University handle the compensation issue and provide funds for these payments. It is also not known whether DRTPC extra compensation levels are higher, lower, or the same as those for faculty involved in projects funded under other bilateral auspices. Because payment levels have significant implications for faculty involvement in the Center and, therefore, the sustainability of the Center, and because these compensation payments could be shifted from AID Project funding to the Egyptian-controlled Special Account, more information should be provided on how other centers handle extra compensation payments to the faculty and staff.

##### 5. AID PROGRAM ISSUES

The Development Planning Studies Project was one of AID's first and now oldest activities in Egypt. Since the inception of CU/MIT, AID has added a number of related projects, and it has also defined more clearly various program goals for these projects. Several different projects are to contribute to improving industrial productivity, to facilitating the transfer of technology, and to mobilizing Egyptian S&T talent to work on problems of national development. Relevant other projects include Peace Fellows, University Linkages, and Industrial Technology Application. The first two are in HRDC/EDU; the other, together with additional S&T activities, is in HRDC/S&T.

CU/MIT obviously is not intended nor able by itself to achieve the numerous relevant program goals AID has defined in these areas over the past several years. More can be achieved, however, by more closely coordinating related activities in different projects. For example, ITA (263-0090.3) will have an industrial extension service that will visit a large number of industrial firms to assist them in solving their problems, some of which will be candidates for DRTPC research. ITA also will draw on university faculty for short-term consulting assignments, and this project would benefit from CU assistance in encouraging industrial firms to create R&D mechanisms. These mechanisms in turn would help institutionalize the demand for CU research and training services.

Some examples of potential inconsistencies among projects appear to have emerged already. For example, CU/MIT reports that the Project's doctoral fellowship programs has "become a hostage" to the more attractive opportunities provided by the Peace Fellows program. And the University Linkage Project appears to see itself as a mechanism to mobilize faculty in CU and at other Universities to do some of the same things the DRTPC is doing at CU, rather than to make it possible for the Center to involve faculty drawn from other Universities in its own projects. CU/MIT addresses sustainability of faculty research and service activities by building organizational capacity within one University. The University Linkages project is not addressing organizational development and sustainability within Universities in a comparable manner.

In addition to potential problems arising from apparently divergent program and project strategies, it appears that different offices within USAID itself could benefit from drawing on the resources of DRTPC. The Mission is a potentially significant market for the Center's services, and it would also seem that the Mission should, where appropriate, utilize the resources that it is supporting within CU.

DRTPC, therefore, raises two separate but related issues for AID: (1) how to coordinate DRTPC with other Mission projects in order to enhance the value of each and to increase their combined ability to achieve program goals, and (2) how to market DRTPC services within the Mission?

A. Conclusion: USAID/C should maximize the use of the DRTPC.

B. Recommendation: HRDC, the division responsible for S&T, productivity, technology-transfer, and university related projects within USAID/Cairo, should develop as soon as possible: (1) a strategy and mechanism to effect mutually supportive coordination among projects in these relevant sectors, and (2) a mechanism to encourage different Mission offices to draw on the resources of the DRTPC for relevant research, training, and assignments.

The GOE pledged to contribute LE 8,500,000 to the Project (See 1980 ProAg amendment). USAID/C might wish to confirm this contribution in the light of CU indirect cost concerns.

6. DRTPC. Manpower, Training, Collaboration and Consultancy

For a period of nearly twenty-five years preceding the break with the Russians in the early seventies, Egypt was isolated from Western progress in S&T. Certainly there were many Egyptians who had been trained in the West but even these did not have the chance for the interaction necessary to keep abreast with Western S&T. Western professional journals and other S&T publications were not readily available. Many Egyptians went to the East for their higher degrees. Many Egyptians during this period who went to the West for graduate degrees did not return. The fourth Egypt 2000 S&T meeting last December consisted of Egyptian-Americans who meet in Egypt to help the educational, governmental, and industrial S&T community.

During this era, the Naser era, S&T laboratories in the Universities had exceedingly small expenditures available for procuring modern research equipment and for purchasing books and journals. Egyptian S&T did not keep up with the rapid progress of S&T in the West or even in the East. The GOE did set up governmental institutions such as the National Research Centre (NRC) whose role was to infuse modern technology into the limited industrial community. Unfortunately the NRC did not do an effective job and became, in effect, another degree granting institution. The NRC never effectively developed the infrastructure nor may it have had the interest to contribute effectively to industrial development.

During this era the university S&T community turned inward. Professors did limited consulting for an industrial establishment which was nearly 100% government owned. They did almost no consulting for GOE technical Ministries. A few did establish or work for outside engineering consultancy firms. That period witnessed the establishment of new universities in Cairo as well as the provinces. The teaching and technical Staff in S&T were recruited primarily from the NRC and from Ministerial research centers. Many professors from the extant universities held part-time teaching jobs in these new universities in order to supplement their meager staff.

The poorly equipped laboratories and the extramural activities left those professors no choice but to pursue the minimum research that was necessary for their academic promotion. The extra income accrued from part-time employment was supplanted by the disproportionate rise in the cost of living that was triggered by the exponential increase in the price of oil.

The subsequent wealth amassed by some Arab States and the ensuing ambitious schemes for building their infrastructure presented ample opportunities for Egyptian S&T professors to rapidly improve their economic well-being. They left in increasing numbers their teaching posts at their Universities to joining new ones in the Arab States. The insatiable desire to do so had to be checked by the promulgation of a law (albeit pertaining to academia only) that restricts the leave of absence for a faculty member to four academic years and only 25% of the staff can be on leave at the same time. The exception to this are the professors of medicine. They earn extra income by having outside medical practices. Therefore, Egyptian health does not benefit from the contributions of these professors whereas there was and still is to a large extent a limited connection of the S&T professors with the technical Ministries and industrial community.

The details of this will be discussed by other reviewers. More importantly, though, MIT has helped upgrade the skills of faculty and other professionals involved in the program. My (Vrebalovich) experience of being involved in administering nearly five hundred S&T projects in two countries plus my participation in exchange of scientist programs plus two years as a

visiting professor at the Indian Institute of Technology in Kanpur, India, plus 27 years as a research scientist, space project manager, and Manager for Research in the Office of Research and Advance Development at JPL have made one thing clear: Collaboration between scientists is the best and most efficient way to transfer technology. Not surprising at all is the fact that both parties benefit. By technology I mean everything from products, processes, technical skills, and use of technical laboratory equipment to management skills. CU departments, laboratories and professionals have only recently had the opportunity to catch up with Western technology. The DRTPC program of CU-MIT is an excellent vehicle for technology transfer.

This Project is not doing enough in upgrading CU laboratories because it does not have the resources or the charter to do this. Perhaps this Project should be expanded or a supplementary project provided to upgrade CU laboratories to the S&T of the 1980's.

The above discussion relates to the effects of collaboration on CU laboratories and professionals. In terms of the consultancy with GOE Ministries, MIT professionals have worked with CU professionals in laying out plans for initially approaching specific problems. They have provided consulting back-up to the CU project groups that is not available in Egypt. Examples of this are numerous - every project has benefitted. For example, sophisticated MIT transportation modelling programs were modified to fit Egyptian conditions. As I understand it, MIT and CU both benefitted from this project.

MIT professionals not only work as consultants to CU, they work as consultants to the technical Ministries. The Ministries benefit from having a problem solved, and professionals within the ministries benefit from contact with the MIT consultants. Further, these MIT and CU consultants provide invaluable advice for upgrading laboratories and facilities within the Ministries. GOE and not AID funds are used for this. As I understand it, both the Electricity and Transportation Ministries have benefitted from this.

In terms of the depth of MIT participation, fifteen MIT professors and as many as forty other professionals including graduate students have been involved in projects. A full time MIT staff member resides in Cairo and a small permanent MIT project staff handles matters at MIT. These interfaces provide excellent support to the Center and to the projects as well as to the MIT professionals at MIT. They serve to identify resources and handle the many visits of MIT personnel to Egypt and Egyptians to MIT.

The key to the success of this program is the dedication of capable individuals. On the MIT side, a capable manager and technocrat provides the mature leadership necessary for a sophisticated project like this one. MIT Project leadership has the experience vital to make a project like this work. Ideas and organization are simply not enough. It takes leadership on both sides, and MIT is contributing its share.

An upgrading of Egyptian Universities and government research laboratories began to take place under the Special Foreign Currency (SF) program of US-Egypt collaborative research programs and AID sponsored S&T projects. The CU/MIT is one of these projects that is attempting to bridge the gap of many years of isolation of the S&T research community from the real world of industry and technical Ministry problems.

## 7. MANPOWER

Of the 4000 CU faculty members, over 200 have been involved plus a number of outside consultants. The involvement has been broad based. Concerns of academic freedom initially expressed have been satisfied with experience. Junior faculty, graduate students and even undergraduates have participated in consultancy projects with GOE technical ministries and industry. The fact that the DRTPC has the infrastructure, contacts, funds including seed money, and that incentive salaries are paid has induced faculty to participate. For the first time younger faculty and graduate students can be paid incentive salaries that are normally available only for senior faculty who do outside consulting or extra teaching to supplement their salaries. Doctors, lawyers, architects and some kinds of engineers have found it

relatively easy to do consulting, establish outside offices and get second jobs that supplement their university salaries. The DRTPC projects involve faculty from a wider base of disciplines than those normally involved with outside consulting.

This Project has successfully met the goal of involving a wide constituency of University professionals including senior and junior faculty as well as graduate degree earning students in DRTPC projects. The list of projects and personnel involved clearly illustrates this. Further when needed the Project has involved consultants from other Universities and GOE agencies--approximately 20 professionals. In this way the base of the program can be broadened. It makes better sense to draw on Egyptian expertise than to import expertise--it's cheaper too.

#### MIT Collaboration:

MIT has helped CU set up the infrastructure necessary for the DRTPC to efficiently manage the consultancy program.

#### 8. TRAINING

In order that the DRTPC be an effective consultant to the technical Ministries and industry, the CU faculty must have a broad spectrum of skills. In some instances present skills are adequate, in some instances these skills must be upgraded, and in others new skills must be acquired.

Several methods and procedures have been developed to broaden the base of capabilities including management skills of the faculty and graduate students of CU. The real goal is to contribute to Egypt's development and much can be done by being effective consultants to GOE Ministries and industry. Hopefully some of the students involved in this program will take these acquired skills and experience into industry.

One of the best ways to acquire new skills is to work with experienced professionals on projects. CU faculty and students work with MIT professors

on research projects. Faculty and students have opportunities to go to MIT for short periods to consult and work on the projects. Working in MIT laboratories with MIT students and faculty is another skill acquiring exercise. Note that there is a CU and a MIT principal investigator on each project except perhaps for some DRTPC projects funded elsewhere.

The "New Initiative Program" begun in 1981 includes internships and doctoral and postdoctoral fellowships. Internships are for qualified graduate Ph.D.'s and young faculty who get to work on projects in industry and ministries. There have been eleven of these with five completed. This is an excellent mode for gaining experience. Hopefully, some of these young faculty will take the opportunity to accept positions in industry or ministries.

Research study opportunities for doctoral and postdoctoral students are available under the fellowship program. Of these awards there have been eighteen postdoctoral students with four completed and sixteen for doctoral students with two completed. These fellowships offer the doctoral student an opportunity to work with a visiting MIT professor. Again these broaden the skills base for consultancies which will contribute to development. Of greatest importance for doctoral students is that they may get funds to support their CU Ph.D. research as well as draw salaries while getting their Ph.D. - most uncommon in Egypt! The DRTPC appointed a senior faculty member to provide "guidance and assistance" to the fellows.

Another activity which has great potential and is used in several countries allows Egyptian doctoral students to do part or all of their research at a foreign University but receive their degree at CU. The MIT/CU Project has sponsored only two students to study at MIT thus far. Both this program and the sponsored doctoral fellowships offer the student an opportunity to work with an MIT professor. Simply taken, collaboration, internships and fellowships offer CU Egyptians the opportunity to upgrade their skills and contribute to Egypt's development.

## 9. CONSULTANCY

There are many yardsticks to measure the effectiveness of the DRTPC as a consultant service. First according to all discussions, both private and group, there was very little interaction between the CU faculty and outside groups such as GOE Ministries, public corporations and private groups. There is not a tradition, or even the opportunity, for faculty to consult on a regular basis for industry, Ministries, and etc. In the West, and certainly at MIT, professors regularly spend a day, week or summer vacations as consultants to government or industry. Not only was there little tradition at CU to do this or little opportunity, there was little confidence in the potential customer in the ability or willingness of the CU faculty to do consultancy work. There certainly was no track record. There were exceptions, especially among civil and architectural engineers as noted in previous paragraphs.

Therefore the seed money provided by AID, the MIT collaborators who participate, and the DRTPC role are the catalyst for getting an entre to the Ministries, public corporations, and others for consulting services. Each of these elements was necessary to get the CU/MIT Project under way. The organization, acquisition of skills, and input of MIT consultants were necessary to give the possible customers confidence in the ability of the CU staff participants to perform a useful function.

The fact that the customers (Ministry, industry, and etc.) did not initially have to pay to have a service performed for them certainly provided a positive incentive. The seed money provided by AID to pay salaries and support the infrastructure was necessary in the beginning. The capacity to provide professional foreign consultants who would work with CU staff and the customer was another incentive to the customer. (Egyptians seem turned-on by the use of foreign consultants!) The customer not only gets the benefit of the MIT collaborator in Egypt, in some instances they, as well as the Egyptian collaborators, get to visit MIT laboratories and other facilities in the U.S.

Not only are the CU professionals getting their professional skills (technology transfer) upgraded, the ministries, industry, and other professionals have their skills upgraded. This is an important incentive which was rather obvious in the discussions I had with the Ministry of Transportation and Telecommunications.

It was clear from the briefings, visits and other discussions that the "customers" are gaining confidence in the ability of the DRTPC to perform a useful and necessary function for them. Seed money and MIT staff were the catalyst, but this dependency will lessen with time. In fact there are now sixteen projects with five completed in which there are no MIT principal investigators and no AID seed money. This is certainly one measure of success.

The CU/MIT Health Care Delivery System Project was noted to me as an effort that did not work too well under the CU/MIT Project. The Project did not fit well with the MIT consultants who were available. In spite of this the Ministry of Health continued the Project on its own. The CU/MIT consultancy was the catalyst for identifying the problem and getting this health project started. As I understand, it has been very successful under the Ministry of Health. There have also been cases where, as a spin-off to a project, a professor becomes a private consultant without any need for DRTPC support. I count both of these modes as a success. The purpose of the Project is to get CU professors involved with the "real world" and to identify and help solve problems involved with Egypt's development.

#### 10. RESEARCH LABORATORIES

The section on training covered many elements of technology transfer, but a look at CU technical laboratories or those of any other engineering or science department at an Egyptian University reveals the state of neglect that exists in most of them. This must certainly reflect on the abilities of the faculty to do useful experimental research. An exception to this is the Military Technical College that has excellent laboratories and well-trained faculty.

Very limited resources have been put into research laboratories of Universities and most government laboratories; the exceptions are those that have been sponsored by AID or SFC. Money for equipment alone will not resolve the overall problem.

There must be incentives for faculties to spend time in the laboratories. The DRTPC program gives that incentive, in terms of salary and identifying projects that might be carried out in the laboratories.

As noted earlier, this Project was not expected to upgrade laboratories at CU nor did it have the funds to do this. It is clear that incentive salaries and capital expenditures are needed for this purpose at CU as well as other Egyptian University and government laboratories.

One excellent benefit has been the investment in GOE Ministry laboratories by Ministries. The DRTPC has certainly provided professional advice which has enabled Ministries to improve or even provide new facilities.

#### A. Conclusions

This Project is a US-Egypt collaborative project in which technology skills are transferred. Ministries, industry and others are benefitting from the Project. For the first time many faculty are consulting for Ministries, industry and others (UN, AID and even a University in Jeddah).

Junior faculty and even doctoral students are involved and can be paid for the research they do. There are also internships and up to the present time there are two sponsored Ph.D. students doing part of their research at MIT and getting their degrees from CU. GOE Ministries are benefitting from the expertise of CU faculty. Very real development problems are being solved. Professionals within Ministries and industry are upgrading their skills while relying on the DRTPC as a consultant service. MIT professionals are not only assisting in upgrading technical capabilities of CU participants, they are also developing consultancy and management skills of CU professionals.

This Project is bringing credit to CU/MIT as well as bringing credit to AID. It is doing an excellent job in meeting research goals noted earlier, although more attention is required to assure the institutional ability of the DRTPC. Collaboration is the best vehicle for technology transfer and collaboration has been effectively used in this project.

The change in 1982 in DRTPC management has increased the effectiveness of the Project. The leadership and support on the MIT side is excellent. The support of the CU President and GOE Ministries has been excellent.

The Project is a long way from being independent of MIT technical and AID funding support. The DRTPC has only been working as a successful infrastructure for the past year. The Project should continue to upgrade technical skills (technology transfer) of CU professionals.

The technological base of the CU consultants must continue to be broadened. DRTPC seems to be involving an increasingly wide base of technologies while using present expertise in self-financed (i.e., customer financed) projects. Fellowships, especially those in which doctoral candidates do part of their research at MIT, are valuable.

#### B. Recommendations

This program is just reaching a "critical mass" in terms of developing viable consultancy services for Ministries, industry, et al. The three years prior to the new DRTPC management last year were not as fruitful as they should have been. In spite of these difficulties the Project progressed. The MIT/CU Project should be continued subject to acceptance of the recommendations mentioned elsewhere in this report.

In addition, AID should take a careful look at the possibility of upgrading not only CU laboratory facilities but selected laboratories in the entire university and government sphere - e.g., NRC, Ain Shams, and etc. This is of course a separate project but the mode of operation developed under the Project could be used for this purpose. MIT, another U.S. university or a consortium of American universities might be used for this purpose.

Further examination should be made to get this Project or another project involved with the private sector. This Project has not done this, and it may not be possible under the present guidelines. Incidentally, the agricultural sector should not be neglected. Food storage, food transportation, and food handling are also possible subjects for collaboration.

V. Progress Toward Fulfillment of the 1980 Evaluation Report  
Recommendations (1)

(Note: Recommendations of the Evaluation of the Cairo University/Massachusetts Institute of Technology Planning Program [AID Contract NE-C-1291] dated July 1980 were included as part of the Amendment One Project Paper for the Development Planning Studies Project 263-0061.)

\*A. General

1. The AID/MIT/Cairo U program should continue, with modifications to insure a transition to an independent Egyptian capability

The program has been succeeding, at both the output level of useful research results and at the purpose level of enhanced institutional capabilities. Just to evoke a reaction, we suggested in Cairo that since progress was good, perhaps MIT was no longer needed. The reaction was strong that MIT can make an important contribution to consolidate the good foundation built thus far.

In view of its successful procedures, one should move with caution to make modifications. Our general recommendation is that more planning emphasis go to the institutional characteristics of success. This will probably mean that research projects should be

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(1) In the presentation that follows, quotations of recommendations from the 1980 evaluation are indented, single spaced and placed in quotes. Though somewhat cumbersome for readers to follow, the evaluation team believed the full presentation of recommendations was preferable to paraphrasing. After each quote, observations are made by the 1982/3 evaluation team.

selected or directed to help parts of the University or Ministries which need more experience with research. It will also mean that the training which occurs as part of the conduct of research projects should be supplemented in some particulars."

From October 1980 until the spring of 1982, the DRTPC suffered from an hiatus in leadership. This impacted negatively on the process of institutionalization. The evaluation team is well satisfied, however, that the hiatus was beyond the control of the DRTPC and MIT. Recognizing this, parties to the project (USAID, DRTPC and MIT) agreed upon the necessity to reorganize the final phase. A new scope of work was prepared by MIT and Cairo University based on the 1980 evaluation, USAID/Cairo recommendations and priorities and directions indicated by the Director appointed in early 1982. The new scope of work is expressed in the draft proposal received from CU/MIT in 1982 in which it proposes an extension of the project for two additional years with full program effort to be followed by six months of phase out with reduced funding. (New PACT June 30, 1986) Total additional funds proposed for the extension are \$14,000,000.

The DRTPC has developed and applied new criteria for selecting research projects. Since June 1980 seven CU/MIT projects were phased out and six new ones developed. Since 1980, CU/MIT projects have involved several new faculties at CU (Table 1) and GOE Ministries (Table 2). A growing number of CU faculties and departments benefit from fellowships and internships (commencing October 1981) (Table 3). Faculty involvement since 1980 also indicates the DRTPC's commitment to inter-disciplinary research which, in the opinion of the evaluation team, is a very significant development, replacing as it does the single faculty approach to research which characterized most pre-project work at CU. In developing and using the new Project selection criteria, the CU/MIT program has clearly opted for projects in which quality could likely be assured. While being aware of the desirability of broadening CU and Ministerial involvement, the DRTPC has correctly, in the opinion of the evaluation team, decided that broadening the base of cooperation should never be at the expense of quality research.

CU/MIT continues to offer short courses (Tables 4 and 5). The supplementing of short courses should be thoroughly explored, particularly for ministerial personnel. This is not to say that the Project should undertake to fund long-term academic training. It should not, because USAID/Cairo has other projects for funding long-term training. What is needed are clear plans which relate long-term and short-term training to the needs of client ministries. It may well be that for some Ministries, the first step to longer-term cooperative enterprise may be the up-grading of Ministerial staff.

TABLE 1

INVOLVEMENT OF CAIRO UNIVERSITY FACULTIES AND DEPARTMENTS IN CU/MIT  
PROJECTS INITIATED SINCE JUNE 1980

<u>Project</u>	<u>Cairo University Faculties and Departments</u>
Resource Development and Policy: Petroleum	Faculty of Economics Department of Geology, Faculty of Science*
Urban Infrastructure	Urban Planning Institute* Department of Architecture, Faculty of Engineering Department of Public Works, Sanitary Engineering Division, Faculty of Engineering*
Qattara Depression	Department of Meteorology, Faculty of Science* Department of Irrigation and Hydraulics, Faculty of Engineering
Auto Production Planning	Institute of Statistical Studies and Research: Operations Research Department* Computer Science Department* Department of Applied Mathematics and Physical Sciences, Faculty of Engineering* Department of Electric Power, Faculty of Engineering
Energetics in the Egyptian Metal Industries	Department of Metallurgy, Faculty of Engineering* Department of Mechanical Power, Faculty of Engineering* Department of Mechanical Design and Production Engineering, Faculty of Engineering Department of Electric Power, Faculty of Engineering
Gypsum Quarrying and Product Manufacturing in Egypt	Department of Mining, Faculty of Engineering*

\*Indicates new department involved in CU/MIT Program.

TABLE 2

INVOLVEMENT OF MINISTRIES AND GOE AGENCIES IN CU/MIT RESEARCH ACTIVITIES  
AND FELLOWSHIPS INITIATED SINCE JUNE 1989

<u>Project</u>	<u>GOE Ministry or Agency</u>
Resource Development and Policy: Petroleum	Ministry of Planning Ministry of Petroleum* Egyptian General Petroleum Company* AGIBA (state petroleum operating company concerned with natural gas)*
Urban Infrastructure	National Organization for Water and Sanitary Drainage* General Organization for Physical Planning
Qattara Depression	Civil Aviation Authority, Department of Meteorology* Ministry of Electricity and Energy
Auto Production Planning	El Nasr Auto Company* Ministry of Industry
Energetics in the Egyptian Metal Industries	Egyptian Iron and Steel Corporation* Misr Aluminum Company* Ministry of Industry
Gypsum Quarrying and Product Manufacturing in Egypt	Fayoum Governorate*
Ministry Internships	Egyptian Iron and Steel Company* El Nasr Organic Chemical Company* Egyptian Portland Cement Company* Delta Steel Company* Ministry of Electricity and Energy New Valley Governorate* National Cement Company* Electricity Distributing Company for Cairo*

\*Indicates new ministry or government agency involved in CU/MIT Program

TABLE 3

INVOLVEMENT OF CAIRO UNIVERSITY FACULTIES AND DEPARTMENTS IN CU/MIT  
FELLOWSHIPS AND INTERNSHIPS INITIATED SINCE JUNE 1980

Faculty of Engineering:	Civil Engineering Irrigation and Hydraulics Mathematics and Physical Sciences* Electric Power and Electronics Biomedical Engineering* Aeronautical Engineering* Chemical Engineering* Architecture Structural Engineering Metallurgy, Mining and Petroleum* Mechanical Production and Design Mechanical Power*
Faculty of Science:	Physics* Geology* Astronomy*
Faculty of Economics and Political Science:	Economics Political Science
Faculty of Commerce:	Accounting* Management*

\*Indicates new department involved in CU/MIT Program

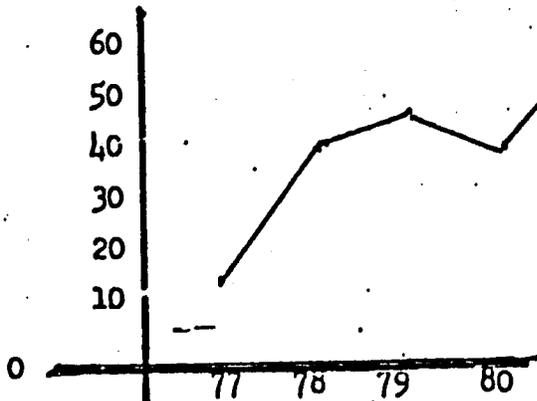
TABLE 3 (CONT.)

UPDATE OF DATA ON CU/MIT EGYPTIAN PARTICIPANTS

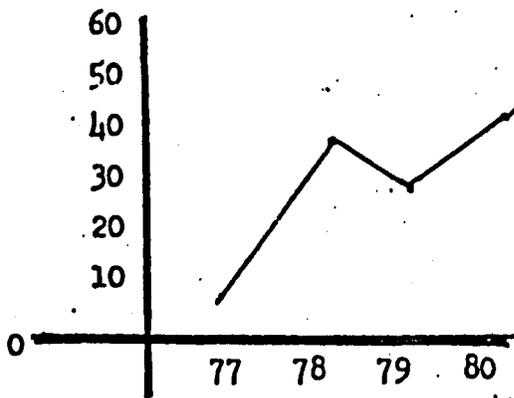
Chart originally prepared for 1980 evaluation

Number of professional people substantially and continuously participating in the CU/MIT program as of May each year.

Cairo University Faculty 78 in 1982



Cairo University Graduate Students 68 in 1982



Government of Egypt Ministerial Staff 64 in 1982

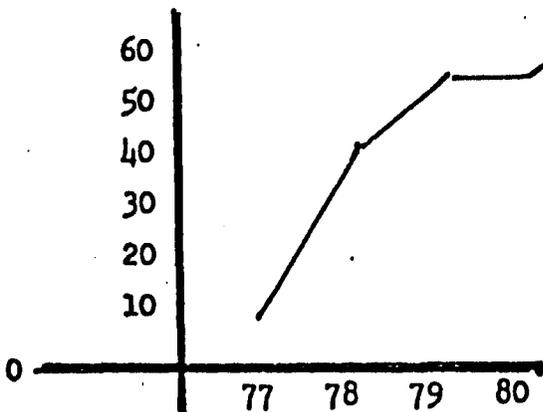


TABLE 4

WORKSHOPS AND SHORT COURSES HELD BY CU/MIT PROGRAM SINCE 1980

<u>Date</u>	<u>Title</u>	<u>Scope and Participations</u>
January 1980	Management of the Construction Industry in Egypt	60 top construction industry managers, ministry officials, and university faculty and students attended to review, discuss and debate important industry issues. The workshop was designed to provide an understanding of constraints limiting company growth and entrance of new firms into the construction sector with a fuller appreciation of the applicability or non-applicability of modern project management techniques.
January 1981	Management of the Nile Delta Groundwater Aquifer	Over 80 participants from government agencies, three Egyptian universities and two U.S. universities. Workshop focused on the management alternatives for the Nile Delta Aquifer. Newly recognized upward leakage of groundwater in the Delta area has caused concern within the Ministry and research findings were used to discuss the impact and alternatives.
January 1982	Analysis of Water Resources Systems	This workshop incorporates research results and techniques developed since the first workshop held in 1978.
10-11 January, 1982	Communication for Rural Development in Egypt	This seminar presented results of research by the Communication Project and included sessions on communication structure and policy in rural Egypt, appropriate technology for rural development, technological alternatives and telecommunication policy in Egypt, and development communication and national development.
23 May 1982	Plastic Piping for Potable Water Supply and Drainage Systems	Attended by 90 people. Approximately 40% were representatives from the private construction industry.
1 November 1982	Workshop on CU/MIT Petroleum Project	Attended by 20 people from all groups participating in the project.
November 1982	Design of Irrigation Structures	20 ministry participants attended this short course, which took place at the DRTPC over a three week period.

TABLE 5

FUTURE CONFERENCES, SEMINARS, AND SHORT COURSES EXPECTED FOR THE DRTPC IN  
ADDITION TO ANNUAL PROGRAM CONFERENCE HELD IN JANUARY

<u>CU/MIT Project</u>	<u>Expected or Potential Activity</u>
Electric Power System	May repeat short course held in January 1979, with emphasis on reliability in systems planning.
Intercity Transportation	One seminar is held each year in addition to January Program conference.
Engineering Applications for the Plastics Industry	Short course planned on plastics engineering for production engineers from public and private sector companies.
Water Resource Planning	Third major conference on water resource planning will be held in June 1983.
Stochastic Models of Nile Inflows to Lake Nasser	Will participate in June 1983 water resource conference. May hold a short course on advanced principles of hydrology for graduate students at Cairo University.
Resource Development and Policy: Petroleum	Will hold a workshop on natural gas next year.
Urban Infrastructure	Will hold a seminar later in the year to present project findings.
Auto Production Planning	Planning a 3 month workshop on operations research to be held for 20 employees of El Nasr Automotive Company. A 10 day workshop for 30 employees would also be held. This is to assist in the establishment of a Department of Operations Research at the company.
Energetics in the Egyptian Metal Industries	Short courses anticipated.

"2. Clarify the purpose and the end-of-project status.

For the second part of the contract, it would be useful for the various parties involved - Cairo University, including the several interests represented in the Center's Board of Directors, the USAID and MIT to agree on what they now consider a realistic statement of purpose. For instance, does it include project development as well as problem solving? Then the statement should be generally known, so that all people working on sub-projects address themselves to its achievement. For instance, Ministries should be aware that they ought to be concerned about training people as well as about helping plan and produce research results.

Probably more important than the wording on the purpose is the description of the conditions which should exist with success - "the end-of-project status." Chapter I of this report suggested characteristics of success for the Center, the University, and the Ministries. Each of these needs to be considered by the interested parties.

For instance, if one of the three capabilities of the Center is agreed to be to facilitate contacts between faculty members and Ministry officials, the nature of this facilitation may need to be considered in more detail. If a Ministry comes with a problem, how should the Center proceed to mobilize a team to prepare a proposal? If a faculty member initiates a proposal, how should the Center help in getting support from a Ministry sponsor?

The second capability suggested for the Center is to assure proper selection of research tasks and proper quality for results. The Evaluation Team considers this so important that it has made a separate recommendation on this topic. (Recommendation 4 for Center)

The third characteristic of success deals with logistic support for researchers. Here, there is a recommendation (#3) that the Center adapt procedures of the Liaison Officer to fit Egyptian needs.

It may be that other capabilities are also desirable for the Center.

The essence of the characteristics of success suggested for both the University and the Ministries is a critical mass of trained people. The Evaluation Team did not attempt to determine the desirable numbers or to describe the skills. For the University, the approach may be to have a trained nucleus in each department which can contribute to development problems. For Ministries, the target might be expressed in terms of a functioning unit to plan and coordinate research in each major department."

In late 1980, parties to the Project re-defined the end of Project status.

"Cairo University: For those departments which can contribute to the development goals of the government, a nucleus of faculty will have been trained through the Program, who will be able to continue similar activities with the Center.

GOE Ministries: In those ministries whose function addresses the development goals of Egypt, a nucleus of personnel will have been trained in planning and coordinating interdisciplinary and cooperative research. Organizational changes will have taken place which will facilitate usage of the research techniques and approaches emphasized by the Program.

Development Research and Technological Planning Center: A Center will have been established at Cairo University as a permanent mechanism to conduct applied research activities related to the priority requirements of Egyptian economic and social development. A solid administrative infrastructure will have been developed and maintained, which will be capable of managing several types of research and educational activities. The Center will have demonstrated its ability to attract substantial amounts of funding to support these activities."

In the opinion of the evaluation team, these definitions are less than useful. "Those departments..." are not defined; "a nucleus of faculty..." gives no indication of the numbers, kinds, levels for training which implies that no survey of faculty competence by department has been made; "In those ministries..." provides no sense of just who in the GOE is to be involved; "Organizational changes will have taken place..." gives no indication of just what the changes are much less just how the project intends to bring such changes about; "A solid administrative infrastructure..." is hardly an adequate description of what is to be achieved.

Not only were these guidelines inadequate, they were late in coming. In the opinion of the evaluation team, the usefulness of the above indicators and the tardiness accompanying their submission attest the indifference of all involved in dealing with the problem of institutionalization. More recently received indicators are given below.

\*6. Feasibility Issues: Schedule for DRTPC Self-Sufficiency and Indicators of Progress

The indicators of progress towards institutionalization have been divided below between those associated with the development of the DRTPC organization (administrative) and those associated with the DRTPC's research and educational activities (program). Establishing solely quantitative targets for numbers of people participating, courses or fellowships offered, or papers produced could easily become an end in itself and give misleading results. Quality must be the predominant characteristic in the establishment and evaluation of these indicators.

Administrative Indicators

- \* Development of an organizational structure with the following major functional areas:

- Administration, Personnel, and Legal Services
- Public Relations Services
- Accounting and Financial Services
- Reports and Publication Services
- Library Services
- Computer Services

- \* Clear delineation of responsibility and effective delegation of authority.
- \* Establishment of and adherence to written administrative plans, policies and manuals. Evidence of internal review and revision on a periodic basis to provide maximum efficiency and responsiveness.
- \* Evidence of effective recruitment, compensation and performance review procedures for administrative personnel.

### Program Indicators

#### Relevance of Research and Educational Activities

- \* Ministry incorporation of results and innovative research methodologies.
- \* Willingness to provide follow-on funding.
- \* Willingness to build on expertise, either through new areas of research by expanding the base of personnel or technical specialities within a ministry.
- \* Establishment of regular and on-going training programs, both in terms of fellowships and short courses. Eagerness to participate and quality of final results.
- \* Perception of the Center as an organization of excellence. Prestige conferred upon participants.
- \* Continuity of support by Cairo University and Government of Egypt through administrative and political changes.
- \* Evidence that a variety of institutional ties have been established, with an emphasis on quality and concrete results.

#### Attitude Change

- \* Expanded base of involvement at Cairo University, new faculty members and new departments.
- \* Continued utilization of new skills.
- \* Increased base of involvement with the ministries.
- \* Willingness on the part of Cairo University to take the initiative in proposing, designing, and implementing new activities.
- \* Institutional changes made at Cairo University and ministries, following the example of the Center.

#### Effectiveness of the Center's Research and Educational Operations

- \* Environment created which is conducive to research.
- \* Establishment and proven effectiveness of quality control procedures in activity selection and operation.

- \* Quality of activities for which outside funding is obtained.
- \* Implementation of an efficient and responsive administrative infrastructure.

#### Financial Self-Sufficiency

- \* Marketing plan developed and operational.
- \* Evidence of different methods of identifying and successfully soliciting financial support.
- \* Diversity and magnitude of funding: source, type and length.

Five major sources expected:

1. Grants from Egyptian government organizations for general training and administrative activities.
2. Grants from Egyptian government organizations for research and technical assistance programs.
3. Direct research contracts with Egyptian institutions
4. Direct research contracts with foreign institutions
5. Grants or endowments from international organizations.

Rather than focusing on a long-term detailed program for self-sufficiency, the Program has chosen to review progress of the Center in terms of these indicators on an annual basis, and at that time set specific objectives for the coming year. In this way, the Program has avoided becoming locked into directions that could prove to be unproductive.

In the opinion of the evaluation team, failure to focus upon and elaborate a long-term program for DRTPC self-sufficiency is a serious shortcoming. In the absence of some agreed upon "end state," reviews will necessarily be limited to measuring how far the program had progressed in any one-year period rather than how far the program has to go before reaching the self-sufficiency "end state". While the evaluation team acknowledges that many desirable events have occurred in the program, it is nevertheless unable to relate the accomplishments (or failures) to some agreed upon final status for the project. The evaluation team further believes that the single-year

strategy of measuring progress failed to take into account research and institutionalization efforts which might take more than one year to accomplish. While the evaluation team agrees that purely quantitative indicators of progress (e.g., numbers of people trained), are not sufficient alone, it does not agree that the Project's purposes were well served by avoiding the issue altogether. For example, the issue of funding sources is hardly well treated by limiting end of project status indicators to listing five possible sources of funds. Indeed, planning to date in the Project seems to suggest that designers believed that the funded demand for DRTPC services, in an amount sufficient to meet likely direct and indirect operating expenses in year "N", would automatically follow if the institutional supply side (e.g., DRTPC) was created. Evidence presented elsewhere in this evaluation suggests strongly that this assumption may be spurious if not fatal. Indeed, there is evidence from other similar centers around the world that failure to design supply services in rather strict conformity with demand usually results in the successful institutional operation where the organization dies. In the opinion of the evaluation team, far too little has been done to clarify useful end of project indicators, particularly on the income issue and what little has been done is too late to permit useful corrective action within the time limits of the current Project.

"B. Recommendations for AID.

The USAID, of course, will be responsible for deciding which of these recommendations it wishes to include in the project implementation order requesting a new contract and for overseeing the program during the next three years. Beyond that, the following recommendations are addressed specifically to AID:

1. Provide better backstopping for the program in the Near East Bureau of AID/W.

The most important period will be the next few months when the contract is being renegotiated. But some support will undoubtedly be needed during the life of the program. For example, assistance of AID/W will be needed to arrange for a connection between the Center and the National Technical Information Service of the Department of Commerce. There will be questions to answer for Congress and others.

2. Establish regular liaison between the USAID and the DRTP Center to keep it informed about USAID activities.

Dr. El Salmi, the Center Director, requested such liaison. It should be of mutual benefit and not require much effort. For some USAID activities, Center data will be helpful. In other cases, USAID consultants will produce development data which should go into the Center's library.

3. Improve the USAID efforts to keep AID/W well informed about project status

Field-headquarters communications are a continuing problem for most programs. The field project officer lacks time to do much reporting. Also, the tendency is often to guard against unwarranted second-guessing from headquarters. Nevertheless, the advantages of an informed headquarters justify extra effort. Perhaps the USAID can suggest to MIT ways to make the regular progress reports more useful. Or perhaps the USAID can use the occasion of the project reports to make a few brief comments of its own.

4. Arrange for the DRTP Center to be linked to the National Technical Information Service.

The NTIS is a program sponsored by AID/W for services to developing countries. The Center is interested in helping faculty members stay up to date and in providing data of use to researchers. When the Center receives NTIS accession lists, it will need to make some arrangements to inform its program coordinators and principal investigators so that they can select pertinent documents which the Center will request from NTIS."

It is reasonably clear that USAID/Cairo accepted all the recommendations of the 1980 evaluation. The 1980 Project Paper Amendment notes, "...activities will follow closely recommendations made by the evaluation team for emphasis on the institution building objectives and the phase-out of the direct AID-funded contract." (page 6) Regretfully, however, the revised contractor scope of work does not reflect the emphasis on institution building nor the desired detail recommended by the evaluation. For example, the 1980 evaluation strongly recommends that "the achievement of desirable elements of successful institutionalization is more likely if there is an overall plan with interim targets." It has not been developed. In short, it appears

that useful and accepted recommendations did not find their way into scopes of work. Consequently, as noted elsewhere in this report, the Project still labors under interim (one year) targets without benefit of having a plan for relating interim targets to some agreed upon end-of-Project status.

Regarding the improvement of informational linkages, the evaluation team was advised that they have been improved. USAID/C's Development Information Center (DIC) is available to the DRTPC. Through the DIC, copies of all consultant reports can be made available. The DRTPC has also received a list of shelf holdings in the DIC. The link between the DRTPC and the National Technical Information Service has not been formed. USAID/C staff advise that they have had no request to facilitate establishment of the link, but see no problems in doing so if and when a request is received.

\*C. Recommendations for MIT

1. In collaboration with Cairo U and USAID, develop a three-year operational plan.

Annex A for the Project Agreement and the AID-MIT contract set some targets in terms of the number of research projects, the establishment of a Center and the general phasing of the budget. This was adequate for Part I of the contract. For Part II, however, the achievement of desirable elements of successful institutionalization is much more likely if there is an overall plan with interim targets. This should be developed in collaboration with Cairo U and the USAID. Such collaboration will take some time but will add to the realism of the plan and increase the chances of success.

This operational plan should start with the end-of-project status described in the second general recommendation above. It should then delineate current status for each indicator of success. It should then lay out a strategy and tactics for progressing from current status to desired end-of-project status. Interim targets and budget can then be set.

MIT has devised a number of proposals for new activities, such as short-term (3 month) research projects, support and supervision for Cairo U theses, graduate fellowships. It has worked out unit costs, proposed volume, and total cost for each of these proposals. However, none of them have been related to specific program objectives in more than a general way. Nor have these supplemental activities been integrated with the training expected from continuation of current research projects. A good operational plan consists of more than a set of independent activities.

The next four recommendations deal with particular aspects of a total operational plan.

2. Set targets for numbers and types (disciplines) of Cairo U and Ministry personnel to attain capability in interdisciplinary and collaborative solving of development problems.

One of the most important aspects of end-of-project status will be faculty members of Cairo U who are well trained in planning and managing research projects. In addition to these general skills, MIT and Cairo U planners may decide that some people will need some special skills in such subjects as sampling, questionnaire design, computer programming, etc.

When the targets are determined, MIT and Cairo U should then plan how they will be achieved--some will learn from on-the-job experience in the conduct of research projects with MIT colleagues or with more experienced Cairo U colleagues; some will learn from graduate work at MIT; others will have supervised theses at Cairo U; special short courses will supplement such experience, etc.

It will also be desirable to develop similar targets for particular Ministries and then make plans for achieving them.

3. Add more formal training.

In the first part of the contract four workshops were held. Each of these dealt with particular substantive topics - polymers, water resource systems, reliability of electric power systems, and housing materials. Also there have been short courses on such special subjects as stochastic principles, computer programming, weighing and measuring babies, and administering village questionnaires.

Some of the Principal Investigators suggested that more general short courses would be useful. They specifically mentioned a course on proposal writing and on budgeting for research projects. Perhaps such courses could be developed in a way comparable to that used for the training on stochastic principles, which was given jointly by MIT and Cairo professors. When such courses are developed, they should be given several times, for faculty not yet engaged in research projects and for faculty of other universities (see also recommendation #6 for the DRTP Center).

3. Adjust MIT project support to the phase reached by each research project.

The phasing out of support as research projects gain maturity in an institutional sense, including the possibility of support from Ministries, is an important characteristic of an institution-building project. The criteria for support are not identical to those of projects for which research is the only purpose.

4. Gradually merge the functions of research management and logistic support performed by the Liaison Office and the DRTP Center (except the Liaison Officer functions of financial accountability for MIT).

The desirable situation will be a single organization providing contact with Ministries, assuring good quality of research, and serving research teams. For the duration of the MIT contract, a partnership should function, with researchers informally exchanging ideas regardless of the source of funding for their activities. When MIT faculty members come to Cairo, they should drop in on the Center director and also talk with the pertinent program coordinator. In an informal way, they can be useful for commenting on project proposals and research methods. The bi-weekly meeting for Principal Investigators should include investigators for both Center and MIT projects.

The merging of individual functions need not happen at the same time for each function but can proceed as seems most convenient and practical.

It is recognized that for reasons for financial accountability, MIT will need to continue to have a Liaison Officer who signs checks. Whether this also

necessitates a separate accounting unit is not certain. It is possible for a single accounting unit to maintain two or more sets of accounts, one for each kind of fund.

6. Coordinate total MIT program.

All the separate activities under the MIT program should contribute to achievement of the overall purpose of institutional capability. Then each research project should be monitored from the point of view of what it is doing to enhance improved research planning and management and to train people as well as what research results it is achieving. When a training activity is prepared for one project, consideration should be given as to whether it should be opened to others. Just as Cairo U investigators should meet from time to time in order to consider progress toward the overall purpose and to exchange information on actions employed to enhance institutional capability."

No clear and definitive operational plan was developed for the final three years of the current Project. While MIT did submit an operational plan to achieve institutionalization with its Semi-annual Progress report for April 1981, this plan, in the opinion of the evaluation team, is at best only marginally useful. It does not describe the nature of the final self-sustaining institution, is non-quantitative, does not assign responsibility for assuring that desired events occur, gives no clear idea of the process for phase out, does not differentiate between essential events and peripheral ones and gives no indication whatsoever of what might be done if one or more of the events did not occur. In short, the operational plan is not a plan at all. The evaluation team feels strongly that this three year plan, perhaps better than anything else, demonstrates that the issue of institutionalization has received far less than adequate attention. One could have expected that the process of institutionalization lent itself to Critical Path analysis - i.e., some accepted analytical format devised for laying out events, sequence, etc. Furthermore, the plan says nothing at all about the nature or level of expertise required in client Ministries, which seems to confirm the evaluation team's belief that efforts have centered around organizing the supply side on the assumption that demand would and could follow.

Even though the program has not benefitted from an overall three year operational plan, it would be a mistake to suggest that there has been no progress on developing the DRTPC institution. The evaluation team found clear evidence of broadened support in both Ministries and Cairo University. The development of an organizational chart for the DRTPC, job descriptions for all staff, the merging of the liaison office into the DRTPC, merging of payrolls, and development of the computer center, all attest vigorous activity related to developing the DRTPC as an independent functioning organization. Laudable as such efforts have been, it is perhaps fair to speculate on how much more might have been accomplished had such work been guided by an overall development plan. In short, the evaluation team is satisfied that commendable progress has been made, but more, perhaps could have been achieved over the same time period had there been better and more precise planning at the outset. Had a plan been developed in 1980, there would have at least been some blueprint for action during the almost two year period of leadership hiatus. For example, if for some reason research lagged, emphasis might have been shifted to training: if both lagged, then perhaps emphasis could have been directed to up-grading Ministerial staff. In the absence of having some end of project indicators and a long-term (3 year) plan for getting there, alternative interim strategies reflecting constraints were not developed. The evaluation team believes that failure to develop a long-range three year plan was the most serious oversight in project activities to date.

\*D. Recommendations for the DRTP Center.

1. Over the long run, the Board of Directors should become more representative of the organizations to be served by the Center. Although the Center is properly a part of the University, it exists to facilitate cooperation with Ministries. It must obtain money from Ministries to support research and training activities. Then it must assure a high quality of performance so that continuing funds will be forthcoming. With such an orientation, the Center will be well served to have the viewpoint of its clients well represented on its Board. At present, its only client Minister, Dr. Abdel Razzak Abdel Meguid, has broader responsibilities as a Deputy Prime Minister.

2. Organize Center with three divisions: Training, Research and Administration

If the Center evolves as now appears likely, with an ambitious management training program, there is some danger that research would receive inadequate attention as more of the time of the Director and of the administrative staff was devoted to arranging and conducting training sessions. To help assure effectiveness in each of the functions, it would be desirable to organize three main divisions within the Center. Training activities could be headed by a training specialist, research activities by a scientist, and administrative activities by a manager.

3. Adapt Liaison Office procedures with modifications to fit Egyptian needs.

As the functions of the Liaison Office and Center are gradually merged (see recommendation #5 for MIT) careful analysis will be needed about the rationale and effects of various procedures. Sometimes they exist to assure accountability. Sometimes they are a means to obtain professional judgment and thus enhance quality control. An example may be some of the clearances by the Executive Committee. Careful attention to budgeting may often be regarded as a way of encouraging systematic planning and management of research projects.

However, some of the current forms and procedures may be necessitated by rules of MIT or AID. These may need to be modified to fit Egyptian rules.

The point for an organization like the Center which serves research projects is to devise the proper balance. On the one hand, procedures should be simple and rapid. On the other hand, procedures should encourage careful planning, sound management, and high quality. In the long run, the reputation and success of the Center will depend upon research results which are useful to Ministries.

4. Formalize criteria and procedures for project selection and quality control.

The Center probably should not accept every contract which is proposed or offered. Possible reasons for refusal might include irrelevance for

development, lack of a researchable hypothesis to solve a problem, inadequate budget or time to produce a satisfactory research result, lack of qualified faculty researchers for the problem (even if faculty are recruited from other universities), or lack of a Ministry liaison office with sufficient authority. Other reasons for refusal may also occur to the Board of Directors. Refusal will be easier if criteria are written and known in advance. Then it will be easier to resist political pressures or to negotiate for a more adequate budget.

An important aspect of project selection is to assure that the problem has been clearly identified and that the client Ministry and faculty researchers are agreed about its nature and the method of attack. Also, before a contract has been agreed upon, professional review of a proposal is needed to consider not only the methodology but the realism of the estimated man-days and costs.

For Cairo U/MIT projects, at least at the beginning, total funding came from AID. Budgets by the Principal Investigators were necessary, but the Ministries were concerned more with the relevance of the research than with its cost. Now as the Ministries agree to pay for contracts, a new element has been added. Previous experience of Ministries with consulting contracts may be analogous but is not exactly the same.

A common practice for research organizations is to set up one or more review committees composed of knowledgeable professional personnel who are not themselves personally involved in the proposal being reviewed. Such a review serves several purposes. It protects the researcher against starting a project without thinking about some key aspect. It protects the head of the research organization from a project which may incur a deficit or fail to fulfill its promises. It protects the client agency against wasting research funds on activities with slight chance of success.

Thus, the Center would be well advised to set up special committees and formal procedures for review of proposals, for checking on research progress, and for approving final reports. Having the review committee separate from the Program Coordinators would have some advantages. The coordinators will be busy promoting and negotiating - they may not have time for review. Also the coordinators will be personally involved with some proposals.

With formal criteria and formal procedures, the Center will build a reputation for quality which will create demand for its services and facilitate a sound financial operation for itself and, through its payments of overhead costs, a financial assistance for the University in general.

5. Use MIT personnel as consultant to the DRTP Center.

Dr. El Salmi and some of the Program Coordinators have both suggested that they would appreciate being able to receive advice from MIT professors about various problems such as proposals for new projects, devising or modifying a research approach, reviewing research results, etc. Such involvement by MIT people would be consistent with the philosophy of transition in the type of technical assistance. That is, as institutional capability of Cairo U and the Center progresses, MIT's role should evolve from full participation in research teams to that of monitor and consultant.

Some of the consultation can occur on an informal basis as MIT Principal Investigators are in Cairo for their own projects. In addition, there probably should be some provision for consulting time in the program plans and budget. MIT professors will want such time to count as part of their required fifty-percent of their time for research. This can probably be arranged, with the work to help the Center being considered an outgrowth of one of the Cairo U/MIT research projects or being considered as research supervision.

It is assumed that MIT personnel are experienced enough in this kind of consultation that they will not let the Center personnel use the consultation as a way of avoiding responsibility for decisions.

6. Sponsor training for Cairo U investigators in various aspects of research methodology.

Recommendation 3 for MIT called for more formal training. All such short courses should be given under the sponsorship and administrative control of the Center. Courses which may be developed jointly by MIT and Cairo U personnel and given jointly in the beginning will eventually become all-Egyptian. As such, they may continue to be given under Center sponsorship or elements of some courses may become part of the curriculum of various faculties. An

aspect of institutionalization will be regular, continuing training of graduate students at Cairo U in various up-to-date aspects of research methodology. Then the Center may wish to concentrate its efforts on elements of most importance for its own operations, such as proposal writing, budgeting or management of research teams.

7. Recruit faculty from other Universities when needed.

The comment in Chapter V on lack of academic manpower suggested several ways to cope with the problem. The easiest in the short run will be for the Center to recruit faculty from other universities as part of the teams it organizes to respond to Ministry needs. Such inclusion of faculty members from outside Cairo U will have another advantage - it will help, in a small way to spread the influence of the Cairo U/MIT project and be a first step toward replication of the procedure of mixed academic-government teams to solve development problems.

8. Establish a policy on patents for inventions resulting from the Center projects.

One of the Cairo U/MIT research projects, rural communications, has resulted in two inventions. Thus far no effort has been made to obtain a patent on the new devices. The Principal Investigator, Professor Kamal, is also a director of Benha Electronics, which is manufacturing the prototypes. He believes that he has an informal agreement that Benha will pay royalties to the DRTP Center if manufacture is undertaken after the experiment.

In other parts of the world, policy on patents has been a major problem for research organizations. Policies followed vary greatly. Some release the inventions to the public. Some allow an individual researcher to obtain a patent and receive royalties. Some reserve the right to patents and royalties for the research organization, with the theory that the work was usually done by groups which could not have functioned without support of the organization.

The Board of Directors may wish to establish a policy to be followed for inventions resulting from Center projects.

9. Investigate follow-on funding from UN sources for projects of strong interest to other nations.

Various aspects of current or future research projects may be of interest to non-Egyptian sources of funding, as has been illustrated by the ITU contract for a report from the Rural Communications project. Two aspects of the work on water resources would appear to be of possible interest to UN sources since they involve international resources. These are the Nubian Aquifer and the Upper Nile."

Much has been done to develop and/or improve the organizational structure of the DRTPC. The Board of Directors has been expanded. The Minister of Electricity joined the Board in mid-1982 and two additional Ministers have just joined the Board. The entire CU/MIT Executive Committee has been appointed to the Board of Directors assuring closer cooperation between the CU/MIT Program and the Center.

The Center was re organized in May 1982 in conformity with the evaluation guidelines. Research areas are being assigned to Program Coordinating Committees each chaired by the Director of the Center. A Fellowship Director has been appointed and charged with developing and implementing the Center's overall instructional program.

A Personnel Policy and Procedures Manual has been completed and replaces the old Liaison Office Manual. A manual of accounting procedures has been developed and is being implemented in stages.

Definite and positive steps have been taken to formalize criteria and set project selection and quality control. The Center reviewed its existing research at the time of the reorganization which started in March 1981. Several projects (which had been funded internally) were phased out because they were considered inappropriate [e.g., had cost overruns which could not be justified]. New proposals for research contracts are now reviewed by the Center Director and by the Board of Directors, who apply the following criteria:

- "1. The academic/educational content must be of a high level; for example, the work should involve the development and application of advanced analytical techniques, or the improvement of existing technical standards. Where possible, the work should contribute to the development of new expertise within the Center.
2. The subject area must be consistent with the focus on technological and socio-economic development established by the Center.
3. The Center must possess the necessary staff and qualifications to perform the work outlined within the time frame and budget specified."

The current members of the Board of Directors possess an impressive amount of experience in conducting and administering research, both as individual researchers and as the heads of important academic and government organizations. For example, one member is a former Rector of Cairo University, former Minister of Education and Scientific Research, and former President of the Egyptian National Academy of Scientific Research. Five of the six have been involved with the program since its inception, and their long term commitment has been a strong factor in the Program's success. The Board, therefore, will insure that quality control is maintained. The establishment of criteria for quality control will evolve as more experience is gained.

While the evaluation team believes that the adoption and use of the above criteria is a definite and positive step in the development of the Center, there is the possibility that the criteria should be re-examined in the light of likely resource flows into the Center. At the present time the CU/MIT portion of Center activities appears to dominate in the development of projects. Furthermore, the CU/MIT program is largely limited to the expertise available, first at MIT and secondly at CU. While there is no doubt that the quality of that expertise is of the highest order, it nevertheless limits the response capacity of the Center at the very time that it may need to reconsider the need for expanding its client base for the purposes of securing needed resources.

At the present time there is no formal program for promoting the participation of other Egyptian universities. The limited involvement of other Universities which has taken place has occurred when Principal Investigators have identified appropriate individuals. The extent of this outside involvement is given in Table 6. No policy on patents for inventions resulting from the Center's work has been established. The evaluation team is satisfied that the management of the Center is continually soliciting funding from outside resources including the UN.

TABLE 6

INVOLVEMENT OF OTHER EGYPTIAN UNIVERSITIES IN CU/MIT RESEARCH PROJECTS

<u>Project</u>	<u>Other Universities Involved and Nature of Involvement</u>	<u>Potential Involvement</u>
Intercity Transportation	One faculty member from Assiut University is a paid member of the team.	Similar involvement expected
Stochastic Models of Nile Inflows to Lake Nasser	None	Alexandria - potential involvement in other projects to be con- ducted in the DRTPC
Water Resource Planning Models	Representatives from Ain Shams, Alexandria, and Assiut has participated in conferences. Zagazig has been consulted in water allocation study.	Similar involvement expected
Resource Development and Policy: Petroleum	One faculty member from Minoufiya University is a paid member of the team, chosen for special interest in petroleum and operations research	Similar involvement expected
Urban Infrastructure Alexandria-	None	Ain Shams and  potential involvement in other projects to be conducted in the DRTPC
Auto Production Planning	None	Potential for partici- pation by Ain Shams and Alexandria

APPENDIX I.

DRTPC FINANCIAL BREAKEVEN ANALYSIS

Projections Based on November 24, 1982 Final Draft Proposal  
All Figures in LE 000

CASE #1 ANALYSIS

1. Assumption

- (1) Total indirect costs are constant
- (2) Allocated Direct costs are escalated
- (3) Ratio of Fixed Costs is constant  $1185/1446^* = 82\%$   
Variable Costs

2. Background Numbers

1982/83

Total Cost Analysis

Indirect Cost	580
<u>Allocated Director Cost</u>	<u>605</u>

Total of Indirect and Allocated Direct Costs (DRTPC Fixed Cost)	1185
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+ Other Direct Cost (DRTPC Variable Cost)	<u>1446</u>
= Total Cost/Volume	<u>2,631</u>

Volume Distribution

AID	2551
<u>Other</u>	<u>80</u>
Total	2631

3. Case #1 Analysis

1982/83

1983/84

1984/85

1985/86

1986/87

Total Cost Analysis

Indirect Cost	580	580	580	580	580
<u>Allocated Direct Cost</u>	<u>605</u>	<u>640</u>	<u>675</u>	<u>700</u>	<u>735</u>
					<u>1,215</u>

Total of DRTPC Indirect and Allocated Direct (DRTPC Fixed Cost)	1,185	1,220	1,255	1,280	1,320
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+ Other Direct Cost (DRTPC Variable Cost)	<u>1,446</u>	<u>1,480</u>	<u>1,530</u>	<u>1,561</u>	<u>1,880</u>
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Total Cost/Volume	2631	2,708	2,785	2,841	3,200
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Volume Distribution

AID	2,551	2,286	2,039	1,083	0
<u>Other</u>	<u>80</u>	<u>422</u>	<u>746</u>	<u>1,758</u>	<u>3,200</u>
Total	<u>2631</u>	<u>2708</u>	<u>2785</u>	<u>2841</u>	<u>3200</u>

\*Assume that the source of the direct cost is mainly from USAID (1396) with only small amount (50) from other DRTPC projects.



APPENDIX II  
Projections Based on November 24, 1982 Final Draft Proposal

All Figures in LE 000

CASE #2 ANALYSIS

1. Assumptions

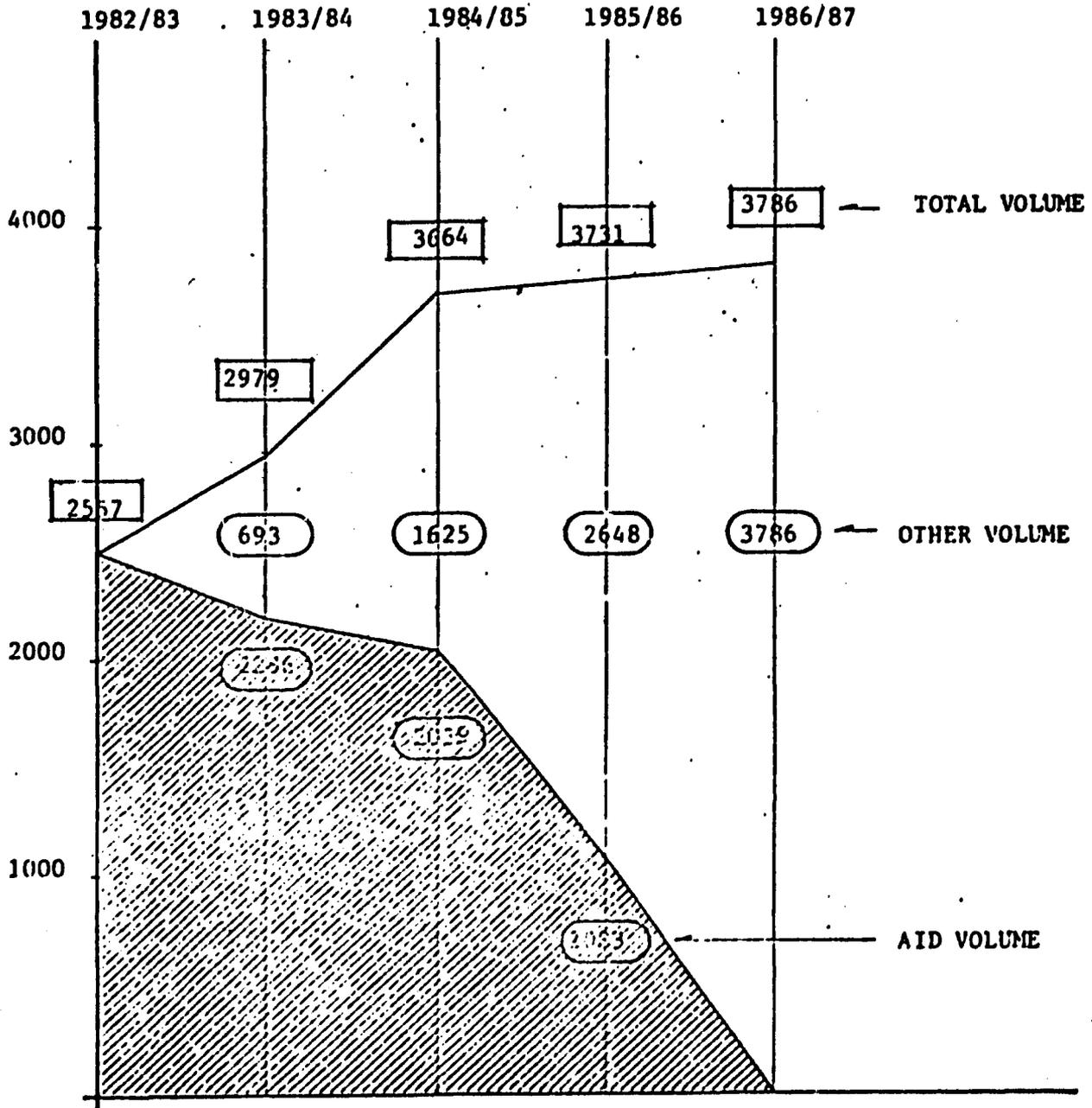
(1) Ratio of Allocated Direct Cost is constant = 30%  
Other Director Cost

(2) Indirect Costs are variable (30%)

2. <u>Background</u>	<u>1982/83</u>	<u>1983/84</u>	<u>1984/85</u>	<u>1985/86</u>	<u>1986/87</u>
<u>AID</u>					
Allocated Direct Cost	605	497	360	184	0
<u>Other Direct Cost</u>	<u>1,396</u>	<u>1,239</u>	<u>1,149</u>	<u>632</u>	<u>0</u>
Total Direct Cost	2,001	1,736	1,509	816	0
<u>Indirect Cost</u>	<u>550</u>	<u>550</u>	<u>530</u>	<u>267</u>	<u>0</u>
Total Cost	2,551	2,286	2,039	1,083	0
3. <u>Case # 2 Analysis</u>					
<u>Other</u>					
Allocated Direct Cost (30%)	0	123	277	470	672
<u>Other Director Cost</u>	<u>0</u>	<u>410</u>	<u>923</u>	<u>1,567</u>	<u>2,240</u>
Total Direct Cost	0	533	1,250	2,037	2,912
<u>Indirect Cost (30%)</u>	<u>0</u>	<u>160</u>	<u>375</u>	<u>611</u>	<u>874</u>
Total	0	693	1,625	2,648	3,786
Total AID Volume	2,551	2,286	2,039	1,083	0
<u>Total Other Volume</u>	<u>0</u>	<u>693</u>	<u>1,625</u>	<u>2,648</u>	<u>3,786</u>
Total Volume	2,551	2,979	3,664	3,731	3,786
Total Allocated Direct	605	620	637	654	672
Total Other Direct (AID)	1,396	1,239	1,149	632	0
<u>Total Other Direct (Other)</u>	<u>0</u>	<u>410</u>	<u>923</u>	<u>1,567</u>	<u>2,240</u>
Total Other Direct	1,396	1,649	2,072	2,199	2,240
Total Indirect Cost (AID)	550	550	530	267	0
<u>Total Indirect Cost (Other)</u>	<u>0</u>	<u>160</u>	<u>375</u>	<u>611</u>	<u>874</u>
Total Indirect Cost	550	710	905	878	874

\*From December 29, 1982 De Pass Memo.

CASE 2



APPENDIX III

Evaluation Team's Calculation of Research/Services  
Volume in the DRTPC Sufficient to Meet Core Costs<sup>1/</sup>

To gain insight into the rate and direction of DRTPC fiscal self-sufficiency, direct and indirect core costs were projected until 1986/87 (Table 1). Base year figures were provided by CU/MIT and modest inflation factors were used. Income from the CU/MIT Project was projected (Table 2) and differences between it and total core costs plotted until 1986/87. Table 3 projects total actual income stream and compares actual projected income to pound volume of research required to meet the short-fall in core costs. It was assumed that the DRTPC would charge a 30% overhead rate..

The projection of income from non-project sources is conservative and reflects no increase in the volume of DRTPC research; i.e., for all years LE 192,000 is used. We understand that the DRTPC is likely to have a substantially larger service portfolio and that part of it is currently being negotiated. Finally, Table 4 graphs total projected core costs, the difference between project core costs and projected income and the total volume of research that must be produced to generate enough overhead (at 30%) to meet projected core cost short-fall. In-kind contributions from GOE Ministries are not included in calculating income to be used in meeting DRTPC core costs. While important to the operation of joint research projects, they cannot be used to defray core costs at DRTPC. Furthermore, the projections do not deal with the use of surplus funds (i.e., income exceeds costs), but assume that such funds would be used to cover deficits in subsequent years or would be set aside as a reserve for "lean" periods.

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<sup>1/</sup> Core Cost = Fixed Costs

The graph suggests that the DRTPC will shortly face considerable resource constraints sufficient, perhaps, to thwart the perpetual institutionalization of the DRTPC. While not wishing to attribute absolute accuracy to the figures in the charts, the relationship between expenses and income is undeniable. While the evaluation team understands that new research contracts are in the offing, it is alarmed to note that from an existing level of non-project funded research of about LE 192,000 in 1982/3, income from non-Project research and services must increase approximately twenty-one times by 1986/87 (LE 4,200).

APPENDIX III

TABLE 1

DRTPC COSTS (Core)

NOTE: Base year figures from MIT proposal (000's)

<u>ITEMS/YRS</u>	<u>1982/3</u>	<u>1983/4</u>	<u>1984/5</u>	<u>1985/6</u>	<u>1986/7</u>	<u>REMARKS</u>
1. Staff <sup>1</sup>	LE 193	LE 208	LE 224	LE 240	LE 260	10% inflation p.a.
2. Direct Exp.	175	193	212	233	256	10% p.a.
3. Computer	267 <sup>2</sup>	125	84	41	42	From MIT (no inflation factor)
4. Dep Comp <sup>3</sup>	13	17	21	22	20	10 years
5. Library	50	55	61	67	74	10% p.a.
6. Dissem Conf	20	22	24	26	29	10% p.a.
7. Dep other	5	6	7	8	9	10 years
8. Proposals	<u>13</u>	<u>25</u>	<u>38</u>	<u>19</u>	<u>19</u>	Assumes 50% proposals not funded under contracts.
Total Direct	736	651	671	656	709	
Total Indirect	585	490	539	523	653	
Total Core Cost	<u>LE 1,321</u>	<u>LE 1,141</u>	<u>LE 1,210</u>	<u>LE 1,249</u>	<u>LE 1,362</u>	

- 
1. Include 10% P.A. inflation for most salaries; insurance costs calculated at different rate.
  2. The figure for 1982/3 is high because it includes an LE 100,000 one-time expense for the installation of a non-interruptable power supply to support the computer facility.
  3. Depreciation for furniture is contained in the indirect cost figures. No allowance for depreciating the computer or equipment appears to have been made in the new proposal.

APPENDIX III

TABLE 2

DRTPC INCOME FROM PROJECT TO MEET CORE COSTS  
(000's)

<u>Sources/Years</u>	<u>1982/3</u>	<u>1983/4</u>	<u>1984/5</u>	<u>1985/6</u>	<u>1986/7</u>	<u>REMARKS</u>
1. Direct Cost						
A. Charged to CU/MIT Conf.	LE 718	LE 522	LE 399	LE 203	---	
2. Indirect Costs to C.U.						
A. Charged to CU/MIT Conference	550	490	539	550	---	See H. MIT Proposal
Total Income from Contract for core costs. <sup>1</sup>	1,268	1,012	938	753	---	
Diff Project Income/Total Core Cost (Table I)	-53	-129	-272	-496	-1,362	

<sup>1</sup> Actual total CU/MIT Project funds available to the DRTPC are LE 2,551,000 for 1982/3, falling to LE2,286; LE2,039 and LE1,083 for the years 1983/4, 1984/5 and 1985/6, respectively. In the the above calculations, only those funds being applied to meet core costs have been used. For example, CU/MIT Project funds to support instruction are not used because the activity is to be totally paid for by clients in the future, just as it has been paid for out of Project funds. The cost of the Instructional Coordinator is allowed for in salary; core costs.

APPENDIX III

TABLE 3

EXPECTED INCOME SOURCES FROM ALL RESEARCH & SERVICES  
(000's) pounds

<u>Sources/Years</u>	<u>1984/3</u>	<u>1983/4</u>	<u>1984/5</u>	<u>1985/6</u>	<u>1986/7</u>	<u>Remarks</u>
I. CU/MIT Res	LE 566	LE 471	LE 377	LE 188	LE -	
Outside Res.	192	192	192	192	192	1982/3 Vol. Constant
II. 30% of I.	227	199	171	114	58	Assumes a 30% overhead rate on all res. contracts.
III. Computer Services	25	50	50	50	50	Assumes some non-research project service sold
Total Expected Income II & III	252	249	221	164	108	
Difference Between: Income/Amt. Required to Meet Total Costs (from Table 2)	+199	+120	-51	-352	-1,254	

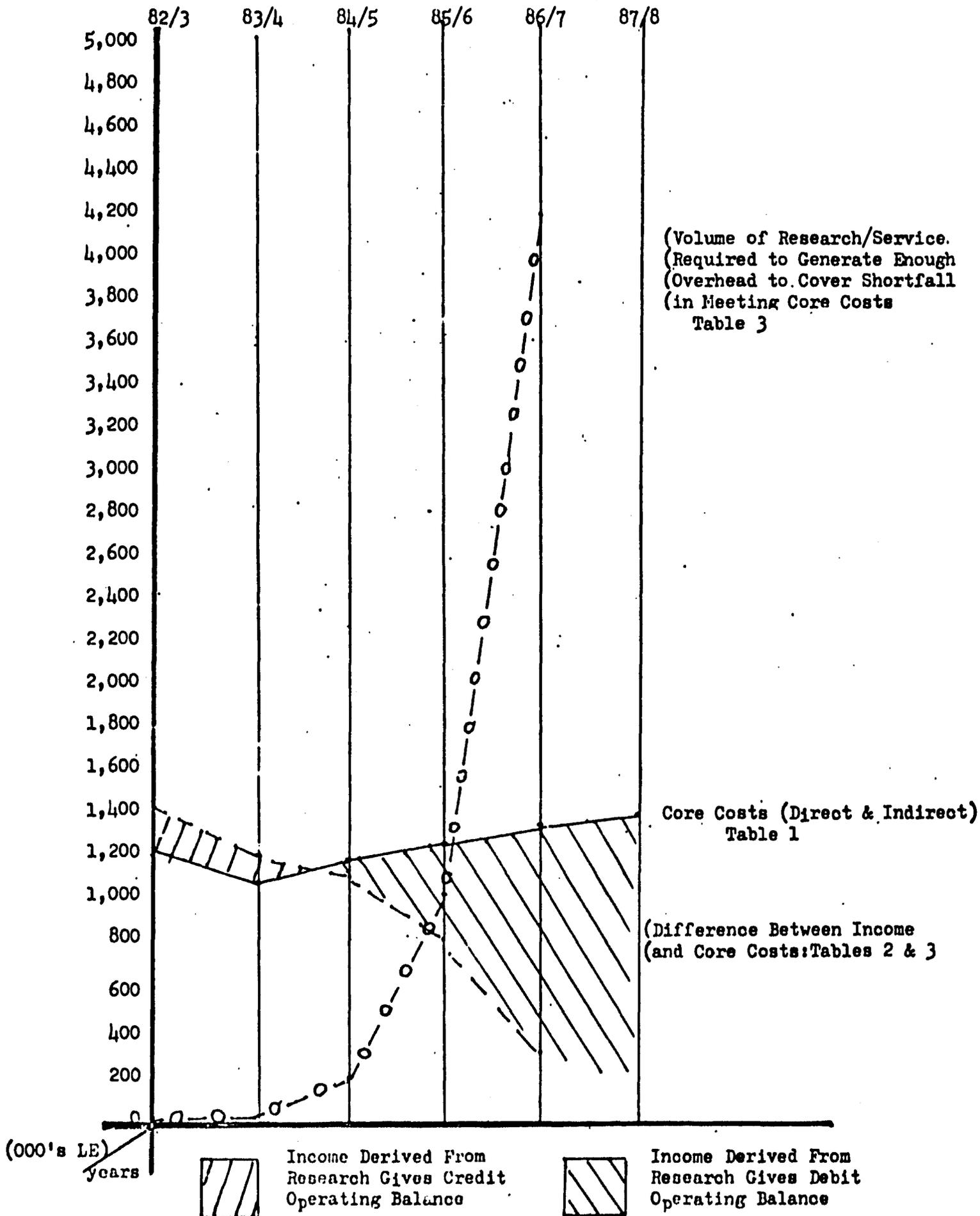
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LE Volume DRTPC  
research to meet  
short-falls <sup>1</sup>

	0	0	170	1,100	4,200
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<sup>1</sup>At 30% overhead.

DRTPC CORE EXPENSES/INCOME X YEARS



APPENDIX IV

DRTPC RESEARCH PROJECTS

<u>Project</u>	<u>Principal Investigator</u>	<u>Sponsored By</u>
Studies of the Central Nasr & Gesr El Suez Workshops	Dr. M. El Alaili Fac. of Engineering	Cairo University
Study of the Cement Market in Egypt	Dr. Atef Ebeid Fac. of Commerce	Egyptian Cement Office
Design & Mechanization of Financial and Managerial Systems of the Family Planning Organization	Dr. Abdel M. Mahmoud Fac. of Commerce	Family Planning & Population Agency
Education Information Systems	Dr. Ahmed Omar Fac. of Economics	Ministry of Petroleum
Replanning & Development of El Fayoum City	Dr. Taher El Sadek Inst. of Planning	El Fayoum Governorate
Study of the Sinai Society and its Structure, and Preparation of a Structural Plan for Sinai Peninsula	Dr. Sobhi Abdel Hakim Faculty of Arts Dept. of Demography	Ministry of State for Scientific Research
Structural Planning for El Amal City	Dr. Ahmed Yousry* Fac. of Engineering Dept. of Architecture	General Authority for Roads and Bridges
Optimum Policies for Maintenance of Delta Paved Road Network	Dr. Mohamed El Hawary* Fac. of Engineering Dept. of Public Works	General Authority for Roads and Bridges
Planning and Design of Youth Villages	Dr. Ahmed Yousry* Dept. of Architecture	Ministry of Housing & Reconstruction
Economy Wide Modeling & Social Accounting Matrix Updating Project	Dr. Amr Mohie-eldin* Fac. of Economics	USAID and the World Bank

\* Affiliated with CU/MIT Program

APPENDIX IV (Cont.)  
DRTPC RESEARCH PROJECTS

<u>Project</u>	<u>Principal Investigator</u>	<u>Sponsored By</u>
Employment of Women: Patterns and Demographic Change	Dr. Amr Mohie-eldin* Fac. of Economics	International Labor Organizations and United Nations Fund for Population Activities
Study of Manpower Demand at both Occupational and Sectoral Levels	Dr. Amr Mohie-eldin* Fac. of Economics	Ministry of Planning
Economic, Social and Cultural Characteristics of Egyptian Pilgrims (Hajj Project)	Dr. M. Zaki Shafei* Fac. of Economics	Pilgrimage Research Center University of King Abdel Aziz Jeddah, Saudi Arabia
Development of Pharma- ceutical Chemical System	Dr. S. Balbaa Faculty of Medicine	Ministry of Health
Performance of Paraffinic Asphalt-Cements in Road Construction	Dr. Abdelmoneim Osman* Faculty of Engineering Dept. of Civil Eng.	Central Authority for Roads and Bridges The Arab Contractors The Nile Company for Roads and Bridges El Nasr Contracting Co. The Nile Company for Road Construction The Nile Co. for Desert Roads The Nile Company for Construction and Paving
Guidelines for Urban Area Planning	Dr. Mohmoud Yousry* Faculty of Eng. Dept. of Architecture	General Organization for Physical Planning
Protection of the Open Railway Connection Serving Abou Tartour Phosphate Mines from the Danger of Floods	Dr. Halim Salem* Fac. of Engineering Dept. of Irrigation & Hydraulics	Ministry of Transport and Communications
Real Time Forecasting and Control of the High Dam	Dr. Halim Salem* Fac. of Engineering Dept. of Irrigation & Hydraulics	Ministry of Irrigation, Water Master Plan

\* Affiliated with CU/MIT Program

APPENDIX V

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Dr. Mustafa Kamel, Supreme Council of Universities  
Dr. G. El-Maghraby, C.U.  
Dr. Mohamed Fikry Mekkawi, C.U.  
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