

A REPORT PREPARED FOR USAID-EGYPT
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~~Final Report~~ A STUDY TO EVALUATE THE FEASIBILITY
OF TRAINING AND UPGRADING CRAFTSMEN AND
TECHNICIANS IN THE SEMI-SKILLED TRADES,
UNIVERSITY OF MINIA AND MINIA COMMUNITY, EGYPT.

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INTRODUCTION

PURPOSE

The purpose of this report is to describe a study performed during the period of November 18-24, 1977, Minia University, Minia (Middle Nile), Egypt. Specifically, the charge was to investigate the feasibility of USAID-Egypt supporting the implementation of a vocational-technical training project initiated by the University of Minia to train and upgrade craftsmen and technicians in suitable and pertinent skills in the Minia Community.

SCOPE OF WORK

The Scope of Work as outlined by USAID/Egypt, is as follows:

SCOPE OF WORK FOR DR. FRANK SCOTT, CONSULTANT FROM WESTERN MICHIGAN UNIVERSITY, DURING HIS ASSIGNMENT AT MINIA, EGYPT.

Dr. Scott is to conduct a survey at Minia to develop a descriptive profile of the existing system of vocational technical training, identify current and projected skills shortages by occupational area, and determine specific areas appropriate for USAID assistance, with priority designations. Both the public and private sectors, formal and non-formal, will be addressed in the survey, with focus on the following elements:

1. Structure of the system, showing organization from ministry level down through regional and local.
2. Statistical summary of data at all levels (students, teachers, resources, outputs, wastage). Enrollment 1970 through current; projections to 1985.
3. Quantitative and qualitative survey of teachers; impact of migration on staffing. Education and training system. Salary schedules.
4. Curricula at all levels.
5. Education technology (audio-visual facilities and materials, libraries, instructional materials and learning aids, textbooks).
6. Facilities (structures, shops, composition, distribution, maintenance levels, usage, wastage).
7. Shop and laboratory equipment (types, age, adequacy, appropriateness, condition, maintenance, use factors, needs).
8. Costs (priorities in financing, capital expenditures, recurrent expenditures, cost-student ratios, financing process).
9. On-the-job-training; training-within-industry.

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1. A complete itinerary of time spent on the project will be found in Appendix A, page 19.

THE NEED

Minia University, formerly an Institute of Higher Technology, invited USAID (in the Fall of 1976), to explore with the University's faculty of engineering, the possibility of turning the current engineering and shop facilities into a community oriented trade and skill center. Due to the "skill-drain" of craftsmen and technicians to other Arab nations (notably, Libya and Saudi Arabia), the need to train local citizens in a variety of skills ranging from automotive and tractor maintenance to radio repair and blacksmithing, would seem to be realistic. The request by Minia University is for USAID to help: 1) Evaluate these needs in terms of a manpower study; 2) establish training priorities; 3) renovate current facilities to meet these needs; 4) design appropriate curriculum and syllabi; 5) support such a program with financial aid to provide equipment, spare parts, materials, visual aids, texts and reference books, and funds for nominal teacher-training of potential leaders.

RECOMMENDATIONS

The study shows that both the human and material resources do exist to support and provide the momentum for such a project. There is a need for the training indicated, but it should first be documented by a manpower survey. Specific recommendations are made at the conclusion of this report and include: The development of a "plan" that spells out priorities; AID support in terms of a specialist to coordinate such a project, an Egyptian counterpart and project funds (approximately \$500,000); review of the University's engineering workshops and O.J.T.; and experimentation with the district Agriculture Department's "Ag-Equipment Garage" concept.

In conclusion, the project might become a model as to what other communities can do in terms of utilizing their own resources.

BACKGROUND AND HISTORY

There are several reports that have been written about the proposed Minia Project. These should be read by anyone not familiar with Egypt and specifically, Minia and its University. An alphabetical listing of these references will be found in Appendix B.

A brief history of Minia Community, the University, its faculty and the student body, might be appropriate at this time. Emphasis is placed on the Faculty of Engineering and Technology (hereafter referred to as F.E. and T.). The following represents some facts and specific information about the Minia Project-Engineering Faculty:

RELATED FACTS

- The Ministry of Education (M.O.E.) and the Ministry of Higher Education (M.O.H.E.) have the main responsibility for education and training. However, a number of ministries (Housing and Reconstruction, Industry

and Mineral Resources, Labor, Agriculture, and others) have their own skilled labor/technician O.J.T. (On-The-Job-Training) programs. There is a Higher Council for Manpower and Vocational Training (policy review, etc), but, generally, training among ministries is uncoordinated, very competitive, and often duplicative in nature. It is interesting to note that this may well be the way the Egyptians want it.

- Nearly sixty-one percent (61%) of the total labor force is illiterate and additional twenty-five percent (25%) is only able to read and write at a very nominal level of achievement. There are currently two Technical Teacher Training Institutes in Egypt. Trained vocational/technical teachers with industrial experience are scarce.
- The World Bank is presently in the process of expediting a plan to construct and equip some sixty six (66) vocational, trade, technical, teacher training and similar educationally oriented buildings. At present, Minia is not included in these plans. This represents a considerable undertaking and expenditure on the part of the World Bank.
- There is currently a severe "skill-drain" in the country; i.e., skilled manpower and technicians who have temporarily left Egypt for other Arab countries where the pay and opportunities are greater.
- There is a trend by the Central Government to decentralize authority and delegate it to the province, district, city, and village levels. Accordingly, communities with innovative leadership and resources are rapidly entering the training field in an effort to upgrade their own training facilities to meet severe labor shortages.

MINIA GOVERNMENT AND COMMUNITY

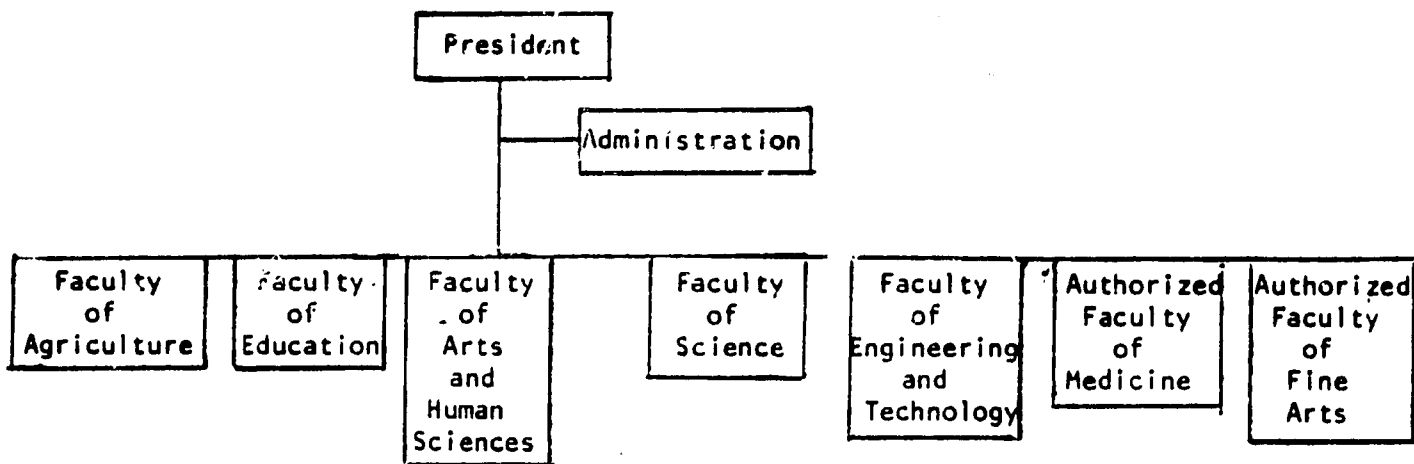
- Egypt is divided into Lower Egypt (Delta Basin), Middle Egypt and Upper Egypt (bordering on the Sudan). Minia is in Middle Egypt.
- The City of Minia is located 200 Kilometers south of Cairo, half-way to the city of Assiut.
- Minia Province, in which Minia city is the Capital, is composed of nine districts (one of the districts is known as Minia District). The province itself has a population of 2,000,000.
- Minia city has a population of 110,000.
- Twenty percent (20%) of the people in the province live in urban centers, the remainder are farmers living in rural villages.
- The area is basically agriculture with crops consisting of cotton, wheat, sugar-cane, beans, and onions.
- There are approximately ten (10) factories in the province, half in the

Minia District. The factories produce (process) cotton (ginning and spinning), cotton seed oil, soap, animal food, textiles, and cold drinks. Tourism is gradually beginning to open up.

- There is one Ministry of Education Industrial School (a trade school at the secondary level) in the Minia District. There is also a small School for the Disadvantaged for which UNICEF has donated some small tools. Cottage industries (less than ten employees) thrive, and range from rug making (family operated) to round-the-clock auto repair shops operating on the sidewalks of side streets.

THE UNIVERSITY

- Minia University, one of twelve Universities in Egypt, currently consists of five faculties and two more authorized. A rough organization chart would show:



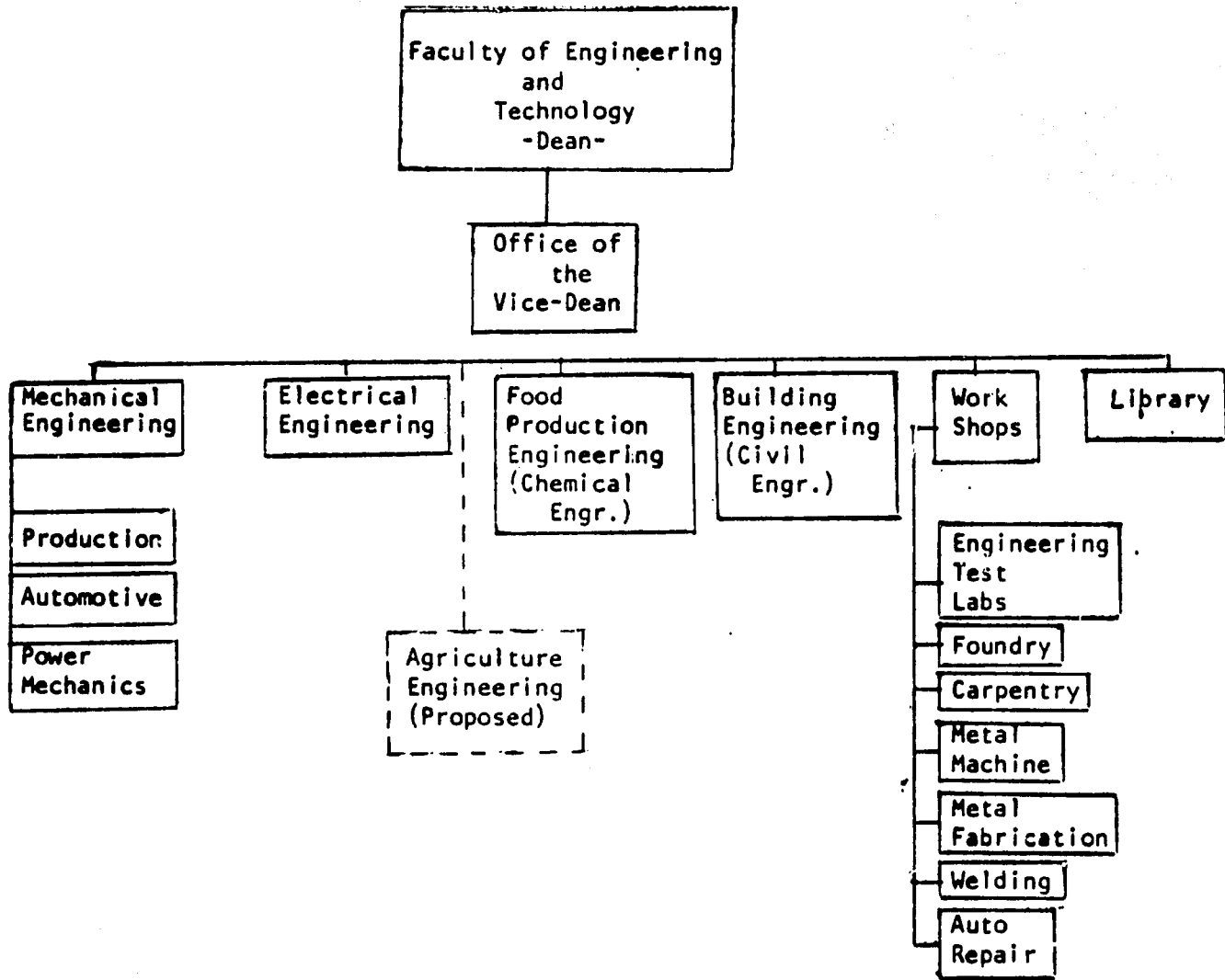
- The University was officially authorized in August, 1976. Prior to this, 1973-76, it was a branch of Assiut University.
- Originally (1972?) the school housed two Higher Technical Institutes, Agriculture and Engineering. Faculty from Assiut were recruited to act as part-time instructors.
- The main University campus is relatively centralized in the city of Minia. However, the faculties of Agriculture and Engineering are located off-campus, outside the city limits. The F.E. and T. is housed in a large, well designed building. The work shops and laboratories are grouped together in one end of the building. They are small in some cases, but with some redesign they could be made adequate enough for expanded utilization.
- There are approximately 10,000 students at the University and some 450 graduate students.
- There are roughly 500 teaching staff members of the combined faculties. About 100 of these hold a Ph.D. A significant number of the teaching faculty commute from the Universities in Alexandria, Cairo and Assiut, to compliment those residing on or near the campus.

THE FACULTY OF ENGINEERING AND TECHNOLOGY

-Faculty

Currently (November, 1977) the Faculty of Engineering and Technology (F.E. and T.) offers a degree in Mechanical Engineering with major options in Production, Automotive, and Power Mechanics. A plan to reorganize the faculty to better meet the needs of the Community has been approved by the President of the University. This reorganization should go into effect shortly after the new year. The F.E. and T. itself, is held responsible for the development of this reorganization, and corresponding curricula and syllabi.

The revised organization of the F.E. and T. would look something like the following:



The F.E. and T. currently consists of six professors, and some forty visiting professors assigned to assist the faculty from the University of Assiut, Alexandria, and Cairo. There are some sixty demonstrators (graduate assistants) assigned to the F.E. and T. In the workshops, there are approximately sixty instructors, working both as instructors and in "production".² Approximately half the F. E. and T. workshop instructors are involved in production. They manufacture such items as metal-welded bed frames, wooden head boards for these same beds, chairs and similar articles. The shops operate essentially half-time production and half-time instruction.

The quality of the F.E. and T. academic faculty is high. They are required to publish and maintain high standards of excellence. Research currently carried on is primarily of a "pure research" nature. "Applied research", as it relates to local industry, is minimal. If applied research is carried on by the faculty, it rarely has the support (backing) of local industry.

Turnover of junior faculty, lecturers and instructors is high -- reaching as much as 50% per year. Reasons for this high turnover among junior staff are: 1) Salaries offered in industry are generally more attractive; 2) the "brain-drain" to other Arab countries; 3) the desire to live in more sophisticated communities such as Alexandria and Cairo as opposed to Minia; 4) very limited housing, particularly for families.

On the other hand, many of the senior staff enjoy the opportunity for innovation, recognition, and personal achievement at the new University of Minia. The University is constantly growing and has a vigorous and imaginative leadership. These qualities are more than enough to forego the negative aspects previously mentioned for many of the senior faculty.

The instructors in the various workshops are usually graduates of the Ministry of Education Industrial Schools and have limited industrial experience. Some have been to Teacher Training Institutes. The engineer assigned to each shop area as its head seems to be well qualified and has industrial experience. However, the practical work experience of the instructors themselves is seriously questioned by the community and the industrial leaders in the Minia area. As is true in many developing countries, school and shop instructors working for the government are paid on a yearly basis and are not permitted to work their two to three months off in the summer, thus, losing an excellent opportunity to enhance their work experience in their particular skill(s) by working summers in local industry.

2. "Production" here refers to what most school shops in developing countries use as a manufacturing vehicle to make articles for both the parent educational institution and local community; i.e., chairs, beds, cabinets, castings, small machine parts, etc. The shops operate on a separate fund from normal school accounting classification; thus, funds collected are permitted to revert back to the workshops (instead of going to a general fund), to be spent as the shops so desire. Examples of expenditure might be new equipment, spare parts, books, tooling, maintenance, part-time instructor salaries, etc.

-Student Body

There are approximately 2,800 to 3,000 students assigned to the F. E. and T. Students are assigned to attend the University by the M.O.H.E. and come from all over Egypt--the majority, however, are from Minia district. Distribution of the engineering students by year is approximately as follows:

First year enrolled	800 students
Second year enrolled	700 students
Third year enrolled	600 students
Fourth year enrolled	400 students
Fifth year enrolled	<u>250</u> students

2,750/3,000 students

The students are 18 years old at entrance and are graduates of the country's secondary schools. Assignment to the Universities is by competitive examination and only the most promising go on to the Universities.

Students at Minia University have their own housing located near the University. It is known as the "City of Students".

-Curriculum

As mentioned before, curricula is standard throughout the country, but innovation and change within limitations are encouraged. The faculty of the University does have input into curricula change.

At present, the F.E. and T. graduates some 250 mechanical engineers per year. The local district(s) can absorb only half of these graduates at the most. Accordingly, it has been requested by the President of the University that the F.E. and T. diversify the curriculum offerings to better meet the needs of the community (see proposed reorganization chart, page 6.)

The F.E. and T. has two interesting innovations that apparently no other engineering faculty in Egypt has. One is workshop experience for the entering first year students. These students are scheduled to spend one day per week per academic year in the workshops, rotating from area to area to gain an introductory (explanatory) concept of manufacturing processes.

A second unique feature of the engineering students at Minia University is that during the summer break between the third and fourth year (three months), they are assigned to work in local industry as a learning experience. (An evaluation of both of these imaginative aspects of the F.E. and T. curricula will be found later in this report).

MINIA UNIVERSITY AND MINIA COMMUNITY:
A BEGINNING CONCEPT AND PLAN

It is not the purpose of this report to examine the philosophy, thinking, and plans of the University leadership as to their role in becoming a community-oriented University. The reports of Benedict, Salt, and Turner have summarized this very well. However, the implications of community involvement for the University's Faculty of Engineering and Technology, is pertinent to the report.

In a series of interviews and discussions with University personnel, a beginning understanding of the F.E. and T.'s role in community development began to form. These interviews and discussions were primarily with: Dr. Kamel, President of the University; Dr. Shawki, Dean, Arts and Human Sciences; Dr. Asfour, Dean, Engineering and Technology; and Dr. El-Geldowl, Vice-Dean, Engineering and Technology.

The following is essentially the thinking and planning of President Kamel as outlined in a discussion with myself and Drs. Asfour and El-Geldowl:

Minia University is the outgrowth of two former Higher Technical Institutes--Agriculture, and Engineering. These former institutes were staffed by Assiut University faculty. The Assiut University response to the request for teaching staff at the institutes was overwhelming. The visiting faculty did a good job, but their academic-orientation often resulted in their instruction being over the heads of the student body (who were not necessarily college prepared). The student body often found it difficult to understand the lectures. As a result, friction was apt to result between faculty and students. To compound this academic problem, the workshops, as the practical side of the institutes' curriculum, were not too successful in providing the students with the appropriate skills needed to gain employment upon graduation. Academically, the students that graduated were well grounded but their practical experience suffered. To try to make something better of a limited successful program, the M.O.H.E. decided to upgrade the institutes to a University--first a branch of Assiut University and then a chartered University in its own right. The new University was not just suddenly put together, but much careful planning went into its structure, organization, faculty, and curriculum. Its thrust on Middle Etypt, and particularly Minia district, was always kept in mind.

As previously explained in this report, the initial organization of the F.E. and T. included only Mechanical Engineering. It soon became evident that only a limited number of Mechanical Engineers could be absorbed in the immediate geographical area--a more diversified program in engineering was needed. As a result the offerings in engineering are being expanded to better meet the community's needs.

However, a series of problems still persist. The practical experience that the engineering workshops are supposedly supplying the first year incoming students is not too satisfactory. After ³ spending one day a week for an academic year in such shops, it is not too unreasonable to expect the students to demonstrate a knowledge of related science to manufacturing processes, realization of the impact of new technology on mechanical and electrical processes, equipment familiarization, standard maintenance procedure, and an acquisition of basic skills in welding, carpentry, machine shop, etc. Similarly, in terms of the summer work experience program, the summer O.J.T. of the third year engineering students has not proved to be the learning experience hoped for. A beginning understanding of applied manufacturing processes versus the theoretical version of such processes is still weak. Production and operation procedure, engineering design problems as related to production realities, and day-to-day economics of running a plant are still lacking in many of the graduates' practical knowledge.⁴ The concept of O.J.T. for engineering students is sound, it simply needs reexamination.

In defense of the F.E. and T., experienced and academically qualified shop instructors are nearly impossible to find, equipment is old, spare parts are difficult to find or make, and some material shortages do exist. Any attempt to emulate a straight-line production process, with the above deficiencies, would be very difficult to design and operate.

President Kamel explained that what he eventually envisioned was a separate vocational/technical institute to be housed in the current F.E. and T. building. A new site for the F.E. and T. on the main campus is presently in the planning stage but is still three to five years away. He would divorce such an institute from the F.E. and T., make it an entity in itself, and become close to a self-supporting unit, but still attached to the University. It would provide Minia district with a new environment for training and upgrading skilled tradesmen, technicians, and supervisors (foremen). Special short-term training in specific trades matched to identified community needs would be offered. Adult education and night school classes would be encouraged and promoted.

To make the proposed institute self-supporting, Dr. Kamel would initiate a "production" facility where equipment and parts needed by the University (and the community) to expand its physical resources could be manufactured.

³ These thoughts are the authors and not Dr. Kamel's.

⁴ These particular criticisms of the engineering schools' workshops and summer O.J.T. program are not the authors. They are the reactions and comments of a small but qualified sample of industrial leaders and craftsmen who hire the school's product--engineers.

Specifically, he mentioned wooden doors, windows, metal frames, hardware items, etc. Production lines could well be designed by advanced engineering students and their (student) input would be sought. *Similar production shops designed by engineering undergraduates have been successful in Turkey where the author spent some time as a technical advisor.*

In terms of the University competing with the existing M.O.E. Industrial School facility, Dr. Kamel was not too concerned. He felt there was room for cooperation but he planned to go ahead with his idea, whether he had the cooperation of the M.O.E. or not. He felt he had a responsibility to carry out, that Minia needed leadership and direction, and he meant to move ahead.

We, as a group, talked about how such an idea might be carried out. What were some specific plans? What procedures should be followed? Where should the priorities be placed? "Those are the very things," Dr. Kamel said, "that I need AID's help with--in analyzing the manpower needs of our Community, in redesigning the workshops, in deciding what additional equipment is needed, and just where the priorities rest."

Specifically, we discussed the following:

1. First, the University and the F.E. and T. need a plan. A plan to extend the training of skilled labor of both the University and the Community. A plan to upgrade current first year engineering students in their practical workshop experience. A plan to instigate a "production" side to the workshops. A plan based on the study of manpower needs and associated skill shortages.
2. Second, there is the need to examine, explore, and revise the design of existing workshops.
 - a. Training in the skilled trades including:
 - Carpentry
 - Welding
 - Mosaic Tiles, etc.
 - b. Agriculture maintenance:
 - Tractor overhaul and repair
 - Water pumps
 - Trucks etc.
 - c. Electrical repairs:
 - Refrigerators
 - Radios
 - Air Conditioners
 - d. Plumbing (and others)
3. Third, the plan would include:
 - a. Priorities based on money, time, and manpower (trainers).
 - b. The "how" to revamp curriculum
 - Trade and task analysis
 - c. The "when"
 - Time lines
 - Due dates
 - Completion dates

4. Fourth, but not necessarily in this order, would be equipment. To put the plan into effect we need equipment, materials, and supplies. Needless to say, the University would need financial support to carry out its plans.
 - a. The selection of equipment:
 - Price, availability, single-purpose or multi-purpose accessories
 - b. Visual-aids:
 - Mock-ups
 - Charts
 - Films on processes
 - "The Making of Steel"
 - "Oil Refining"
 - "Cotton Ginning, Spinning and Weaving"
 - c. Technical Library:
 - Up-to-date texts and reference books
 - "How-to-do-it" books
 - Operation manuals
 - d. Maintenance:
 - Spare parts
 - Care in maintaining new equipment
 - Manuals
 - Safety
5. Next, consideration might be given to training:
 - a. The trainers
 - b. Utilization of present instructors and faculty upgrading.

In summary, Dr. Kamel has given considerable thought to what is needed to make the present engineering shop and laboratories more effective. This was essentially a "brain storm" session, led by Dr. Kamel and involving all of us at the meeting.

EVALUATION OF COMMUNITY RESOURCES

THE SECONDARY INDUSTRIAL SCHOOL

A visit was made to the local, Minia City, Secondary Industrial School. The director of the school was both cooperative and sincere in his response to my questions.

There are 2,040 students in the school. It is a three year curriculum. Students enter after Preparatory School (grades 7-9), and are 15-18 years old while at the Industrial School (grades 10-12).

Course offerings consist of Machine Operations, Sheet Metal Fabrication, Welding, (Gas and Arc), Carpentry (Housing and Cabinet Making), Cement Work, Electrical, Plumbing, Automotive and Foundry. Students are placed, after graduation, by the Ministry of Manpower. The majority go to the construction trades, but most graduates have some option as to where they will work

The director feels that only half of the entering students are academically equipped to do the basic math, science, and communication skills required. Many have less than average mechanical skills. There is no real selection process--they are just assigned.

The instructional staff are generally graduates of special teacher training institutes. Teacher industrial experience is a luxury rather than a requirement. In the classes observed, the instructor-student ratio was reasonable, one to twenty, but equipment was old and work stations (lathes, presses, drills, etc), were at a premium.

The curriculum is dictated by the M.O.E. The syllabus for the various courses of study is old and long overdue for revision. Financial resources to make teacher salaries competitive with industry do not seem to be available.

Conclusion: The Industrial School is over crowded, inadequately equipped and needs attention. Shops lack a proper number of work stations so that all students can be actively engaged in projects and not stand around awaiting "their turn." The school's creditability with local industry for producing eager, well trained and intelligent potential employees is low. However, there is a cadre of instructors and a willing and honest director that should be considered in any program to upgrade the community's skilled trades and technology.

LOCAL INDUSTRY

Two industrial plants were visited while in Minia: a Cotton Spinning Mill and a Cotton Ginning Mill.

Cotton Spinning Mill (3,000 employees)

A very efficient, well run and tightly managed plant. An active and on-going P.M. (Preventive Maintenance) system was observed. Employee morale was seemingly very high--everyone was working at a better than standard pace. An incentive plan is in effect, employees work in teams, and production quotas are posted. Nominal safety rules were being observed (at least they recognized that there was such a thing as safety). Housekeeping was excellent for a plant of this nature. In all, a very favorable impression was made.

Cotton Gin Mill- (750 employees)

The Plant Manager and particularly the Chief Engineer were extremely innovative and creative. Work shops of the plant were most efficient and effective considering the age of some of the equipment (one Cincinnati lathe, ten foot bed, had to be over 35 years old and still operating better than some of the new Soviet bloc lathes brought in a few years ago). The workshops obviously can, and do, make just about anything the

plant needs to operate on. For example, the following items were observed as being made in the workshops: gears and cams, complicated housings, forgings, intricate conveyor systems, castings of difficult design, high grade steel machine parts, and similar difficult projects. The workshops housed a carpentry area, welding shop, foundry, machine shop, electrical maintenance shop, etc.

Conclusions: Both plants expressed the serious need for a better, more systematic means of training the new employees and upgrading craftsmen and technicians. Particular need was expressed to expose the craftsmen and technicians to the following: New technology in mass (repetitive) manufacturing techniques; the revolution in plastics; metallurgy technology; quality control sampling procedures; x-ray defraction for testing welds; instrumentation and automatic controls; solid-state electronics; MIG (GMA) wire-fed welding equipment; and many other similar new industrial techniques.

In both plants visited, the creditability of graduates of both the Industrial School and the University engineering program, were not necessarily held in great esteem. In one case (the Industrial School) it was a matter of a lack of ambition, willingness to learn and adjust to the world-of-work. In the case of the University graduate it was essentially a basic lack of practical knowledge, skills, and concepts vital to the design/production aspects of industry. The O.J.T. attempt to bring third year engineering students into the plant had not been too successful the plant personnel felt. Students did not seem interested in finding out for themselves "how things worked." They lacked the "questioning attitude." They appeared to be apathetic and more interested in working at a desk in an office than "on the floor" where the action is. (A situation incidentally, that Egypt has no monopoly on--it is world-wide!)

Supervisory (Foremen) training was also mentioned as a need. Such supervisory skills as methods and time study, quality control charts, safety, human relations (motivation), material handling concepts, and equipment maintenance, were areas mentioned in which supervision are in need of training.

In all, the visits were most gratifying and revealing. An air of enthusiasm and willingness by management to experiment was obvious. Both plants offer resources in both equipment and personnel to any community training project.

AGRICULTURE DEPARTMENT--MINIA DISTRICT

An interview was held with the Director of Agriculture (Local Government). He defined the farms in the area as being of two kinds: Private and Co-op Agriculture Associations.

In terms of training the farmers to maintain their tractors and other farm equipment, he felt the Private Sector was self-sufficient - they.

did their own training and they did it very well. The Co-op Agriculture Associations, however, are a different story. They need help. Many have virtually no idea how to read the manuals accompanying the tractors (trucks) let alone perform the necessary operations. Dozens (hundreds) of tractors and trucks are idle due to jammed transmissions, clogged fuel lines, broken steering mechanisms, worn bearings, and other difficulties too numerous to list. Spare parts are hard to get and very expensive.

The Director had a solution. He would like to see a series of central locations (perhaps one per each of the nine districts) where the farmers could come to be trained in how to maintain their equipment. Spare parts could be distributed accordingly and the costs to the farmers would be nominal. Engineers trained at the University and technicians (who were knowledgeable in automotive and combustion engines) could operate these Tractor Garages. Every one of the nine districts has available space, he thought, to house such an operation--no new buildings would be necessary. He felt that the engineers in charge and supporting technicians, however, would need special training in "how to teach." There would be a need to supply some equipment to make the garages operational--metal turning lathes, drill presses, welding equipment, storage bins, etc. Specifically, in terms of manpower to operate these garages, he felt the following manpower would be necessary:

- One (1) Engineer (Automotive trained)
- Three (3) Assistant Engineers (Automotive trained)
- Six (6) Technicians

Most tractors, at this time, are foreign made (Soviet Bloc) but a new surge of American Massey-Ferguson and International Harvester tractors are expected. However, there is an expanding plant in Helwan, (Nassar Company), that is currently making Egyptian Tractors. The mix is considerable but maintenance on the varieties of tractors would not be all that difficult he felt--the mechanisms of all types and brands were relatively similar.

Conclusions: Though the above idea does not necessarily fit the scheme of utilizing the University of Minia workshops as a central tractor overhaul base, it does have merit. It may want to be considered by AID. Regardless, the Director is thinking and it is an idea that might stand on its own merit or be incorporated with the general University concept of a centrally located Technical Institute.

MANPOWER: LEADERSHIP AND TRAINERS

Community resources include people as well as facilities. From the very limited exposure this consultant had to Minia University, it was obvious that the community (University, schools, industry, business and government) has a viable and vigorous source of potential leadership and citizenry interested in restoring to the community a nucleus of trained manpower as

craftsmen and technicians. For example, one very busy plant manager of a local industrial plant is already teaching part-time in the F.E. and T. He is interested in the engineering school, its direction, and what he may contribute as a practitioner.

Conclusions: Certainly the administration and faculty at the University are deeply committed to restoring the craftsmen and technology expertise needed to keep the community alive and progressive. The present building site of the F.E. and T. is suitable (with some physical changes) for a proposed Technical Institute. There is a cadre of instructors and industrialists that could initiate some skill training and be responsible for some of the instruction needed. In essence, the leadership would seem to be there, what is needed is some source to give such a project direction, coordinate it, and put its energy to use.

RECOMMENDATIONS AND CONCLUSIONS

RECOMMENDATIONS

The following are a series of recommendations that are made in regard to the purpose (objective) of this report as previously stated:

To investigate the feasibility of USAID-Egypt supporting the implementation of a vocational-technical training project initiated by the University of Minia to train and upgrade craftsmen and technicians in suitable and pertinent skills in Minia Community.

1. A manpower survey (plan) of needs in terms of trades, crafts, and skills in Minia Community should be implemented at the earliest possible date. Current, as well as future manpower needs, should be noted. Training centers, pupil output, and physical utilization should be identified and projections made based on data collected. Specific manpower needs and population growth should be documented. This is a considerable undertaking and will take time. (It is understood that such a survey has been contracted for and will be started in the near future).
2. Evaluate the manpower survey in terms of skill priorities, funds available (money), physical facilities, instructors (professional manpower) and time limitations. What are the priorities and what can be developed (programmed) for instant impact should be a prime consideration.
3. At this time, a decision should be made by USAID-Egypt whether or not to support such a project, as the objective of this report spells out. It is the recommendation of the author (consultant) that such support be affirmative, provided a systematic plan be developed in conjunction with those concerned.
4. It is highly recommended, but not mandatory, that a Community Advisory Committee be formed to establish a basic Plan of Procedure for the project and to follow the project to its completion. Membership of such a committee might include member(s) of the town council (Mayor or a representative), University personnel, industry/business representative(s),

craft union representative, one alumnus (engineering graduate) who is successfully employed, Industrial School principal, and an AID representative who would be an honorary (unofficial) member. The committee should be limited to twelve members.

- Suggested steps to initiate such a committee might consist of: election of officers; approval of Plan of Procedure; develop a schedule (with time allocations); establish financial needs to support such a plan; assignment of duties; and similar considerations to put the plan into effect. Such a committee should not only consider short range needs, but long term occupational needs as well. Where will the Minia Community be five, ten, and fifteen years from now? What skills will be important then? For example, what will be the community labor needs in the future for farm mechanization, factory expansion, transportation growth, farm irrigation, sanitary improvements, rural development (electricity), etc. What will be the training and manpower needs of the future as well as the present?
5. To facilitate the project an AID consultant(s) should be appointed. An Egyptian counterpart, preferably very familiar with the technical educational system of Egypt, should be assigned to work directly with said consultant. It is recommended that the following criteria be given consideration in hiring such an individual (AID consultant):
 - Skill in Conference Leadership and group dynamics.
 - Engineer or Engineer-Technician (teacher) by profession (or comparable work experience)
 - Knowledgeable in trade (task) analysis, curriculum development and laying out (redesigning) school shops.
 - Acquaintance with shop equipment, tools, materials, and supplies to outfit new school shops and labs.
 - Some background in school finance, purchasing procedures and equipment sources in the U.S.A.
 - Familiar with appropriate visual aids, library resources, (texts and reference books), and equipment manuals.
 6. It is suggested that a pilot (trial) program of one or two skills/trades in immediate demand, be implemented before too many programs be developed. Such a pilot program would afford an opportunity to evaluate community impact and acceptance, errors made and means of corrective action if any are required.
 7. Effort should be made to upgrade the Faculty of Engineering and Technology workshops. This would include student-project reevaluation, post teacher training (both in Egypt and the U.S.A.) and funds to support such a change (primarily the cost of equipment) and the cost to send selected participants to the states--both for long and short term training.
 8. Similar time should be given to reevaluate the O.J.T. that engineering students participate in with the local industries. A school coordinator should be assigned to supervise the training with the authority to reassign a student who is being exploited or receiving training of questionable value. The students should be paid a minimum wage while working. A written program of duties and assignments should be prepared and signed by a representative of the school, industry, and the student.

Conversely, if a student fails to meet his obligations and work standards set by management and previously agreed to, management should have the right to review and dismiss him/her accordingly. Students should meet collectively with management once a week (Thursday afternoon) to review their past week's experience, ask questions, and prepare for their final report. The co-op experience should receive the dignity of being a regular part of the curriculum and a grade and corresponding credit awarded.

9. Funding (AID support) for such a project at this time is impossible to assess. However, a rough figure for needed equipment, spare parts, materials, and supplies for the shop areas previously identified as needing help, may well take five hundred thousand dollars (\$500,000).
10. If AID-Egypt should decide to go ahead with the project, it may well want to consider transferring the control of the project to the Education Division.
11. It is highly recommended that the World Bank proposals be carefully reviewed by the Division. A liaison with the World Bank-Egypt should be established and mutual projects, concerns, and problems be periodically and continuously reviewed.
12. The Ministry of Education (MOE) and Ministry of Higher Education (MOHE) as well as any other ministries relevant to the project, should be kept informed of AID's intent, plans, and progress towards this project.
13. The proposal of the District's Agriculture representative to establish nine (9) "Ag-Equipment Garages" should be given consideration. Additional funding would be needed here.

Conclusions: The project has potential. Certainly it should be carefully evaluated as to AID's input once the manpower study is made; however, the results of such a study are rather obvious now in terms of what skills are in short supply and where training is needed. It is my recommendation that it be given further serious consideration--I believe it should be implemented. The building site is there, leadership in terms of imagination, enthusiasm, and drive mixed with experience, is anxiously waiting and a government willing to delegate its authority to local communities is in power. It could easily become a "pilot study" as to what one community utilizing its own resources could do working together and not encumbered by federal bureaucracy or educational ministries.

**APPENDIX A
AND
APPENDIX B**

APPENDIX A - ITINERARY: F. S. SCOTT,
NOVEMBER, 1977

Thursday, November 10 3:33 P.M. Depart Kalamazoo for Washington, D.C.

Friday, November 11 - Orientation (AID-Washington, Near East)

Ann VanDousan

Peter Benedict

- Sign Contract (AID-Contract Office)

Franklin H. Moulton

- Depart for Kennedy Airport and flight to Cairo

Saturday, November 12 - Arrive Cairo, 2:00 P.M.

Stay with DeButts for weekend

Sunday, November 13 - Orientation on Project: DeButts and Fitzcharles

Monday, November 14 - AID/Cairo Orientation

Dr. Stanley Applegate

Ms. Fitzcharles and staff

Mr. D. C. DeButts and staff

- Depart Minia (!)

Tuesday, November 15 - University of Minia Orientation

Dr. Shawki, Dean, Faculty Arts and Human Sciences .

Mr. Raafut, Graduate School and Guide

Dr. Farouk El-Geldowi, Vice Dean faculty of
Engineering and Technology

- Visit to local Industrial School

Mr. Fouad Sohinan Ali, Director

- Interview: Engineering and Technology Faculty

Dr. El-Geldowi

Wednesday, November 16 - Visit to Minia Government Agriculture Department

Mr. Farouk, Director

- Visit to Cotton Spinning Mill

Mr. Fahian Ibrahim, Director

- Interview: Dr. Hassnein M. Asfour, Dean
Faculty of Engineering and Technology

- Discussion: Engineering and Technology
continued, Dr. El-Geldowi

Thursday, November 17 - Visit Engineering Faculty Laboratories and Workshops,
Engineering Building

- Visit Cotton Gin

Mr. Softi, Director

Mr. Mohamed Elsulkari, Chief Engineer

- Interview; Dr. Abdel Kamel, President

Minia University (Drs. Asfour and ElGeldowi
also in attendance).

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Appendix A
Continued

Friday, November 18 - Visit to archeological sites
(Moslem Holiday) - Work on notes of visitations for report

Saturday, November 19 - Return to Cairo and AID Guest Home

Sunday, Monday, and Tuesday, November 20, 21, 22
- Moslem Holiday
- Researched, revised notes, and work on
rough draft of report

Wednesday, November 23 - AID-Debriefing of findings and recommendations to:
Dr. Applegate
Ms. Fitzcharles
Mr. DeButts

Thursday, November 24 - Return to Kalamazoo, Michigan (leave Cairo 7:00 A.M.
arrive Kalamazoo 10:00 P.M. - 22 hours intransit)

Monday, Tuesday, and Wednesday, December 18, 19, 20
- Work and finish draft of final report
- Rough typed

Friday, January 6, 1978
- Proof draft of final report--typed.