GEORGIA INSTITUTE OF TECHNOLOGY  
Engineering Experiment Station  

PROJECT INITIATION 

Date: February 1, 1974 

Project Title: "Stimulating Growth of Small-Scale Industry" 

Project No.: A-1600 

Project Director: Nelson C. Wall 

Sponsor: Agency for International Development, Department of State 

Effective January 10, 1974. Estimated to run until January 9, 1975 

Type Agreement: Contract No. AID/tc-c-1062 Amount: $100,000 

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Sponsor Contact Person(s): Mr. V. C. Perelli 

Contracting Officer 

Technical Assistance Branch 

Central Operations Division 

Office of Contracts Management 

Department of State 

Agency for International Development 

Washington, D.C. 20523 

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SMALL-SCALE INDUSTRY GRANT

ADMINISTRATION PROJECT

Grant Period: January 10, 1974 to January 9, 1975

A PROGRAM FUNDED BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
FINAL REPORT

STIMULATING THE GROWTH OF
SMALL-SCALE INDUSTRY

by

Nelson C. Wall

Project A-1600
Contract No. AID/ta-c-1062

Industrial Development Division
ENGINEERING EXPERIMENT STATION
Georgia Institute of Technology
January 1975
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INTRODUCTION

The Agency for International Development (AID) funded Contract No. AID/tac-1062 on January 23, 1974, through which the Industrial Development Division (IDD) of the Engineering Experiment Station at the Georgia Institute of Technology was charged with the responsibility of implementing a specific program of work in the area of "Stimulating Growth of Small-Scale Industry" by providing technical assistance grants to two counterpart institutions. The administrative portion of the contract was assigned the project number A-1600 by the contracting office at the Georgia Institute of Technology.

This is the final report of Year I of this project which has been implemented in two different geographic regions of the world. The two selected counterpart institutions were Soong Jun University, Seoul, Korea, and the Fundação Educacional do Sul de Santa Catarina, Tubarão, Brazil.

Following the contract guidelines, the following criteria were applied in selecting the two counterpart institutions:

1. Suitability of the national macroeconomic framework for local business conditions.
2. Existence of practicing or potential entrepreneurs.
3. Community concern over unemployment.
4. Existence of potential market for additional products.
5. Linkages (current or potential) with educational, financial, and business communities.
6. Quality of staff.
7. Institution's potential for utilizing grant effectively.
8. Potential multiplier effects.
9. Host government commitments.

After an extensive survey, which was funded by a companion project B-414 (AID grant 211(d)), of 11 countries (Bolivia, Brazil, Colombia, Ecuador, Ivory Coast, Indonesia, Kenya, Korea, Nigeria, Paraguay, and Thailand), the two institutions mentioned above were selected for this project.

Both institutions prepared and presented appropriate proposals which were established as two separate projects (B-426 and B-427) and which were each funded by a $45,000 grant provided for by Project A-1600.
Some of the immediate results of this project during the first year are the following:

**Project B-426 -- Soong Jun University (SJU), Korea**

1. Study of the trends of small-scale industries during the first half of 1974.

2. Establishment of the Small-Scale Industry Information Center (SSIIC).

3. Provision of on-site technical assistance to 18 small-scale industries in the area of Yongdung-po and Taejon.

4. Development of a simple test machine and tools for small-scale industries.

5. Presentation of training program to unskilled workers in 66 small-scale industries at the Yongdung-po Industrial Complex.

6. Training at Georgia Tech's Industrial Development Division of staff members of SJU.

7. Provision of consulting services by IDD staff in Korea.

8. Preparation of an industrial engineering curriculum for SJU.

9. Request to and authorization by the government of Korea for SJU to establish an industrial engineering curriculum at the university.

10. Preparation of an audiovisual documentation of the first-year program.

11. Establishment of a cooperative program between local industry organization and the university.

12. Formal interaction between SJU and many domestic as well as foreign organizations.

13. Research study on the population status of small-scale industries in the Yongdung-po area.

14. Completion of base-line data study during the project year.

**Project B-427 -- Fundação Educacional do Sul de Santa Catarina (FESSC), Tubarão, Brazil**

1. Establishment of the Basic Data Center (CDB) within the Department of Research and Development (DPD) at FESSC.

2. Establishment of the Center for Management and Technical Assistance (CETEG).
3. Establishment of the Community Development Center (CDC).

4. Training at IDD of three senior staff members of FESSC.

5. Provision of technical assistance services to 45 local small-scale industries.

6. Preparation and publication of one feasibility study.

7. Preparation and publication of an industrial expansion project.

8. Preparation and publication of two new manufacturing opportunity studies.


10. Preparation of an audiovisual documentation of the first-year program.

11. Training of over 2,500 persons through 112 training programs.

12. Participation in and contribution to the following development meetings or conferences:
   a. Third National Seminar of the Small and Medium Industry
   b. Regional Meeting on Human Resources
   c. Meeting of the Brazilian Institute of Technical and Management Assistance
   d. Meeting of the Brazilian Agro-Cattle Research Company

13. Completion of base-line data study during the project year.

14. Provision of consulting services by IDD staff in Brazil.

The sections that follow in this Year I final report describe in more detail the background, objectives, and general activities of the program. The report also highlights the results achieved and the conclusions reached by the combined project staffs.
Background

For the past 10 years, the Industrial Development Division (IDD) has had within its organization the International Development Branch which is responsible for the overseas activities of the division. In 1972, after a series of successful AID-sponsored projects in Latin America, the Industrial Development Division was awarded an AID 211(d) grant.

It was under this grant (Project B-414) that IDD identified the need for stimulating the growth of small-scale industries in Lesser-Developed Countries (LDC). In an attempt to respond to this identified need, IDD prepared a proposal under the title of "Stimulating Growth of Small-Scale Industry," which was submitted to AID for consideration on October 15, 1973. Early the following year (January 23, 1974), the proposal was accepted and funded by AID, and the administrative portion of the contract became Project A-1600 at the Georgia Institute of Technology.

The IDD staff had identified the general problems associated with the expansion and diversification of existing industries and the creation of new small industries in the following manner:

1. Lack of a systems analysis approach to providing research, services, and information to industry.
2. Insufficient funding to expand industrial assistance activities.
3. Continuing need for training of more organization staff personnel.
4. Lack of knowledge of pragmatic methodologies.
5. A deficient information base related to technical and management problems of small-scale industries.

The Industrial Development Division suggested a program that would attempt to cope with these problems. Some of the basic elements suggested in the proposal were:

1. An organization focus with clearly defined aims.
2. A well-trained and motivated staff.
3. An information base.
4. A technical assistance "delivery system."
When this program was funded by AID, Project A-1600 was created to serve as the "administrative project," and $45,000 grants were made to each of two counterpart institutions. Mr. Nelson C. Wall, Head of the International Development Branch, served as Project Director on A-1600.

The terms of the grants to counterpart institutions permitted the grantee to utilize half of the grant funds for personnel, travel, materials and supplies, conferences, etc. The balance of the funds were to be used by the grantee to obtain training and consultation from U.S. technical assistance organizations.

The Georgia Institute of Technology and the Technology and Development Institute, East-West Center, subsequently contracted with both grantees to provide training, consultation, and an audiovisual documentation of the projects.

The two selected counterpart institutions for this project may be briefly described as follows:

Soong Jun University. Soong Jun University was formed in 1970 when Soong Sil College united with Taejon College to form a new cooperative venture in the field of Christian education. Soong Sil College, in turn, was formed in Pyeng Yong (North Korea) in 1897 and reopened in Seoul in 1954, after being closed in 1938 during the Japanese occupation. Taejon Presbyterian College was founded in 1956 by the Southern Presbyterian Mission in the city of Taejon. At present, Soong Jun University has an enrollment of about 2,200 students, of which some 800 are in engineering.

The main campus is located in Seoul near the large industrial area of Yong-dung-po, which has a population of about 1.5 million inhabitants. The second campus at Taejon is also near a smaller industrial area with a population of about 450,000 persons. Recently, the government of Korea announced plans for the development of a new "science town" adjacent to the Taejon campus.

Immediately after Dr. Hahn Been Lee became president of Soong Jun University in March 1973, contacts were made by Mr. Ross W. Hammond, Chief of the Industrial Development Division, with Dr. Lee. As a result of these contacts, both institutions entered into an agreement of mutual cooperation on July 30, 1973.

Fundação Educacional do Sul de Santa Catarina. The Fundação Educacional do Sul de Santa Catarina (FESSC) is an autonomous entity, as established by the
Civil Code and National Legislation established specifically by the Decree Laws 200 and 900. It was constituted by Municipal Law Number 443-67 of October 18, 1967. It was recognized as being of utility to the Federal Government by Decree Number 70.680 of June 7, 1972.

FESSC has the following objectives: develop middle and higher education as required by the labor market, which is to be done by formal and informal course work; promote education and research related to the development of the State of Santa Catarina; and engage leadership and population in the process of self-promotion to develop the local and the regional areas.

From 1972 to 1973, enrollment in higher education (at present 10 programs) of FESSC increased from 350 to 1,200 persons, representing 32 municipalities. In 1974, there were over 2,000 students in nine programs of the middle education level as part of the integrated professional-educational system of the city. Through its multidisciplinary staff, with nine full-time technical persons, the Department of Research and Development (DPD) of FESSC had by 1974 been able to carry out 30 research projects and studies at the request of the public sector and private initiative, specifically in the areas of small and medium industries.

Objectives

The objectives of this program were clearly defined initially and they are threefold:

1. To encourage selected developing country organizations to focus on employment generation through programs which accelerate the expansion of existing industry and the creation of new small industries.

2. To demonstrate and document the impact of alternative approaches to the stimulation of small industry.

3. To create in the appropriate governmental industrial and financial sectors of small industry an awareness of potentials and ways to maximize these potentials.

The counterpart projects (B-426 and B-427) had their own specific objectives which coincided with the philosophy of the main objectives of this program. In order to meet the program's objectives, two main areas of activity were established by the project administration: 1) training of selected grantee staff members both overseas and in the U.S.A. at IDD and 2) providing
of on-site consultation by staff members of the Industrial Development Division. The participating IDD staff members were selected on their ability to provide engineering, scientific, and technical assistance to selected small-scale industries in both Korea and Brazil. All established objectives were met during Year I of the project.

**Total Project Goals**

The project goals for Year I were established in the AID contract with the Georgia Institute of Technology and may briefly be described as follows:

1. Select and recommend to AID/Washington, TA/OST, four Lesser Developed Country (LDC) institutions from different geographic regions as candidate institutions.

2. Carry out preliminary visits to the selected institutions to develop and establish patterns of collaboration.

3. After final selection, assist the grantee in preparing final plan for the utilization of the grant funds in a manner best suited to achieve the stated objectives.

4. Award the grant once this was approved by AID.

5. Provide consultation to the grantee during the planned activity period.

6. Monitor and evaluate project at least twice during the following 12-month period.

7. Assemble base-line data study at the start of the project.

The total project goals have been met during Year I, and the base-line data studies were completed and published under the following titles: *Base Line Data, Republic of Korea and Areas Served by Soong Jun University* and *Base Line Data, Areas of Brazil Served by Educational Foundation of South Santa Catarina*. Copies of both documents are provided under separate cover.

**Program of Work**

When the program of work was developed, it was designed with the intent to provide the counterpart institutions involved with the necessary latitude and freedom so they could design and implement meaningful programs of work to stimulate employment generation through native small-scale industries.
Under Project A-1600, the role of the Georgia Institute of Technology was that of administering the project, providing assistance to the counterpart institution in the development and design of the program, providing advice and counsel, and suggesting alternative options, all leading to the enhancement and assurance of positive results as established by the project goals.

The IDD staff then generated a suggested program of work to be considered by the counterparts as an illustration and to be changed by them during the planning and design process. The illustrative program was as follows:

1. **Counterpart Organization Functional Activities**
   a. **Organization.** The counterpart will administratively designate a unit to mount a program of research, service, training, and technical information for the small industry sector. Staff personnel will design the program based on the organization goals and motivations.
   b. **Facilities and Staff.** The counterpart will provide adequate office, equipment, and other resources to the designated units to permit its staff to function effectively. Staff personnel who have appropriate backgrounds and who, with appropriate training can implement the program of assistance, will be assigned to the unit.
   c. **Technology Transfer.** An information collection will be established by the counterpart where it does not exist to permit the staff to conduct research on industrial problems, needs, processes, and products, especially as they relate to small-scale industry, and to disseminate technical information.
   d. **Delivery System.** The counterpart will design and implement a procedure to permit direct contact with small industries and entrepreneurs for the purpose of ascertaining their needs and problems and for the provision of staff assistance and research in the solution of problems, both management and technical in nature. This industrial extension activity will have as its aim the expansion and diversification of existing and new industry.
   e. **Education and Training.** The counterpart will design and deliver appropriate training programs related to small-scale industry. Educational programs related to industrialization will be encouraged.
2. **Independent Continuing Activities.** A list of specific activities were offered in which the counterpart could engage as appropriate to his case.

a. **Research Activities**

- Preparation of case histories.
- Applied research on employment generation approaches.
- Evaluation of alternative methodologies aimed at accelerating industrialization and employment.
- Relationship of infrastructure development to industrialization.
- Economic planning strategies and alternatives.
- Analysis, evaluation, and development of new industrialization techniques and principles, products, and processes.
- Identification of appropriate manufacturing opportunities.
- Import substitution analyses and procedures.
- Export development considerations and potentials.
- Investigations of natural resource potentials.
- Production of market analysis and feasibility studies.
- Financing studies of small-scale industry.

b. **Industrial Extension Activities**

- Surveys of small industry problems and needs.
- Industrial problem-solving.
- Advice and consultation with industry.
- Provision of technical information to industry.
- Provision of management assistance to industry.

c. **Training Activities**

- Small industry operations.
- Industry-community interaction.
- Specific small-scale industry subjects.
- Problems and needs of small industry.
- Industrial processes.
- Identification of manufacturing needs.
- Market analysis.
- Feasibility studies.
- Plant location factors.
- Entrepreneur development.
- Financing of small-scale industry.
d. Educational Activities
At the option of the counterpart if it is an educational institution.

e. Training and Consultation
This assistance will be provided by the Industrial Development Division of the Engineering Experiment Station at the Georgia Institute of Technology as needed by the counterpart, either on site or in the U.S.A.
The training will take various forms as appropriate, including classroom work, on-the-job training, consulting and advising, plant tours, contacts with technical information sources, the provision of technological information, etc., both in the target area and in the United States.

On the basis of the outline suggested by IDD, the two counterpart institutions established the following programs of work:

1. Soong Jun University (SJU). A program of work was designed to implement the following activities during the 12-month period:
   a. Small-Scale Industry Information Center (SSIIC). The center was to be established during Year I of the program. It was to be the responsibility of the SSIIC to carry out surveys of small-scale industries in the two target areas and to generate the necessary basic data relevant to industry size, products, processes, major problem areas, and other governing factors. The center would also initiate a relevant collection of information from outside sources which would serve in the future as reference material. At the same time, the center would attempt to collect and disseminate management and technical information appropriate to the activities of small-scale industries. As part of the operation of the center, the gathered data would be cataloged, indexed, and stored in such a manner that it could be retrieved when needed.
   b. Industrial Training and Education. A specific short-term training program was to be established for staff members of SJU, in an attempt to enhance the capability of the counterpart staff in the area of "real world" problems common to small-scale industries. The training program could be carried out in various forms as appropriate, including classroom activities, on-the-job
training, guidance, consultation, industrial tours, and general business contacts, as needed. It was also planned to allow students to participate in this activity, so that they too could contribute to the development of the small-scale industries in Korea.

c. University Training and Education. It had been established early in the project that since SJU was a technologically-oriented institution, it would be desirable to assist it so that it could expand its engineering programs to include industrial engineering. This would in the future allow the SJU graduates to participate more usefully in the industrial development of the nation. It was further planned that during the first year a curriculum would be generated and that this would then evolve into an "academic program" to be instituted as soon as the proper government authorization could be obtained.

d. Industrial Extension and Research Activities. Through this fourth main portion of the program of work, a linkage would be made between SJU and the existing small-scale industries in the SJU area of influence. It was originally planned to provide technical assistance to small-scale industries through an industrial extension service system similar to the one presently in use by IDD in the state of Georgia. When needed, applied research activities would also be incorporated in this portion of the program.

2. Fundação Educacional do Sul de Santa Catarina (FESSC). FESSC considered the following specific activities as having the highest priorities and initiated these activities in a continuing program to the limit of available funds:

a. Implementation of Assistance for the Basic Data Center (CDB). FESSC possessed an incipient Basic Data Center within its Department of Research and Development. In that center, information of social, economic, and technological origin would be collected and classified to serve as a source of information to the activities of FESSC as well as entrepreneurs and organizations, both public and private. The systematic expansion of this center within its specialty of providing information to medium and small-size industries will be a priority activity within this project. The
following activities were considered necessary: the collection and identification of data to integrate a system which will allow interchange with IDD and other counterparts, both in the receiving of information and in the technology of new and innovative processes. Therefore, FESSC would utilize the appropriate space and staffing for this activity. The program would also provide for the specialization of the manager of this department, as well as provide assistance in the establishment of this center. The growth and acquisition of data and equipment will be established in the future so that microfilming and better processes can be implemented to be used by both parties.

b. Implementation of a Center for Management and Technical Assistance (CETEG). These activities have sporadically been carried out within DPD and, at this time, it was desirable to formalize a rationale for the future implementation of this service within the project. The center would be staffed with appropriate personnel, and a manager would be trained by IDD. It is to be an action organization in the areas of research, industrial extension, and training for small and medium-size industries and will be coordinated with the Center for Adult Education at FESSC.

c. Selection and Activities of Priority Communities. During the first year, three communities will be selected from the general areas of AMUREL (the Municipal Association of the Region of Laguna, made up of 16 municipalities) where the program of small-industry stimulation will be developed. The selection of these development poles will be through guidelines drawn from previous experience, and the activities will include the following: perform an audit and determine existing industries, raw materials, capital entrepreneurs, small industry problems, and other data; motivate the community leaders so that they will become involved in the project to expand existing industry and generate new ventures; and establish the necessary infrastructure within the community that will allow the successful development of these activities.

d. Study of Opportunities and Preparation of Profiles. A study will be conducted to identify within the universe of opportunities
those that are to be selected. This is to be done through pro-
files, new industrial projects, expansions, diversification of
existing activities, financial resources, and existing trained
manpower. These industry studies will be further developed in
the program. At this preliminary stage, and on the basis of
existing information and products, the following major areas of
interest are selected on the basis of past experience of FESSC:
1) Agro-industries:
   Planning and industrialization of papaws, citrics, peppermint,
garlic, onions, asparagus, brussel sprouts, mulberries, castor
oil, peanuts, mushrooms, and avocados. Industrial utiliza-
tion of algae, peelings of bitter oranges, and mink.
2) Chemical industries (appropriate for small and medium-size
   industries).
3) Mechanical industries.
4) Electric and electronic industries.
e. Training of Staff of FESSC. The staff training for FESSC, as
   considered by the project, will be done in the USA and in Brazil
   and in other areas of the world, if considered appropriate.

Details of the programs established by SJU and FESSC are described in the
following reports:

Yoon Bae Ouh and Nelson C. Wall. Soong Jun University Small-Scale
Industry Grant, Atlanta, Georgia: Georgia Institute of Technology,

Jose Muller and Nelson C. Wall. Fundação Educacional do Sul de Santa
Catarina Small-Scale Industry Grant, Atlanta, Georgia: Georgia

Use of Grant Funds

For the 1974-1975 grant year, each grantee was funded in the amount of
$45,000. Disbursement of these funds by SJU is shown in Table 1, and FESSC's
disbursements are detailed in Table 2.
### Table 1
DISBURSEMENT OF GRANT FUNDS  
SOONG JUN UNIVERSITY

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<td>GIT</td>
<td>TDI/E-W</td>
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<tr>
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\(^1/\) The GIT personal services include the authorized overhead and retirement charges.

\(^2/\) The contract with the East-West Center was for a total of $2,000 for the preparation of audiovisual material.

### Table 2
DISBURSEMENT OF GRANT FUNDS  
FUNDAÇÃO EDUCACIONAL DO SUL DE SANTA CATARINA

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<th>Total</th>
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<td>Materials and Supplies</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$22,500</strong></td>
<td><strong>$20,500</strong></td>
<td><strong>$2,000</strong></td>
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</tr>
</tbody>
</table>

\(^1/\) The GIT personal services include the authorized overhead and retirement charges.

\(^2/\) The contract with the East-West Center was for a total of $2,000 for the preparation of audiovisual material.
GENERAL ACTIVITIES DURING PROGRAM YEAR I

As indicated throughout this report, Project A-1600 was established as the administration project and the implementation was to be done under Projects B-426 and B-427. Because of this, it was considered desirable to structure this section to highlight some of the specific activities of SJU, FESSC, and IDD.

Soong Jun University

Under the B-426 project funded by A-1600 under the AID grant to the Georgia Institute of Technology, the staff at SJU carried out the following activities:

1. Description of Major Small-Scale Industries. During two quarters of the year, a study was prepared in an attempt to classify and describe the characteristics of Korean small-scale industries. The result of this activity was later incorporated into a separate report entitled Trends of Korean Small-Scale Industries During the Period 1974, which will be published by SJU early in 1975.

2. Small-Scale Industry Information Center. Once the information center was established, the SJU staff continued to operate it. They are at present increasing the collection while, at the same time, serving the needs of the SJU staff in the areas of management and technology. The collection has been classified into five major areas: (a) economic and statistical information, (b) professional material, (c) official material, (d) directory material, and (e) technical information.

3. Industrial Files. In order to achieve maximum effectiveness in the area of management and technical assistance, the Integrated Development Center (IDC) has developed a file system so that they may retain copies of all technical-management problems that are covered by the staff. All companies, at the time they request service, must complete a standard form which is later filed for future usage. This allows the SJU staff to be able to answer questions instantly by phone or letter when they receive additional service requests from the registered enterprises. The forms also are being used in the basic research being conducted in the area of surveying the small-scale industries in Yongdung-po and Taejon.

4. Technical Assistance to Small-Scale Industry. This has been the most demanding portion of the program. During the year, the SJU staff serviced 18 industries in either Yongdung-po or Taejon. This represented some 78 visits by staff teams, and about 183 persons were involved to provide well over 200
hours of technical assistance. A complete listing of companies serviced and a description of each case is presented as part of the final report for Project B-426.

5. Development of Testing Equipment and Industrial Tools. In the process of providing the necessary technical assistance to the industries in Yongdung-po and Taejon, the SJU staff identified the need for certain testing machines and industrial tools. The staff took it upon itself to develop a low cost test machine to be used in determining the tensile strength of moulded metal parts.

During the provision of technical assistance to a manufacturer of small metal parts for handbags, another problem was encountered which was solved by designing and fabricating a simple shaping die. This industrial tool was also developed by the SJU staff and given to the company being serviced.

6. Technical Training for Unskilled Workers. A program was established by the SJU staff to provide technical training for unskilled workers in small-scale industries in the Yongdung-po Industrial Complex. The first program was presented during the period of October 11 to October 19, 1974. Five staff members were responsible for the instructional material and 40 persons participated.

7. Industry-University Cooperative Committee. In order to further unite the bonds between SJU and the companies that received technical assistance under this program, the Integrated Development Center created the Industry-University Cooperative Committee. Those companies that have implemented the recommendations made by the SJU staff and have achieved some success because of it are invited to join this committee. Membership cards are issued as well as certificates. At present, five companies have been awarded the certificate.

8. Administration and Linkages. When the project was initiated, an organization was in existence. Over the year, the administration at SJU has changed the organization so that specific administrative units could be established. At present, these new units have the responsibilities of research, training, education, information service, and industrial extension.

As part of the project, SJU set up linkages with other institutions interested in small-scale industry development such as the Asian Institute of Technology, Asian Productivity Organization, Technology and Development Institute (East-West Center), and all the counterpart institutions working with IDD.
9. **Base-Line Data.** The staff at SJU was of great help to the IDD staff in the preparation of the necessary base-line data on Korea. The completed report is presented under separate cover.

**Fundação Educacional do Sul de Santa Catarina**

The companion Project B-427, also funded by Project A-1600, was implemented by the highly motivated staff of FESSC. For Year I, the following are representative of their activities:

1. **Establishment and Operation of the Basic Data Center (CDB).** Three persons of the FESSC staff are at present operating this center -- two are senior members of the staff and one is a junior member. Mr. Marcos T. Hemkemeier, Head of the Center, has an academic background in economics and statistics. The center suffered a serious setback in March, when part of the collection was lost as a result of a flood. The staff has since reconstructed the center and it is now in full operation. During the year, the following activities were also carried out:
   a. Registration of existing periodicals.
   b. Preliminary listing of existing bibliographies.
   c. Initial cataloging of local industrial enterprises.
   d. Initial classification of bibliographies.
   e. Continued collection of relevant newspaper clippings.

2. **Center for Management and Technical Assistance (CETEG).** The staff at this center, under the direction of Mr. Humberto Dalsasso, has quickly moved forward into the area of providing technical assistance to small and medium-scale industries. As indicated in the B-427 report, the staff at CETEG was able to provide technical assistance to 45 industries during the year. It is important to recognize the fact that the staff at CETEG is responsible for a geographic area of 9.5 thousand square kilometers, encompassing 32 municipalities forming two micro-regions called AMUREL and AMSESC.

3. **Adaptive Technology Center (CATT).** This is the newest of the administrative units established during Year I of the program. This unit will in the future review existing "foreign" technology and attempt to adapt it for use by local small-scale industries. While it may take several years before this endeavor is "on stream," this is the only institution in South Brazil that is presently willing to attempt to do this.
4. Community Development Center (CDC). This center was established and funded by the FESSC administration in an attempt to develop the different communities in the target area. Although not an integral part of this project, this center, together with the Center for Bio-Medicine (CMBS), was developed with the objective of better serving the population of South Santa Catarina. Both of these units played a very important role during the emergency period following the March 1974 flood.

5. University Training and Education. The academic staff at FESSC has now been working for the past nine months in the development of an "academic program" that would provide higher education to students in the field of industrial engineering. The final "academic program" proposal will be submitted by FESSC to the Minister of Education of Brazil. If approved, the program will be presented to FESSC students as part of the yet-to-be-created Department of Industrial Engineering. It is anticipated by FESSC authorities that the required authorization will be issued early in 1975.

6. Industrial Training and Education. Early in the program year, it was planned that members of the FESSC staff would go to IDD headquarters in Atlanta for special training. It was anticipated that the participants would be in Atlanta by fall 1974 but, due to the March flood, the dates had to be changed. On January 6, 1975, three participants started a six-week training program at IDD which was presented in Portuguese to facilitate instruction.

As part of the industrial training and education activities, the staff at FESSC established the Center for Continuous Education (CEP) designed to provide special training to workers and the public in general. During the past year, the CEP presented 112 training programs and had over 2,500 participants complete the training programs.

7. Emergency Program. In an effort to assist the public in general and the industrial community in particular following the March 23-25 flood which covered 90% of the City of Tubarão, the FESSC staff established an emergency program which used all available manpower at that time. In general, the following public services were performed by volunteers from FESSC:

a. Team of three persons to work in the central area.

b. Team of three persons to locate in the AMSESC area.

c. Team of four persons to locate in the AMUREL area.

d. Preparation of reports suggesting priorities for the disaster areas.
e. Preparation of reports establishing the housing needs for the areas.
f. General community reconstruction projects.
g. Studies to determine the material losses caused by the flood.
h. Innoculation of vaccines to 65,000 persons.
i. Emergency saving of 18 lives and participation in 2,000 emergency cases.
j. Assistance in food and clothing distribution.
k. General counseling and assistance to local and federal authorities.
l. Reconstruction of FESSC after a material loss of well over one quarter million dollars.

It is significant to note that although the work was carried out as part of the B-427 project, FESSC did not use any of the project funds for this activity. The emergency program was funded internally by FESSC and other administrative units of the government of Brazil.

8. Internal Organization. As the project evolved, so did the internal organization. By the end of the year, the counterpart project director had modified the structure from the original to a more viable organization which corresponds to the present needs of FESSC and the Department of Research and Development.

9. Base-Line Data. The FESSC staff worked together with the on-site IDD staff to generate the necessary information for the preparation of a base-line data report on the area of Tubarão. This document is presented under separate cover.

Industrial Development Division (IDD) and Technology and Development Institute

Both Soong Jun University and Fundação Educacional do Sul de Santa Catarina utilized one half of their grant funds to obtain training and consulting assistance from the Georgia Institute of Technology and assistance in developing documentation of the projects from the Technology and Development Institute at the East-West Center in Hawaii.

Under these contracts with the two institutions, many members of the Georgia Tech staff were assigned to carry out individual tasks with the two counterpart institutions. A brief listing of the individuals involved follows.
1974
March 4 - March 8
April 3 - April 16
April 3 - April 10
April 28 - June 14
June 28 - July 6
August 16 - September 19
August 16 - September 19
September 8 - October 13
September 29 - October 13
December 7 - December 19
December 12 - December 18

Name
Ross W. Hammond
Nelson C. Wall
Richard Johnston
Ben James
George A. Morelos
George A. Morelos
Phil Potts
William Studstill
Ross W. Hammond
George A. Morelos
Nelson C. Wall

Country
Brazil
Korea
Korea
Korea
Brazil
Brazil
Brazil
Korea
Korea
Brazil
Korea

During Year I of the program, two audiovisual case histories were filmed. Both SJU and FESSC contracted with the East-West Center of Hawaii for the filming of this videotape and photographic record to document the activities of the project and initiate an audiovisual case history. Mr. Fred Burian of the East-West Center staff traveled to FESSC and SJU to do the actual on-site filming of the tapes and photography.

Copies of the videotapes, as well as a collection of photographs, are available to the sponsor and to other interested organizations. The audiovisual material is considered an integral part of this report.
RESULTS AND CONCLUSIONS

In the introduction of this report, it was indicated that many positive accomplishments had resulted from the Year I program of Project A-1600, B-426, and B-427. This section will briefly outline the results of the year's activities and summarize the conclusions of the project staff.

Results of Soong Jun University Program

1. On May 9, 1974, there was a ceremony between Yongdung-po Industrial Complex companies and SJU. The purpose was to establish relationships between local industry and the SJU program. On June 4, a similar ceremony took place at Taejon between the Taejon Chamber of Commerce and SJU. Both of these ceremonies were used as reference at a later date by President Park as an example of university-industry interaction.

2. The staff at SJU was able to prepare a study entitled Trends of Korean Small-Scale Industries During the Period 1974. This research study will be published by SJU early in 1975 as indicated before. The study looks into the characteristics of Korean small-scale industries and attempts to classify and describe the different types of small-scale industries that were surveyed.

3. The Small-Scale Industry Information Center (SSIIC) was established as a viable part of the first-year program. The center, which is presently in operation, has initiated the first serious collection of relevant industrial data in Korea. Not only is the center a depository of industrial data, it is also attempting to generate information valuable to future small-scale industrial programs.

4. The staff at SJU provided well over 200 man-hours of direct technical assistance service plus nearly 100 man days of IDD staff time to small-scale industries in the area. As a result, 18 small-scale industries were serviced and their specific problems were resolved.

5. Simple testing machines and industrial tools were designed as part of a technology application or adaptive technology effort. Two main accomplishments should be mentioned: (a) the design, construction, and application of an inexpensive tensile tester; and (b) the design, construction, and application of a simple die or industrial tool.
6. IDD presented a meaningful training program especially designed for the senior staff at SJU. This was the first of a series of training programs to be offered during the life of this project.

7. The SJU staff trained about 40 unskilled laborers in the Yongdung-po Industrial Complex.

8. Consulting services were provided by the IDD staff. Besides the time utilized in the provision of technical assistance to small-scale industries, the IDD staff also provided on-site consultation in such areas as curriculum planning, project development, project administration, operations, logistics, report preparation, and many others.

9. An industrial engineering curriculum was developed. Although this activity was funded under IDD's 211(d) grant, it was the first step toward the establishment of the Department of Industrial Engineering as part of the College of Engineering. As a direct result of this effort, the Ministry of Education authorized the establishing of the Industrial Engineering Department at SJU late in December 1974.

10. An audiovisual history of the program was prepared by the East-West Center. The resulting videotape and photographic collection provide a concise history of the highlights of the program of technical assistance to small-scale industries in both Yongdung-po and Taejon.

11. The staff at SJU spent much time compiling demographic and industrial data on selected areas of Korea, as well as conducting research studies on small-scale industries in the Yongdung-po area. These studies will be published by SJU at a later date.

12. During the program year, internal organization changes evolved and, as a result, a new organization structure had emerged by the end of the year. It is significant to note that this was accomplished totally by the SJU staff as they went further into the program year.

13. During the grant year, both the SJU staff and the IDD staff had the opportunity of working together and getting to know new problems which needed solution. The knowledge gained of real world problems and solutions will be of direct value in staff development and in feedback to the university education curricula.
Results of the Fundação Educacional do Sul de Santa Catarina Program

1. The FESSC/IDD staff, working with the Department of Research and Development (DRP), the Center for Adaptive Technology (CATT), and the Center for Management and Technical Assistance (CETEG), was able to provide technical assistance to 45 small and medium scale industries in four municipalities in South Santa Catarina.

2. Through this program, the staff at FESSC was able to prepare an "industrial expansion" study for a local industry. The study was published under the title, "Industrial de Doces Aurea -- Projeto de Expansão Industrial." The study was prepared for Nicodemos Philippi and Cia, which is now implementing the project. The expansion will allow the company to produce 700 tons per year (at 80% of production capacity) of assorted jams, jellies, and sweets. The expansion represents an additional investment of about $100,000 and will provide direct employment to 18 local persons. All financing has been provided by local banks.

3. The FESSC staff also completed and published two "new industry" studies for interested investors -- Fabrica de Carrocerias Basculantes for the Creso Tauares & Cia. Ltda. and Fabrica de Tijolos e Correlatos for Cerâmica Itapoa Ltda. Both of these new industries are now being established by the corresponding entrepreneurs. The first case will represent an investment of about $200,000 and will have a direct employment of 30 persons. The second case represents an investment of about $130,000 and will employ 23 local persons.

4. Another study prepared by the FESSC staff during the year is a feasibility study which was published under the title Regeneração de Borracha -- Projeto de Viabilidade. The results of the study are still under consideration by interested investors.

5. The Basic Data Center (CDB) was established early in the project year. After the March flood, the center was rebuilt by the FESSC staff. At present, the center is operational and has proven to be of great value in providing the necessary data for the four studies mentioned above.

6. Both the Community Development Center (CDC) and the Adaptive Technology Center (CATT) were also established during Year I of the project. The CDC is at present gathering information on the communities in the two micro-regions.
of AMUREL and AMSESC. The staff is systematically carrying out community audits in these two areas. The Adaptive Technology Center is just starting operations and no major results are anticipated until Year II of the project.

7. Three senior staff members of FESSC, Mr. Humberto Dalsasso, Head of CETEG; Mr. Marcos Hemkemeier, Head of CDB; and Mr. Adalgiso Domingues, Head of CATT, are completing their training program at IDD in Atlanta, Georgia. When the team returns to FESSC, they will be able to better assist in the performance of project tasks.

8. Through the Center for Continuous Education (CEP), over 2,500 persons were trained by the project staff during this year. This activity has been very well received by both the local population and the industries of the area.

9. The staff at FESSC spent much time compiling relevant demographic and industrial data on the area they serve. They also compiled a card index of all industries of the area, which eventually will be used in the preparation of a manufacturing directory.

10. During the program year, the administration at FESSC noted the deficiencies of the existing organization and evolved it into a more viable one. This activity was totally carried out by the FESSC top administration.

11. An audiovisual history of Year I was completed, base-line data of the area were compiled and published; contributions were made to newsletters, and a curriculum for industrial engineering was developed.

12. FESSC staff members contributed and participated in four development meetings or conferences during the year.

Despite the detrimental factors imposed on the project by the March 1974 flood, all project commitments were met during the program year.

Conclusions

During Year I, the administrative contract (A-1600) and the two associated contracts (B-426 and B-427) have assisted in the establishment of units in two developing countries that are specifically interested in the generation and the expansion of small-scale industry. These newly created units are now beginning to implement action-oriented, pragmatic programs in the areas of applied research, technical service, technology adaptation and transfer, and industrial training and education.
The results have been even greater than anticipated, and both counterparts are for the first time serving the industrial base of their developing areas. The vast majority of the work has been carried out in rural areas with small industries and, as a result, low-income groups are being benefited.

Both counterpart institutions are anxious to continue growing in this area as indicated by the Year II proposals that were submitted to the sponsor earlier this year.
SMALL-SCALE INDUSTRY
GRANT
YEAR II

STIMULATING THE GROWTH OF
SMALL-SCALE INDUSTRY

Grant Period: January 10, 1975 to January 9, 1976

A PROGRAM FUNDED BY THE U.S. AGENCY FOR
INTERNATIONAL DEVELOPMENT
FINAL REPORT
YEAR II

STIMULATING THE GROWTH OF
SMALL-SCALE INDUSTRY

by
Nelson C. Wall

Project A-1600
Contract No. AID/ta-c-1062

Economic Development Laboratory
ENGINEERING EXPERIMENT STATION
Georgia Institute of Technology
February 1976
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INTRODUCTION

On January 23, 1974, the Agency for International Development (AID) funded for the first time Contract No. AID/ta-c-1062, through which the Economic Development Laboratory (EDL) of the Engineering Experiment Station at the Georgia Institute of Technology was assigned the responsibility of implementing a specific program of work in the area of stimulating growth of small-scale industry by providing assistance grants to counterpart institutions. The administrative portion of this AID contract was assigned the project number A-1600 by the Georgia Institute of Technology.

A second consecutive year was funded by the sponsor agency on January 31, 1975. This is the final report for Year II of this project, which has been implemented in two different regions of the world and initiated in a third geographic location. The three funded counterpart institutions for Year II were: Soong Jun University, Seoul, Korea; the Fundação Educacional do Sul de Santa Catarina, Tubarão, Brazil; and the University of Ife, Ile-Ife, Nigeria. The basic AID contract eventually may be funded to include up to four counterpart institutions.

In selecting the two original counterparts during Year I and the third counterpart in Year II, the following criteria were followed as indicated by the contract guidelines:

1. Suitability of the national macroeconomic framework for local business conditions.
2. Existence of practicing or potential entrepreneurs.
3. Community concern over unemployment.
4. Existence of potential markets for additional products.
5. Linkages (current or potential) with educational, financial, and business communities.
6. Quality of staff.
7. Institution's potential for utilizing grant effectively.
8. Potential multiplier effects.
9. Host government commitments.

The results of the first-year program were published at the end of the grant year. For additional details, refer to Nelson C. Wall's report, Final Report--Stimulating the Growth of Small-Scale Industry (January 10, 1974, to
At the start of Year II, only two counterparts were funded—Soong Jun University and the Fundação Educacional do Sul de Santa Catarina—but midway through grant Year II, funds became available for a third counterpart. On the basis of the extensive survey that had been conducted prior to selecting the first two counterparts, the grantee recommended to the sponsor that the third counterpart institution be the University of Ife, which entered into the program on June 25, 1975.

All three institutions prepared and presented appropriate proposals which were established as three separate projects: Soong Jun University, B-426; Fundação Educacional do Sul de Santa Catarina, B-427; and University of Ife, B-455. Each counterpart was funded with a $45,000 grant provided for by Project A-1600.

Due to the fact that the first year of the project in Nigeria (B-455) will not be completed until June 24, 1976, this report will not cover its activities in depth; they will be reported in full at the end of Year III. Some of the immediate results of this project during the second year for the three counterpart institutions are the following:

**Project B-426—Soong Jun University (SJU), Korea**

1. Conduct of an on-site survey to determine the initial effects (at the end of 21 months) of this program on 19 small-scale industries that had received technical assistance. A total of 576 jobs had been created (a 55% increase in employment) and some companies reported profit and productivity gains ranging from 20% to 200%.

2. Provision of on-site technical assistance to 11 different companies in the Seoul area and 17 in the Taegon area, for a total of 28 technical assistance cases during the year.

3. Establishment of five programs of quality control at the SJU Computer Center and provision of on-site training on quality control methods to interested persons.

4. Establishment of interinstitutional agreements between SJU and the following two Korean agencies:

   The Industrial Advancement Administration (IAA) of the Ministry of Commerce and Industry
The National Federation of Medium Industries Cooperatives

5. Awarding by SJU of a grant to the Director of the Integrated Development Center to study the socioeconomic impact of this program in Yong-In, Kyoungy Province.

6. Design and development of a simple production fixture for a small-scale industry and development of four other appropriate technology devices.

7. Provision of consulting services by the Economic Development Laboratory staff in Korea.

8. Preparation of an audiovisual documentation of the second-year program.

9. Establishment by the College of Engineering at SJU of the Department of Industrial Engineering.

10. Training at Georgia Tech's Economic Development Laboratory of three persons sponsored by SJU.

11. Presentation of training programs, lectures, and seminars in several cities of Korea.

12. Addition of three new professional persons to the ITI staff at SJU.

Project B-427--Fundação Educacional do Sul de Santa Catarina (FESSC), Tubarão, Brazil

1. Generation of 31 new industrial jobs and an increase in sales of 4.1 million cruzeiros in eight of the companies assisted in 1974.

2. Expansion of the Basic Data Center (CDB). The holdings of the CDB were doubled during the year.

3. Strengthening of both the Center for Management and Technical Assistance (CETEG) and the Center for Permanent Education (CEP).

4. Establishment of the Adaptive Technology Center (CATT).

5. Provision of technical assistance services to 37 local small-scale industries in 11 different municipalities of the state of Santa Catarina.

6. Preparation and publication of four feasibility studies and 14 new manufacturing opportunity studies.

7. Training of 46 staff members.

8. Establishment of an audiovisual section and acquisition of appropriate equipment.
9. Preparation of an audiovisual documentation of the second-year program.

10. Presentation of over 10 conferences, seminars, and workshops.

11. Participation in or contribution to a number of economic development meetings and conferences.

12. Preparation and publication of an in-depth study of Santa Catarina for the Ministry of the Interior. The five-volume, 477-page study is being used by the government in preparing its economic development plan for the next five years.

Project B-455--University of Ife (UI), Ile-Ife, Nigeria

As indicated before, this project is only six months old and the final report is not due until later in 1976. Some actions have taken place during this brief initial period:

1. Preparation of the Project Plan for 1975-76 (Year I).
2. Provision of on-site technical assistance by EDL staff.
3. Selection of sites for the first two field offices of the University of Ife (UI).
4. Scheduling of training programs in Atlanta for UI staff members.
5. Preparation of the first- and second-quarter reports.
6. Completion of baseline study for the "area of influence" being served by UI.
7. Scheduling of audiovisual documentation of the Year I activities.

The sections that follow in this Year II final report fully describe the background, objectives, and overall activities of the program. The report also highlights some of the results achieved by the project staff and the conclusions reached by the Project Director and staff.
Background

The Economic Development Laboratory (EDL), formerly the Industrial Development Division of the Engineering Experiment Station at the Georgia Institute of Technology, a nonprofit organization, has been in existence since 1956. This internationally known unit of Georgia Tech now has an interdisciplinary staff of 75 persons and a broad and diversified program of economic development activities. It was created to provide the research and technical services required to accelerate the economic growth of the state of Georgia.

The Laboratory's broad program of industrial and economic development research, service, information, and training covers 10 major fields of activity: area development, community development, market analysis, industrial economics, management and technical assistance to industry, technical information services and technology transfer, manpower resources, basic data collection and dissemination, industrial and economic development training, and international development services. Special studies relating to natural resources, plant location, industrial land use, and industrial development program planning also are conducted.

In the spring of 1964, the then Industrial Development Division (IDD) became interested in the possibility of establishing an international program as a natural extension of its development work in process and previously carried out in port cities and adjacent coastal areas, particularly in Savannah and Brunswick, Georgia. In further investigating this idea, it became apparent that at the time there were few, if any, universities in this country which were actively engaged in training Latin American students in the basic principles and methodologies of industrial development.

Having recognized the need for and potentials of a sound program of industrial development for the emerging nations, especially in Latin America, the Economic Development Laboratory added to its professional staff bilingual personnel with extensive industrial experience in both Latin America and the United States.

The International Development Branch of the Economic Development Laboratory then began to draw on the experience gained by IDD during its earlier years through the broad-gauged industrial development programs operated in Georgia.
In 1972, after a series of successful AID-sponsored projects in Latin America, the Economic Development Laboratory was awarded an AID 211(d) grant.

It was under this grant (Project B-414) that EDL identified the need for stimulating the growth of small-scale industries in less-developed countries (LDC). In an attempt to respond to this identified need, EDL prepared a proposal under the title of "Stimulating Growth of Small-Scale Industry," which was submitted to AID for consideration on October 15, 1973. Early the following year (January 23, 1974), the proposal was accepted and funded by AID, and the administrative portion of the contract became Project A-1600 at the Georgia Institute of Technology.

The EDL staff had identified the general problems associated with the expansion and diversification of existing industries and the creation of new small industries in the following manner:

1. Lack of a system analysis approach to providing research, services, and information to industry.

2. Insufficient funding to expand industrial assistance activities.

3. Continuing need for training of more organizational staff personnel.

4. Lack of knowledge of pragmatic methodologies.

5. A deficient information base related to technical and management problems of small-scale industries.

The Economic Development Laboratory suggested a program that would attempt to cope with these problems. Some of the basic elements suggested in the proposal were:

1. An organization focus with clearly defined aims.

2. A well-trained and motivated staff.

3. An information base.

4. A technical assistance "delivery system."

When this program was funded by AID, Project A-1600 was created to serve as the administrative project, and $45,000 grants were made to each of the counterpart institutions. Mr. Nelson C. Wall, Head of the International Development Branch, is serving as Project Director on A-1600.

The terms of the grants to counterpart institutions permitted the grantee to utilize half of the grant funds for personnel, travel, materials and
supplies, conferences, etc. The balance of the funds were to be used by the
grantee to obtain training and consultation from U.S. technical assistance
organizations.

The Georgia Institute of Technology and the Technology and Development
Institute, East-West Center, subsequently contracted with the grantees to pro-
vide training, consultation, and audiovisual documentation of the projects.

The counterpart institutions currently funded (Year II) for the project
may be briefly described as follows:

Soong Jun University. Soong Jun University was formed in 1970 when Soong
Sil College united with Taejon College to form a new cooperative venture in
the field of Christian education. Soong Sil College, in turn, was formed in
Pyeng Yong (North Korea) in 1897 and reopened in Seoul in 1954, after being
closed in 1938 during the Japanese occupation. Taejon Presbyterian College was
founded in 1956 by the Southern Presbyterian Mission in the city of Taejon.

The main campus is located in Seoul near the large industrial area of
Yeong Dung Po, which has a population of about 1.5 million inhabitants. The
second campus at Taejon is near a smaller industrial area with a population of
about 450,000 persons. In 1974, the government of Korea announced plans for
the development of a new "science town" adjacent to the Taejon campus.

Immediately after Dr. Hahn Been Lee became President of Soong Jun Univer-
sity in March 1973, contacts were made by Mr. Ross W. Hammond, Director of the
Economic Development Laboratory, with Dr. Lee. As a result of these contacts,
both institutions entered into an agreement of mutual cooperation on July 30,

Fundação Educacional do Sul de Santa Catarina. The Fundação Educacional
do Sul de Santa Catarina (FESSC) is an autonomous entity, as established by
the Civil Code and national legislation under Decree Laws 200 and 900. It was
constituted by Municipal Law Number 443-67 of October 18, 1967. It was recog-
nized as being of utility to the Federal Government by Decree Number 70.680
of June 7, 1972.

FESSC has the following objectives: (1) develop middle and higher educa-
tion as required by the labor market, which is to be done by formal and inform-
al course work; (2) promote education and research related to the development
of the state of Santa Catarina; and (3) engage leadership and population in
the process of self-promotion to develop the local and regional areas.
From 1974 to 1975, enrollment in higher education (at present 10 programs) at FESSC increased from 1,200 to 2,000 persons, representing 32 municipalities. In 1975, there were over 3,000 students in nine programs of the middle education level, as part of the integrated professional-educational system of the city. Through its multidisciplinary staff, with 10 full-time technical persons, the Department of Research and Development (DPD) of FESSC by 1975 had been able to carry out 40 research projects and studies at the request of the public sector and private initiative, specifically in the areas of small and medium industries.

Since early 1972, FESSC and Georgia Tech's Economic Development Laboratory (EDL)—formerly the Industrial Development Division—had been jointly studying the possibilities of initiating a joint program of work. As a result of these early deliberations, both institutions officially entered into an agreement on March 11, 1972. The agreement established that the signatories, as centers of higher education, have common interests in both local and regional development and in the development of students at a professional level for the area of South Santa Catarina. The agreement also provided for the cooperative promotion of programs, projects, and activities, with the understanding that other organizations may participate.

FESSC then presented a proposal to the Georgia Institute of Technology entitled "Program of Development for Small and Medium Industries." It was implemented by a grant funded under this contract, which was provided to the Georgia Institute of Technology by the Agency for International Development (AID) for this purpose.

In 1974, the Economic Development Laboratory, in cooperation with FESSC, initiated Year I of a program of small-scale industry development. This program was expanded in 1975 (Year II), again, under funding by the Agency for International Development.

University of Ife. The University of Ife was established by the Government of the Western State of Nigeria in October 1961. It is financed by the Federal Government and the Western State Government on a 40%-60% basis. It admitted its first students in October 1962. The Department of Economics in the Faculty of Social Sciences was one of the earliest departments to be set up in the university. The university's student enrollment has grown from 300 in 1962 to about 5,000 in the 1973-74 session. The Faculty of Social Sciences
has grown in number from 23 in 1962 to about 350 in 1973-74. The Department of Economics has the largest number of students in the Faculty of Social Sciences--215 out of a total of 250. The staff of the Department of Economics has increased from three in 1962 to 20 in the 1973-74 session.

The University of Ife is located in the heart of the agricultural area of the Western State. It is committed to a close identification with, and improvement of, the agricultural, commercial, industrial, and cultural activities of the population around it.

In its research commitments, therefore, the university places a great emphasis on relevant applied research, without sacrificing the necessary theoretical and fundamental research. It is in this spirit that the University of Ife has set up research programs on (1) population and manpower, (2) drugs, (3) customary laws, (4) coal and allied minerals, (5) human resources, (6) Kainji Dam problems, (7) agricultural extension and implementation, and (8) small and medium-scale industries. All these are action-oriented programs and are designed to bring community problems into day-to-day analysis and investigation by University of Ife scholars, on a teamwork basis.

The Industrial Research Unit was set up by the Department of Economics in August 1969, following 18 months of discussion among some staff members of the department. With a grant of N6,000 in 1969-70 from the University of Ife, the unit began to collect data on the small and medium-scale industries in the Western State through the efforts of the staff and the students of the Department of Economics during their vacations and on weekends. Since 1969, the unit has collected data on about 30,000 industrial units which range from the one-man blacksmith or tailor to the more sophisticated electronic industry employing up to 50 persons.

The survey has been undertaken in five of the 12 states in Nigeria--Western State, Mid-Western State, Lagos State (in the south), and Kwara and North-Eastern states (in the north). The unit has, as a result of its modest achievements, attracted grants from the Federal Government, four state governments, the Ford Foundation, and from some commercial banks and individual Nigerians. The unit has published a number of reports and journal articles, and has held seminars and training courses for small industrialists, and government officials who are charged with industrial development.
The unit has three principal objectives:

1. The continuance of information-gathering with a view to performing academic study, analysis, and interpretation of the data collected. The unit proposes to build up a data bank and materials for teaching and research.

2. Establishment of an effective industrial extension service to assist the existing industries to develop, grow, and modernize their operations and to create a linkage between them and the large industries, on a functional basis.

3. The encouragement of community industries through close liaison between the unit and the communities that have raised, or will raise, money to set up community enterprises.

In 1975, the Economic Development Laboratory, together with the University of Ife, initiated Year I of a Program of Small-Scale Industry Development.

Objectives

The continuing objectives of this program are best defined in the following manner:

1. To encourage selected developing country organizations to focus on employment generation through programs which accelerate the expansion of existing industry and the creation of new small industries.

2. To demonstrate and document the impact of alternative approaches to the stimulation of small industry.

3. To create in the appropriate governmental, industrial, and financial sectors of small industry an awareness of potentials and ways to maximize these potentials.

The three counterpart projects (B-426, B-427, and B-455) have their own specific objectives which coincide with the overall philosophy of the main objectives of this program. The project administration, under the contracts with the grantees, also established two main areas of involvement for the Economic Development Laboratory staff: (1) training of selected counterpart staff both on-site and in the U.S.A. and (2) provision of on-site consultative services to the different programs. It was further established that the EDL project staff would assist the counterpart personnel in providing managerial, engineering, scientific, and technical assistance to selected small and medium-size industries in the selected host countries. All of the established objectives for Year II were met during this reporting year.
Total Project Goals of the AID/ta-c-1062 Contract

At the start of the Small-Scale Industry Grant on January 23, 1974, the following total goals had been established by the Agency for International Development for the Georgia Tech grant, to be achieved over a period of four years: "The general objective of this contract is to generate employment in developing countries, particularly outside the metropolitan centers, by: (a) strengthening the capability of a selected institution in each country to provide effective technical assistance to local small industry, (b) demonstrating and documenting the impact of alternative approaches to technical assistance to small industry, and (c) infusing the governmental, industrial, and financial sectors of the local community selected to provide employment with the understanding of the techniques of generating jobs. The above objective will be carried out through the use of grants to selected Lesser Developed Country (LDC) organizations."

Once the total project goals are reached, the sponsor anticipates the following outputs:

1. Increased job opportunities in four countries.
2. Increased viability of indigenously owned enterprises.
3. Improved capability of four LDC institutions to serve small industry.
4. Tested methodologies for strengthening LDC institutions.
5. Evaluation reports on successes and failures in assisting small industry.

All of the established goals for Year II were met plus several additional accomplishments which were listed in the introduction and will be presented in further detail in the balance of this final report.

Program of Work

The role of the Economic Development Laboratory is to administer the project, providing guidance to the participating institutions in designing and developing their programs, providing advice and counsel as required, suggesting alternative options for their consideration, monitoring the implementation, and in general providing the necessary leadership to assure the desired positive results mentioned in the project goals.

The EDL Project Director then generated for Year II a suggested program for each counterpart institution. These suggested programs were modified by
the Counterpart Project Directors to meet their own needs and objectives. In an attempt to establish criteria which would allow some degree of comparison among all projects, the suggested program had the following major recommended activities:

1. **Counterpart Organization Functional Activities**
   a. **Organization.** The counterpart will administratively designate a unit to mount a program of research, service, training, and technical information for the small industry sector. Staff personnel will design the program based on the organization's goals and motivations.
   b. **Facilities and Staff.** The counterpart will provide adequate office, equipment, and other resources to the designated units to permit its staff to function effectively. Staff personnel who have appropriate backgrounds and who, with appropriate training, can implement the program of assistance will be assigned to the unit.
   c. **Technology Transfer.** An information collection will be established by the counterpart where it does not exist to permit the staff to conduct research on industrial problems, needs, processes, and products, especially as they related to small-scale industry, and to disseminate technical information.
   d. **Delivery System.** The counterpart will design and implement a procedure to permit direct contact with small industries and entrepreneurs for the purpose of ascertaining their needs and problems and for the provision of staff assistance and research in the solution of problems, both management and technical in nature. This industrial extension activity will have as its aim the expansion and diversification of existing and new industry.
   e. **Education and Training.** The counterpart will design and deliver appropriate training programs related to small-scale industry. Educational programs related to industrialization will be encouraged.

2. **Independent Continuing Activities.** The counterpart will design, in cooperation with the EDL project director, a specific program of continuing
activities which should include, but not be limited to, the following major subject areas:

a. **Research Activities.** For example, this could be in the areas of:
   (1) preparation of case histories; (2) approaches leading to employment generation; (3) analysis, evaluation, and development of new industrialization technique if appropriate, products, and processes. Other research activities also will be considered.

b. **Industrial Extension Activities.** This should be a pragmatic type of program related directly to serving the new and existing small-scale industries. Sample activities would be: (1) industrial problem-solving; (2) advice to and consultation with industry; (3) survey of small-scale industry problems and needs.

c. **Training Activities.** The counterpart institution should consider the possibility of providing on-site training to persons in industry. This training may be to management, supervisors, or employees, as needed. Some sample subjects to be considered are: (1) market analysis, (2) small industry operation, and (3) industrial processes.

d. **Educational Activities.** This is an option, but if the counterpart is an educational institution, it is highly recommended.

e. **Training and Consultation.** This task will be the responsibility of the EDL staff. As needed, selected counterpart institution staff will receive appropriate training at the EDL headquarters in Atlanta, Georgia. The training may take various forms as appropriate, including classroom work, on-the-job training, consulting and advisory services, plant tours, and other pertinent topics.

Using the established program guideline, the individual counterpart institutions then developed their corresponding programs for this year. The individual programs are summarized as follows:

**B-426--Soong Jun University (SJU).** For their second year of activity, the following program was designed:

1. **Organization.** Several organizations within SJU were concerned with the implementation of this program. These organizations were the Integrated Development Center (IDC), the Industrial Technical Institute (ITI), and the Regional Development Institute (RDI). All programs were to be oriented to serving the small and medium-size industries in the selected municipalities.
2. **Staff and Physical Plant.** Once the basic needs of the different units had been identified, appropriate office space, equipment, and manpower were allocated to assure basic logistical support to this project. Three new faculty members joined the Industrial Technical Institute staff, one each from the Electrical, Chemical, and Industrial Engineering Departments.

3. **Program Areas.** The SJU Project Director and his counterpart at EDL jointly designed a viable program to assure the implementation of the following activities during the second program year:

   a. **Small-Scale Industry Information Center (SSIIC).** This center was established during Year I of the program and had the responsibility of collecting and generating the basic data relevant to the project. The initial collection of information would focus on management and technical data appropriate to small-scale industries.

   For Year II, it was planned that increased emphasis would be given to the following areas of work:

   1. Collection, classification, and dissemination of pragmatic, up-to-date information on Korean and international material important to the small-scale industries.
   2. Promotion of wider cooperation and coordination between small-scale industries, the community, and SJU.
   3. Additional on-site consultation and assistance from the EDL senior staff as needed.
   4. Implementation of the guidelines established during Year I for the operation of the SSIIC.

b. **Industrial Training and Education.** The successful short-term training program for the SJU staff that was carried out during Year I was to be followed by others during the second year. The programs would be offered to small industry managers, engineers, and to entrepreneurs in general.

   1. Presentation of educational programs (short-term) during the year, with consultants assisting in on-site programs. The following areas were considered:
      o Management seminar (e.g., bill collection, taxation, sales, promotion, work improvement, quality control)
      o Training for students who are to be involved in local industry technical assistance services
      o Entrepreneur promotion (e.g., motivation, proposal preparation, accounting, sales)
Continuation of the audiovisual case history started in Year I.

Additional staff training in accordance with needs.

c. University Training and Education. At the end of Year I, Soong Jun University was starting to get some of the feedback resulting from the activities of the year. An Industrial Engineering Program was designed and was approved by the Ministry of Education in 1974. SJU made plans to offer the new program in Industrial Engineering by the fall of 1975.

The following additional activities were scheduled for the second year:

(1) Continued preparation of classroom material and course work for the Industrial Engineering Department, to be used by the fall of 1975.

(2) Continued review and reform of the university curriculum.

(3) Identification of specific effects on university educational policies and practices as a result of these industry-oriented programs.

d. Industrial Extension and Research Activities. At the end of the first year, policies and methods had been established which permitted SJU to link up with existing small industries in the target areas and numerous technical assistance activities had been carried out. The plans for Year II considered the following activities:

(1) Pragmatic technical assistance by SJU staff members in the following four major areas:

- Mechanical Engineering: Four or five companies at Yeong Dung Po Industrial Complex and three to five small companies in Kyung Ki Province were to be selected for concentrated service. Emphasis was to be given to quality control, simple tool design, and general training.

- Electrical Engineering: Three to five small companies in Kyung Ki Province of the Seoul area would be selected for diagnosis and service. Emphasis was to be given to electrical economy, safety, and general training.

- Chemical: Three small companies would be selected for concentrated effort in the Taejon area.

- Textile: Two small companies in the Taejon area would be selected.
Managerial technical assistance also would be provided during this year, with emphasis on the following activities:

- Studies on improving market strategy and financial strategy.
- Recommendations for better inventory control for effective productivity.
- Studies on better accounting methods available for small industries.
- Time and motion studies and methods work.
- Feasibility studies for establishing new small industries.
- Cost accounting and other control studies for small industry.

**B-427--Fundação Educacional do Sul de Santa Catarina (FESSC)**

1. **Organization.** The original organization at FESSC has been modified, and specific responsibilities were established for the new units so that they would start implementing the different assignments identified by the program. The newest unit, the Adaptive Technology Center (CATT), was to receive special attention, with most of the staff training to be focused on the professional staff of the CATT. All programs were to be oriented in such a manner as to serve the small and medium industries in the selected municipalities.

2. **Staff and Physical Plant.** Based on the identified needs of the different units in the program, appropriate office space and equipment were allocated to assure the necessary logistical support to the project. The acquisition of audiovisual equipment also was considered of the highest priority. Staff needs were still uppermost, and candidates were selected to be considered during the year. The candidates were selected on the basis of interest in the program, capability and motivation to carry out the requested task.

3. **Program Areas.** The EDL Project Director and his counterpart at FESSC jointly designed a program to support the implementation of the following activities during Year II:

   a. **Basic Data Center (CDB).** This unit had suffered heavy losses during the March 1974 flood and many of the publications had been damaged or destroyed.  

   

   1/ For details, refer to Jose Muller's and Nelson C. Wall's report, Final Report--Fundação Educacional do Sul de Santa Catarina (FESSC), Small-Scale Industry Grant (January 10, 1974, to January 9, 1975), Industrial Development Division, Georgia Institute of Technology, Atlanta, Georgia, January 1975.
During Year II, emphasis was to be given to the following areas of work within the CDB:

1. Complete cleanup of the damages caused by the flood.
2. Collection, classification, and dissemination of pragmatic, up-to-date information on Brazilian and international material relevant to small-scale industries.
3. Additional on-site consultation and assistance from the EDL senior staff as needed.
4. Implementation of the guidelines established during Year I for the operation of the CDB.

b. Center for Management and Technical Assistance (CETEG). As part of the first-year program, this center was established during the summer of 1974. During Year I, CETEG was able to establish the operational policy for the center and eight small-scale industries were serviced. The March 1974 flood created an emergency which necessitated assignment of all staff members to assist in the reconstruction of the many small-scale industries that had been damaged.

For Year II, the following activities were planned:

1. Continue to provide technical assistance to eight small-scale industries originally selected and add up to 10 more during the year.
2. Prepare and complete two feasibility studies during the period.
3. Train students who are to be involved with CETEG staff in carrying out technical assistance services.
4. Prepare management guidelines for small-scale industries.
5. Continue the audiovisual case history started in Year I.

c. Center for Permanent Education (CEP). This was the third new center created during Year I. Its purpose is to provide adult continuing education services in Santa Catarina, for which there is a great need. In spite of the damages caused by the flood, this center continued its operation and has been able to establish close links with all the "human resources development" groups of the area, such as:

- Fundação Legião Brasileira de Assistência (FLBA)
- Serviço Nacional de Aprendizagem Industrial (SENAI)
- Programa Intensivo de Preparação de Mão de Obra (PIPMO)
- Fundação Gaúcha do Trabalho (EGT)
For Year II, the CEP planned to present about 30 programs to an anticipated audience of 1,000 participants. The programs were to be designed to respond to the educational needs of the indigenous manpower.

d. **Adaptive Technology Center (CATT).** Although this fourth center was established during Year I, it had been very slow in starting, and just before the end of the first year, the FESSC staff engineer responsible for the center had left FESSC. During Year II, the new manager of the center, Mr. Adalgiso Domingues, would be trained at EDL Atlanta and the center would be reactivated. This unit would have the responsibility of providing technical assistance and adapting "foreign" technologies to the local needs of small-scale industries.

e. **Industrial Training and Education.** A specific short-term training program had been initiated during the last week of Year I. This program was to be continued into Year II and the three selected member of the FESSC professional staff would complete their training at EDL headquarters in Atlanta during Year II.

FESSC staff, in the meantime, would offer industrial training programs to workers in small-scale industries and the general public as needed. These programs would be presented in the target areas and also at FESSC headquarters in Tubarão.

**B-455--University of Ife (UI).** As indicated earlier in this report, the University of Ife (UI) entered into the program late in June 1975 and the program of work shown here will not be completed until mid-1976. At the present time, the first two quarters of Year I have been implemented.

1. **Organization.** The Industrial Research and Development Unit (IRDU) of UI is the counterpart unit responsible for this project. Organizational changes may be considered at a later date, after the program has been in operation for a period of one year. Specific responsibilities for this program were established within the unit.

2. **Staff and Physical Plant.** Based on the identified needs, appropriate office space and equipment were allocated to the project. Later in the year, two additional extension offices were to be established. Staffing needs are the most pressing, and candidates will be selected during the year to fill the necessary positions.
3. Program Areas. A program was jointly established to support the implementation of the following activities:

a. Small-Scale Industry Information Center. Training on appropriate information center personnel of IRDU will be conducted in Atlanta and on-site as needed. Guidance will be provided in developing the collection, establishing procedures, etc. Basic information available at EDL will be made available to IRDU. This information center will be especially needed as an information backup for the field office personnel.

b. Industrial Extension and Research Activities. Training will be provided in appropriate aspects of industrial extension and research activities to IRDU personnel, both in Atlanta and on-site. On-site consultation will be provided to assist in the expansion and diversification of existing small-scale industries and to help in the creation of new small-scale enterprises.

c. Industrial Training and Education. Specific short training programs will be devised for IRDU faculty to better equip them to deal with the real-world problems of small-scale industry. In particular, training in the preparation of project feasibility studies and market analyses will be provided under the proposal. The training will take various forms as appropriate, including classroom work, on-the-job training, consulting and advising, plant tours, contacts with technical information sources, etc.

d. Technical Assistance. In particular, industrial engineering expertise will be made available to the IRDU staff, as required.

e. Audiovisual Documentation. An audiovisual record of project activities will be made and slides, photographs, and videotapes will be provided to the University of Ife for use in training, seminar presentations, and contract and grant solicitation.

Two of the above counterpart programs are described in full in the following reports:

Yoon Bae Ouh and Nelson C. Wall, Final Report, Year II--Soong Jun University, Small-Scale Industry Grant, Georgia Institute of Technology, Project B-426 Report, Atlanta, Georgia, 1976.

Jose Muller and Nelson C. Wall, Final Report, Year II--Fundação Educacional do Sul de Santa Catarina, Small-Scale Industry Grant, Georgia Institute of Technology, Project B-427 Report, Atlanta, Georgia, 1976.
Use of Grant Funds

Each of the three grantees was funded for a grant year in the amount of $45,000. Disbursement of these funds are shown as Tables 1, 2, and 3, respectively for the three grants.
Table 1  
DISBURSEMENT OF GRANT FUNDS
SOONG JUN UNIVERSITY
Year II

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Ind.-Univ. AID</th>
<th>Foundation¹/</th>
<th>SJU²/</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct salaries, wages</td>
<td>$13,500</td>
<td>$5,000</td>
<td>-</td>
<td>$18,500</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>$4,000</td>
<td>-</td>
<td>-</td>
<td>4,000</td>
</tr>
<tr>
<td>Local</td>
<td>$2,750</td>
<td>750</td>
<td>-</td>
<td>2,750</td>
</tr>
<tr>
<td>Materials/supplies</td>
<td>2,000</td>
<td>-</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Conferences/seminars</td>
<td>1,000</td>
<td>-</td>
<td>-</td>
<td>1,000</td>
</tr>
<tr>
<td>Contracted services (GIT/IDC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SJU personnel training</td>
<td>10,500</td>
<td>-</td>
<td>-</td>
<td>10,500</td>
</tr>
<tr>
<td>EDL consulting</td>
<td>10,000</td>
<td>-</td>
<td>-</td>
<td>10,000</td>
</tr>
<tr>
<td>TDI (E-W Center)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Av. case work</td>
<td>2,000</td>
<td>-</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>SJU indirect expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General overhead</td>
<td>-</td>
<td>-</td>
<td>$ 8,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Technical service support</td>
<td>-</td>
<td>-</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>$45,000</td>
<td>$5,750</td>
<td>$11,000</td>
<td>$61,750</td>
</tr>
</tbody>
</table>

¹/ The Industry-University Cooperation Foundation is a newly established (1974) organization in Korea designed to promote mutual cooperation from which SJU applied for and received a grant.

²/ Normal overhead allowance plus depreciation allowance for use of university labs and workshops.
### Table 2
**DISBURSEMENT OF GRANT FUNDS**  
**FUNDAÇÃO EDUCACIONAL DO SUL DE SANTA CATARINA**  
**Year II**

<table>
<thead>
<tr>
<th>Programmed Activities</th>
<th>Assigned Funds</th>
<th>Cost Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GIT¹/</td>
<td>FESSC</td>
</tr>
<tr>
<td>1. CETEG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Senior Mgr.</td>
<td>$ 9,000</td>
<td></td>
</tr>
<tr>
<td>1 Prof. Tech.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Adm. Asst.</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local trips</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Preparation of Profiles, Cons. Asst., Train. Tech. Asst. Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Basic Data Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Jr. Mgr.</td>
<td>5,800</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training and trips</td>
<td>10,500</td>
<td></td>
</tr>
<tr>
<td>Materials and Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Equipment</td>
<td>3,150</td>
<td></td>
</tr>
<tr>
<td>and mat.</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Consultants on audio-visuals (TDI-E-W-Ctr.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inst. of Cons. and Maint. Mat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhead 15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>$22,500</td>
<td>$22,500</td>
</tr>
</tbody>
</table>

¹/ From AID under Small Industry Grant.  
²/ As contribution to success of the program.  
³/ TDI at the East-West Center will contribute the time of their audio-visual specialist and the needed equipment.
Table 3
BUDGETED DISBURSEMENT OF GRANT FUNDS
UNIVERSITY OF IFE
Year I

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>AID</th>
<th>Univ. of Ife</th>
<th>Poss. Outside Grant Fed. Gov. State</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary of research and teaching staff of IRDU Ife (equivalent to seven full-time staff at an average of $3,500 each)</td>
<td>$24,500</td>
<td>-</td>
<td>-</td>
<td>$ 24,500</td>
</tr>
<tr>
<td>Office equipment, maintenance at Ife</td>
<td>-</td>
<td>10,000</td>
<td>-</td>
<td>10,000</td>
</tr>
<tr>
<td>Salary of extension workers at average of $3,000 plus secretary</td>
<td>$10,000</td>
<td>6,000</td>
<td>$ 2,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Field equipment and travel of extension workers</td>
<td>5,000</td>
<td>4,000</td>
<td>1,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Vehicles for field staff and other equipment</td>
<td>3,000</td>
<td>3,000</td>
<td>1,000</td>
<td>7,000</td>
</tr>
<tr>
<td>Rent of field station</td>
<td>2,000</td>
<td>-</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Seminars and training courses</td>
<td>2,500</td>
<td>3,000</td>
<td>1,000</td>
<td>6,500</td>
</tr>
<tr>
<td>Training and visiting in U.S.A. for Ife staff</td>
<td>-</td>
<td>5,000</td>
<td>5,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Traveling for EDL staff, U.S.A.-Nigeria-U.S.A. and maintenance costs in Nigeria</td>
<td>8,000</td>
<td>-</td>
<td>-</td>
<td>8,000</td>
</tr>
<tr>
<td>Training and consulting by Georgia technology</td>
<td>10,500</td>
<td>-</td>
<td>-</td>
<td>10,500</td>
</tr>
<tr>
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GENERAL ACTIVITIES DURING PROGRAM YEAR II

Earlier in this report, it was indicated that Project A-1600 was established by the Georgia Institute of Technology as the administration project and all implementation would be performed under the companion projects B-426, B-427, and B-455. In view of this, it was considered necessary by the Project Director to structure the report in such a manner as to allow this section to highlight some of the specific activities of the participating institutions.

Soong Jun University (SJU)

As reported in the end-of-the-year report for Project B-426, the staff at SJU accomplished many tasks, among which the following are presented in summary form:

1. Small-Scale Industry Information Center (SSIIC). This unit dedicated to the collection and classification of economic development data has not met the original expectations. At present, the SSIIC is scheduled to be reassigned to the Engineering Library, with hopes that it will become functional and viable to the overall project. During the year, EDL staff specialists were assigned to this unit in an attempt to enhance the total operations of the center, but, unfortunately, it appears that the recommendations made by the EDL staff specialists were not implemented.

2. Industrial Training and Education. A five-week training program was presented at the EDL headquarters in Atlanta, Georgia, for three persons sponsored by SJU. Of the three participants, two were members of the SJU professional staff and one was a local industrialist. The three participants were:

   Prof. Won-Hoe Koo
   Head, Chemistry Department, SJU, Taejon

   Prof. Young-Ho Lim
   Assistant Head, Mechanical Engineering, SJU, Seoul

   Mr. Young-Ho Chae
   President of the Sam-Ho Machine Industries Company

A related activity was establishment of five programs of quality control for the IBM 1130 at the Computer Center in Seoul. These programs were established by Dr. Kenneth Stephens of the EDL staff while on-site at SJU. The counterpart staff, assisted by Dr. Stephens, also presented a series of seminars, sponsored by the Korean Chamber of Commerce, on quality control.
3. Audiovisual Documentation. The counterpart institution contracted with the East-West Center, Hawaii, for an audiovisual documentary of Year II activities. Mr. Fred Burian of the East-West Center, assisted by Mrs. Edwina Udunka of EDL, went to Korea for one week and accomplished this task. The SJU staff handled all the arrangements for the taping sequence and other logistical matters.

4. University Training and Education. As a result of actions initiated during Year I, the appropriate officials in Korea authorized SJU to establish a Department of Industrial Engineering within the College of Engineering. During the year, the academic staff has been expanded by the addition of one more professional person, Mr. Pyung-Kyu Choi, an industrial engineer.

As a secondary objective, the Year II program attempted to identify specifically the socioeconomic impact that these industry-oriented programs had on the population. As a result of this interest, Dr. Y. B. Ouh, Director of the Integrated Development Center, was funded by SJU to conduct a survey and determine this impact in the Kyoungy Province.

5. Industrial Extension and Research Activities. Without doubt, this was the main activity for Year II. In an all-out effort, the SJU staff was able to provide technical assistance to 28 industries, of which 11 were in Seoul and 17 in Taejon. According to the SJU records, over 139 visits were made to these 28 industries during the year, or an average of about five visits per company, in an attempt to provide the necessary assistance. This is far better than the previous year, when only 18 companies were serviced.

In an attempt to quantify the results of the technical assistance service to small-scale industries, 19 companies that had been serviced were surveyed. They reported increasing employment by 576 jobs (55%) and registering productivity or profit gains ranging from 20% to 200%.

6. Appropriate Technology. The Year II program specifically stressed the area of appropriate technology. In the past two years, SJU staff members have developed four devices which are considered by them to be appropriate to the Korean culture:

- A low-cost tensile strength tester
- A sizing or shaving die for truing up metal rod cross sections
- A low-cost immersion pyrometer
- A wheeled version of the "chegae" or Korean backpack
Figure 1, on the following page, presented the total Project Plan for Year II.

Fundação Educacional do Sul de Santa Catarina (FESSC)

The corresponding end-of-the-year report for this project (B-427) clearly establishes the many accomplishments of the highly motivated and dedicated staff of the institution. The following summary briefly highlights some of the activities sponsored by the program:

1. Basic Data Center (CDB). Although the CDB was practically destroyed in 1974 as a result of the disastrous flooding of the Tubarão River, the CDB has been reconstructed. During the year, an EDL staff specialist was assigned to assist the CDB, and following his visit, all the recommendations were rapidly implemented. As a result, the CDB has doubled its holdings.

   In addition, the joint project staff conducted a survey of information sources in five major cities of Brazil—Tubarão, Porto Alegre, Florianopolis, São Paulo, and Rio de Janeiro. During the year, over 600 documents were received, classified, cataloged, coded, and entered into the FESSC collection. As part of this programmed growth plan, the CDB will be purchasing microfiche readers (external funds) next year.

2. Center for Management and Technical Assistance (CETEG). This has been a successful operation since the start of Year I. The professional staff of CETEG has moved quickly into the area of provision of technical assistance to local industries. This year, 37 small-scale industries were serviced by the program in 11 municipalities within the state of Santa Catarina, which has 9,500 square kilometers.

   Following the continuous evaluation system established by the Project Director at the start of this program, a survey was conducted of eight industries that were recipients of technical assistance services during Year I. These eight small-scale indigenous industries reported that 31 new jobs had been generated and sales had been increased by 4.1 million cruzeiros (112% gain).

   During the program year, the CETEG staff also researched and published four feasibility studies—Industria de Maquina Agricola, Industria de Móveis, Industria de Confecções and Incomal—Industria e Comercio de Madeiras, Ltd. The last study, Incomal, has been implemented by a local investor; the plant was located in Mirim, municipality of Imbituba, creating 47 new jobs.
Project No. B-426
Project Title SIG-SJU-Year II
Project Director N. C. Wall

- Project Initiation January 10, 1975
- Project Preparation (SJU & EDL)
- Quarterly Reports (SJU & EDL)
- Consultant Service - Technical Asst.
- Consultant - Quality Control
- SJU Staff Training - Atlanta
- Operation of Data Center
- Technical Assistance Service
- Audiovisual Documentation
- Project Direction and Reporting
- On-Site Seminars - Workshops
- SJU Technical Assistance Service
- Final Report

FIGURE 1
PROJECT PLAN


LEGEND
Staff 1 N. C. Wall 3 K. Stephens 5 L. Eden 7 Y. Ouh
2 B. James 4 R. Johnston 6 Burian-Udunka 8 SJU Staff
The CETEG staff also was able to research, prepare, and publish 14 new manufacturing opportunity studies during the year. The studies, some of which are being considered by entrepreneurs, are on a wide variety of small-scale industries appropriate to southern Brazil.

Four other major documents were published by CETEG, as a result of specific studies conducted by the staff during the year. These published reports were as follows: (a) a study of human resources in the AMSESC area (125 pages); (b) an in-depth look at the economy, social problems, industry, and resources of Santa Catarina (five volumes, 477 pages); (c) a study of the appropriate methodology for the provision of technical assistance to small-scale industries in that area of Brazil (60 pages); and (d) a research project to establish the feasibility of creating a "technology center" in Santa Catarina.

3. Center for Permanent Education (CEP). Expanding the very successful training programs offered by CEP during Year I, the accomplishments this year were far more exciting. A series of in-house training programs were conducted for FESSC staff members, and 46 persons were able to successfully complete the program requirements. The EDL on-site staff participated heavily in these training sessions.

4. Industrial Training and Education. As a separate project under the CEP, special industrial training courses were offered to the local manpower interested in learning or improving a given skill. A total of 31 training programs were offered this year and 512 persons successfully completed the program requirements.

5. Audiovisual Documentation. An objective of the Year II program was the establishment of an audiovisual section within FESSC. This was accomplished, and now FESSC has its own camera and taping equipment for the taping of audiovisual reports. The counterpart contracted with the East-West Center, Hawaii, to tape the Year II audiovisual documentary, and this was also accomplished.

Figure 2, on the following page, is the Project Plan for Year II at FESSC.

University of Ife (UI)

Since Project B-455 is only halfway into the first year of implementation at this time, it is not possible to refer to any definite accomplishments
Project No. B-427
Project Title SIG-PESCC-Year II
Project Director N. C. Wall

Project Initiation January 10, 1975
Project Preparation (FESSC & EDL)
Quarterly Report (FESSC & EDL)
Consultant Service Data Center (CDB)
Operation of Data Center (CDB)
Consultant Management and T.A. (CETEG)
Operation of Management and T.A. (CETEG)
Selection of Manufacturing Opp. Studies
Preparation of Mfg. Opp. Studies
Audiovisual Documentation
Technical Assistance Service
Staff Training in Atlanta
Project Direction and Reporting
On-Site Seminars - Workshops
FESSC Technical Asst. Service
Final Report

LEGEND
Staff  1 N. C. Wall  4 H. Dalsasso  7 G. Morelos
2 R. Johnston  5 Staff  8 J. Muller
3 M. Hemkemeier  6 Udunka-Burian
at this early date. However, the following activities have been completed or initiated:

1. The Project Plan for 1975-76 has been prepared.
2. On-site technical assistance by EDL staff has been initiated.
3. Two sites have been selected for the first two extension service offices.
4. Staff training of UI personnel at EDL headquarter has been scheduled.
5. Baseline study has been completed.
6. Audiovisual documentation has been scheduled.

On the following page, the Project Plan for this year is presented as Figure 3 of the report.

Economic Development Laboratory

Each of the three counterpart institutions invested one half of their grant funds to obtain training and consulting assistance from the Economic Development Laboratory of the Georgia Institute of Technology. As part of this contractual activity, they also hired the Technology and Development Institute, East-West Center, Hawaii, to tape the audiovisual documentation of each project.

Under the contract with the Economic Development Laboratory, many staff members were on-site in performing their assigned tasks on these three projects. A brief listing of the individual EDL staff members follows. Some were funded by the corresponding project (B-426, B-427, or B-455); yet others, marked with an asterisk, were funded under an AID 211(d) grant to the Georgia Institute of Technology.

Soong Jun University, Korea

1975
January 26-February 2  Dr. Joseph Pettit*
January 26-February 2  Ross W. Hammond*
April 3-April 12  Kay E. Auciello*
June 29-August 2  Dr. Kenneth Stephens
July 22-August 7  Richard Johnston
September 1-September 20  Larry Edens
September 7-October 3  Harvey Diamond*
September 20-September 27  Fred Burian
**PROJECT PLAN**

**FIGURE 3**

**Project No.** B-455  
**Project Title** SIG-UI-Year I  
**Project Director** N. C. Wall

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**Quarterly Report**  
**Annual Report**

**LEGEND**
As in the past year, two audiovisual documents were taped—one each for SJU and FESSC. Copies of the videotapes, as well as a collection of still photographs, are available to the sponsor and/or other interested organizations. This audiovisual material is an integral part of this final report.
RESULTS AND CONCLUSIONS

The introductory portion of this report identified a few of the many accomplishments that have resulted from this Year II program of work under Projects A-1600, B-426, B-427, and B-455. This section will attempt to briefly summarize the conclusions and outline the results of each individual project.

Results of Soong Jun University Program (B-426)
1. A survey conducted during the past year of 19 small-scale industries that had received technical assistance since 1974 reported the following findings: (a) a total of 576 new jobs had been generated in these industries and (b) productivity or profit showed a gain varying from 20% to 200%.

2. Soong Jun University provided a grant to Dr. Y. B. Ouh, Director of the Integrated Development Center, to study the socioeconomic effects of this industry-oriented program in the province of Kyoungy.

3. The College of Engineering at SJU has established a Department of Industrial Engineering following the authorization given by the Ministry of Education. This is the ultimate result of actions initiated under this program in 1974.

4. Three persons were sponsored by SJU to come to Atlanta, Georgia, and receive special training at the EDL headquarters at Georgia Tech. Two of the participants were on the SJU professional staff and the third person was a local Korean industrialist.

5. The technical staff of the project designed and assisted in constructing a simple production fixture for one of the small-scale industries participating in this program. Four other devices were designed during the year as part of the "appropriate technology" phase of the program.

6. The audiovisual documentation which was started during the first year was continued and additional cases were recorded during Year II.

7. On-site technical assistance was provided by the EDL staff to both the counterpart institution and to many of the participating small-scale industries. A total of 18 man-weeks were spent by the EDL staff assigned to the project on-site in Korea. During the year, technical assistance also was provided to 28 different companies by the joint staff.
8. A staff specialist from EDL, during his tour of duty, established five computer programs on quality control at the SJU Computer Center. He also conducted a series of lectures on the same subject for interested industrialists and SJU staff personnel.

9. The SJU interinstitutional activities were expanded to include two additional organizations. This action will broaden the linkages of the university with the "real" world.

10. Several training programs, lectures, and seminars were presented during this year by the SJU staff to interested participants.

11. Three professional persons were hired during the year to further augment the ITI and SJU staff. All three persons are engineers and will be participating in this program.

12. Many other persons from the Georgia Tech staff visited SJU under the sponsorship of other AID grants to Georgia Tech. This greatly fortified the existing relationship and interfacing activities between both institutions of higher learning.

Results of the Fundação Educacional do Sul de Santa Catarina Program (B-427)

1. In a desire to evaluate the results of the technical service portion of the program, the FESSC staff conducted a survey of eight small-scale industries that had been recipients of this service during 1974. The survey results showed that 31 new industrial employees had been hired by these companies and that their sales volume had gone up 4.1 million cruzeiros (about $512,000) during the past year. One must remember that many of these companies suffered very heavy losses during the 1974 flood and, in some cases, were closed for several months because of the flood damages.

2. The joint project staff provided on-site technical assistance to 37 small-scale industries distributed over 11 different municipalities of Santa Catarina during the second program year. Many of them received a "continuous" type of technical assistance in which the assistance team constantly monitors the company activities and inputs to management.

3. A new industry employing 47 persons has been established as a direct result of a complete feasibility study conducted by the FESSC staff. Three other such studies were completed this year by the research staff of FESSC, and they are presently being considered by interested investors and entre-
4. The FESSC staff also researched, prepared, and published 14 manufacturing opportunity studies during the year. These studies are all for small-scale industries using local resources and with good potential domestic markets for the finished products. Many of these new manufacturing opportunities presently are being considered by local investors and entrepreneurs who are now aware of the highly professional work that FESSC is generating.

5. The Basic Data Center (CDB), which suffered a loss of over 80% of its information collection during the 1974 flood, has been totally rebuilt. The CDB is becoming the "information center" for that area of Brazil. At present, many government agencies and industrial enterprises direct their questions to the CDB, knowing that they will be provided with reliable, current, and viable replies. During the year, the CDB holdings were doubled on the basis of the existing collection prior to the flood. An EDL staff specialist worked on-site during the year to assist the CDB in enhancing its collection and broadening its information sources. All data required by the staff working on feasibility studies and the new manufacturing opportunity studies were provided by the CDB.

6. As part of the continuing upgrading of the FESSC professional staff, three additional members of the staff completed intensive training at the EDL headquarters in Atlanta, Georgia. Upon returning to FESSC, this group began conducting lectures and short courses for the other members of the FESSC staff.

7. In-house training programs were continued through the 1975 at FESSC. Coordinating with the EDL staff on-site, FESSC personnel presented training programs for staff members, and 46 persons successfully completed these programs during Year II.

8. In an effort to provide industrial training to the local manpower, the Center for Permanent Education presented 31 industrial training programs during this year. The programs were oriented to specific needs that had been identified by local industries. A total of 512 persons completed these programs, many of whom were rapidly employed by local small-scale industries.
9. Following the audiovisual document prepared during Year I, the administration of FESSC decided to set up its own audiovisual section. This was accomplished during the year, and staff were trained and necessary equipment was acquired. Later in the year, when the East-West Center/EDL staff team taped the audiovisual document for Year II, the FESSC staff also did its own version of this document, using its own staff and equipment.

10. On-site technical assistance was provided by the EDL staff to the various FESSC projects. The EDL professional staff had 19.5 man-weeks of on-site study during the year. Other members of the EDL staff visited FESSC under the sponsorship of another USAID-funded project.

11. The joint staff also contributed to or participated in some 10 lectures, workshops, and seminars that were presented to small-scale industries and development groups in Santa Catarina.

12. Five major studies were conducted, researched, and published during Year II by the FESSC staff. One of these very comprehensive studies is at present being used by the state government of Santa Catarina as the basis for the new five-year economic development plan for that state. This study was conducted entirely by the FESSC staff under the direction of Econ. Jose Muller, the Counterpart Project Director.

Partial Results of the University of Ife Program (B-455)

Since only six months have elapsed since initiation of this program, it is very difficult to determine all of the results. Several accomplishments are outlined below, and further results and impacts may be anticipated from this program later in 1976.

1. The project plan for the first 12 months was completed and is now being implemented. To date, the project is well on schedule and UI staff members are trying to implement the different tasks for which they are responsible.

2. Nearly eight man-weeks of EDL on-site staff assistance have been provided to the UI staff and additional time is scheduled during the balance of the first year.

3. While on-site, the Project Director assisted the UI staff in selecting two locations for their first two extension offices. The project plan calls for both of these offices to be operational by the end of this program year.
4. A schedule has been completed for an UI staff training program at EDL headquarters in Atlanta during the summer of 1976. The UI administration is selecting the participants for this program.

5. First- and second-quarter reports have been completed by the UI staff, as per the scheduled procedure.

6. Assisted by the UI staff, the Project Director was able to conduct a baseline study while on-site during the second quarter of the project year. The baseline study is now being published and will be made available to the sponsor and other interested parties at the end of program Year I.

7. The taping of an audiovisual documentary has been scheduled for the summer of 1976 in an effort to record the first year of activity.

Conclusions

Continuing the chain of actions initiated during the first year of this project, the administrative project (A-1600) and the three companion projects (B-426, B-427, and B-455) have successfully established three counterpart units in developing countries which are dedicated to the generation and expansion of the small-scale industry sector of their respective nation. The two units which started in 1974 are now actively implementing action-oriented pragmatic industrial programs, and some of the results are presently visible.

These programs have in a direct or indirect manner assisted in generating new industrial jobs, increasing production, augmenting sales, and, in general, "enhancing" a group of small-scale industries in the host countries. As a by-product of this effort, the counterpart institutions are now more capable of providing technical assistance, carrying out research, adapting and transferring appropriate technologies, and conducting industrial training and educational programs.

It is the conclusion of the author that results to date are far greater than originally conceived; however, they are nowhere near the long-range anticipated accomplishments. The three counterpart units are directly involved in serving their local small-scale industry, which was an unheard concept two years back in those particular locations. The counterpart staffs are highly motivated, and most eager to continue providing this type of service to their people and their communities.
SMALL-SCALE INDUSTRY
GRANT
YEAR III

STIMULATING THE GROWTH OF
SMALL-SCALE INDUSTRY

Grant Period: January 10, 1976 to January 9, 1977

A PROGRAM FUNDED BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
FINAL REPORT
YEAR III

STIMULATING THE GROWTH OF SMALL-SCALE INDUSTRY

by
Nelson C. Wall

Project A-1600
Contract No. AID/ta-c-1062

International Programs Division
Economic Development Laboratory
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY
February 1977
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Project B-427--Fundação Educacional do Sul de Santa Catarina (FESSC), Tubarão, Brazil

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Project B-463--University of the Philippines, Institute for Small-Scale Industries (UP/ISSI), Manila, Philippines

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Background

Objectives

Total Project Goals of the AID/ta-c-1062 Contract

Programs of Work

Use of Grant Funds

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Soong Jun University (SJU)

Fundação Educacional do Sul de Santa Catarina (FESSC)

University of Ife (UI)

University of the Philippines, Institute for Small-Scale Industries (UP/ISSI)

Economic Development Laboratory

THREE-YEAR REVIEW

Soong Jun University

Fundação Educacional do Sul de Santa Catarina

RESULTS AND CONCLUSIONS

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INTRODUCTION

The Agency for International Development (AID) initially funded on January 23, 1974, Contract No. AID/ta-c-1062, through which the Economic Development Laboratory (EDL) of the Engineering Experiment Station at the Georgia Institute of Technology was assigned the responsibility of implementing a long-range program of work in the area of stimulating growth of small-scale industry by providing grants to selected counterpart institutions. The administrative portion of this AID contract was assigned internally to the International Programs Division of the EDL and given the project number A-1600 by the Georgia Institute of Technology.

Second and third consecutive years were funded by the sponsor agency. This is the final report for Year III of this project, which has been implemented in four different regions of the world. For Year III, four counterpart institutions were funded: Soong Jun University, Seoul, Korea; the Fundação Educacional do Sul de Santa Catarina, Tubarão, Brazil; the University of Ife, Ile-Ife, Nigeria; and the University of the Philippines, Institute for Small-Scale Industries, Manila, Philippines.

As established by the contract guidelines, the following criteria were used in selecting the counterpart institutions:

1. Suitability of the national macroeconomic framework for local business conditions.
2. Existence of practicing or potential entrepreneurs.
3. Community concern over unemployment.
4. Existence of potential markets for additional products.
5. Linkages (current or potential) with educational, financial, and business communities.
6. Quality of the staff.
7. The institution's potential for utilizing the grant effectively.
8. Potential multiplier effects.
9. Host government commitments.

One of the basic provisions of the AID contract was that linkages or counterpart relationships with organizations in developing countries would be established and four of these counterpart institutions would be funded under the present contract. After reviewing approximately 30 potential counterparts
in 12 countries, the four institutions mentioned above were selected for this project.

Each selected institution prepared and presented its project proposal and later each one became a project (B-426, B-427, B-455, and B-463, respectively). Each project was funded by a $45,000 grant (one year) provided for by Project A-1600.

The terms of the grants to the counterpart institutions permitted the grantee to utilize half of the grant funds for personnel, travel, materials and supplies, conferences, etc. The balance of the funds were to be used by the grantee to obtain training and consultation services from U.S. technical assistance organizations.

The Georgia Institute of Technology subsequently contracted with all four grantees to provide training, consultation, information and data, and audio-visual documentation of the projects. In addition, two of the grantees utilized the services of the East-West Center in Hawaii.

Each individual project has been reported on separately, but in a summary manner some of the immediate results obtained during this third year are the following:

Project B-426--Soong Jun University (SJU), Seoul, Korea

1. Preparation and publication of three case histories based on actual technical assistance cases. A Methodology for Case Study and Case History Preparation also was compiled and published.

2. Provision of management and technical assistance to 33 companies, of which 10 were in Seoul and 23 in Taejon.

3. Seventeen of the firms receiving management or technical assistance this year reported employing 651 at the start of 1976 and had increased employment to 810 persons by the year's end, a gain of 159 jobs.

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1/ For additional details, refer to the respective end-of-the-year report entitled Final Report--Small-Scale Industry Grant for each year and each counterpart named in this document, published by the Economic Development Laboratory, Georgia Institute of Technology, Atlanta, Georgia, January 1974, 1975, and 1976.
4. The SJU staff developed five additional pieces of appropriate technology hardware and eight software applications were recorded.

5. The Small-Scale Industry Information Center (SSIIC) was incorporated into the SJU Engineering Library and reactivated this year.

6. A staff member participated in a four-week training program presented by the Georgia Institute of Technology in Atlanta, Georgia.

7. The EDL staff assisted in reviewing the SJU Department of Industrial Engineering.

8. A training and development seminar for small-scale manufacturers of communication instruments was offered by SJU staff during Year III and 48 persons participated.

9. Completion of the third annual audiovisual documentation of the program. Both new and old cases were documented at this time.

10. The newly appointed Data Manager for the SSIIC received five weeks of training at the East-West Center in Hawaii in the field of data collection and management for rural small-scale industry libraries.

11. A new organizational linkage was bonded with the Korean Communication Instrument Manufacturers Association.

12. Outside financial support grew, with SJU receiving almost $70,000 in research grants from five organizations during 1976.

Project B-427--Fundação Educacional do Sul de Santa Catarina (FESSC), Tubarão, Brazil

1. Preparation and publication of one feasibility study, three prefeasibility studies, and 24 new manufacturing opportunity reports.

2. Provision of management and technical assistance to 45 local small-scale industries in 10 different municipalities. Consultation, information, and limited assistance were provided to another 35 enterprises in the same geographic area.

3. Fifteen of the companies receiving management and technical assistance were surveyed and they reported employing 915 persons at the start of the year; the same companies reported employing 1,911 persons at the end of the year for an increase of 996 jobs. In addition, two new companies were started, generating 80 jobs.
4. The Basic Data Center (CDB) increased its holdings by 2,946 documents during the year, all of which were classified, coded, and added to the collection. Since the flood of 1974 destroyed the CDB, a total of 3,552 documents have been added to the collection, 606 in 1975 and the balance this year. During the year, 106 inquiries for information were made to the CDB by different users, and they also provided all the data support for the preparation of the studies published by FESSC.

5. The FESSC staff presented or participated in 14 conferences, seminars, or lectures during this third program year. Thirteen were held in the state of Santa Catarina and one was in Manila, Philippines.

6. FESSC completed four research studies funded by the federal or state government. These studies are entitled Populações de Baixa-Renda-Condicionamento Social e Necessidades Habitacionais em Santa Catarina; Capacitação de Recursos Humanos para o Sul de Santa Catarina; Modelo Teórico para a Educação de 1º Grau; Plano de Operações do Projeto Litoral Sul de Santa Catarina.

7. Five industry studies were researched, prepared, and published. The topics covered were (a) design of an electric kiln for a ceramic coating process; (b) quality control in the manufacturing of jellies, jams, and candies; (c) distribution system for a manufacturer of nonalcoholic beverages; (d) agro-industrial study on breeding swine, producing and processing broilers, and operating a feed mill; (e) small-scale production of construction materials and cement forms.

8. Presentation of 19 industrial training programs to over 350 participants. Basic skills were taught to the participants, who were training to become welders, electricians, machine fitters, and mechanics, to name a few.

9. Members of the FESSC staff were enrolled and completed 18 different staff training programs during the year. A minimum of 30 persons from FESSC were exposed to these staff training programs, offered in Florianópolis, Blumenau, Criciúma, Joaçaba, and other cities in the project area.

10. Evolution of the Center for Permanent Education (CEP), created in 1974 at the start of this program, into the Department of Permanent Education (DEP). Through the DEP the institution has been providing the training reported under item 8. The CEP presented 112 programs to 2,552 participants in 1974, and the following year (1975), they offered 31 programs to 512 persons; addition of
this year's activities brings the total up to 162 training programs presented to 3,414 persons over the last three years.

11. Completion of the third audiovisual documentary on small-scale industries in Santa Catarina. In the past three years, FESSC has developed its own audiovisual capability and has purchased the necessary equipment to carry out this activity.

12. Financial support has been increased through contributions from sources other than AID. In 1976, FESSC expended $148,139 on this program, of which $45,000 was received from the AID grant fund and the balance of $103,139 was generated by FESSC from three main sources: (a) SUBIN (state agency), (b) sponsored research, and (c) internal funds.

Project B-455--University of Ife (UI), Ile-Ife, Nigeria

The University of Ife (UI) entered the program late in June 1975 and completed its year of activity before the end of Year III.

1. Completion of a baseline study with focus on the industrial sector in the selected area. This study was published under the following title: Small-Scale Industry Grant, Baseline Data-Nigeria Program Area, Georgia Institute of Technology, Atlanta, Georgia, October 1976.

2. Establishment of two field stations--one each at Ile-Ife and Ado-Ekiti. The first field station, at Ile-Ife, was staffed with five persons and the one at Ado-Ekiti with four persons. Through this action, the UI has initiated the first industrial extension field office system in Africa.

3. Provision of on-site management and technical assistance to 53 small-scale industries in the areas of Ile-Ife and Ado-Ekiti. During their first year of operations, the Ile-Ife field office serviced 25 small-scale industries and the Ado-Ekiti field office completed 28 cases of management and technical assistance.

4. Presentation by UI staff of four training programs on the subject of small industry development. A total of 73 government officials occupying small-industry positions in all the states of the Federation attended two of these programs, which were presented in August 1975 at Ile-Ife. Fifty small industrialists and government officials participated in a program, also in August 1975, at Ilorin, and new IRDU staff members attended one in March 1976 at the University of Ife.
5. Planning and implementation of an exhibition of products manufactured by small-scale industries in Nigeria. This exhibition was open to the public from August 25 to August 27, 1975, at the Kwara Polytechnic in the city of Ilorin.

6. Preparation and publication of 16 studies on related aspects of small-scale industry development in Nigeria. These studies were all prepared by members of the UI staff and cover such subjects as: industrial policy, organization, finance, project feasibility, entrepreneurship, and manpower and training. Titles of all these studies appear in the 1976 yearly report of the project published by the Georgia Institute of Technology.

7. Preparation and publication of operation guidelines for the field stations and a brochure on the services available through the Management and Extension Division for small-scale industries in the project area.

8. Development of staff for the Industrial Research and Development Unit (IRDU) of the UI. Two senior members of IRDU participated in a seminar presented by the Centre for Management Development (CMD) at Benin City in September 1975. Another staff member attended the "Train the Trainers Course" offered in Lagos by the Industrial Training Fund. The head of IRDU also attended the Mini-Conference on Adaptive Technology and Small Industry Development presented by the Georgia Institute of Technology and the University of the Philippines, Institute for Small-Scale Industries in Manila, Philippines, on May 26-29, 1976. Three additional staff members received training from EDL staff on site during the program year.

9. Assisted by EDL staff on site, the first year audiovisual documentary was completed. A selected group of small-scale industries in both Ile-Ife and Ado-Ekiti were included in the tapes filmed at this time.

10. Financial support has been provided by UI from sources other than AID. In 1976, UI reported disbursing $321,274 on this program, of which $45,000 was granted from this program and the balance of $276,274 was provided by the Nigerian government and UI internal funds.
This institution entered into the program early in January 1976. At the end of their first program year, the following results have been obtained:

1. A baseline study with focus on the industrial sector of the region being served by the extension office of UP/ISSI was completed. This document was published under the following title: *Small-Scale Industry Grant, Baseline Data, Philippines Program Area*, Economic Development Laboratory, Georgia Institute of Technology, Atlanta, Georgia, December 1976.

2. The first industrial extension office was opened in Tacloban City, Leyte, with seven staff members. This is the first industrial extension service facility to be established in the Philippines.

3. The Tacloban City extension office serviced 14 technical assistance cases in this first year of operations. Two of the cases were from the public sector and the other 12 from the private sector. In addition, the extension office responded to an additional 15 technical assistance inquiries and established coordination with seven agencies or organizations in the region.

4. An item of appropriate technology hardware was developed. The staff of the Tacloban City extension office designed and fabricated a feed mixer from a 55-gallon drum. The development of appropriate technology hardware is an area of great potential benefit to the small-scale Filipino farmers.

5. A survey of the training needs of entrepreneurs located in Tacloban City was conducted and the results will be used in planning future industrial training programs.

6. Five members of the UP/ISSI staff received special training during the year. Two of these persons visited the Technology and Development Institute of the East-West Center, Honolulu, Hawaii, for a four-week training program presented for the Asian RATC/SID Centers. The other three persons participated in training programs offered by the Economic Development Laboratory of the Georgia Institute of Technology in Atlanta, Georgia. Details of the coursework are presented in the corresponding end-of-the-year report for Project B-463.

7. Additional staff training was provided on site to seven members of the UP/ISSI staff by EDL staff members. The training was oriented to the operation of the extension office and general administrative procedures.
8. Research concerning industrial opportunities in the region was conducted in cooperation with the Regional Industrial Development Executives Course of UP/ISSI. In cooperation with the Small Business Advisory Center (SBAC) of the Department of Industry, industry studies are being prepared on the coconut, fishing, and wood-based industries.

9. The first-year audiovisual documentary for the project was completed. Assisted by the East-West Center staff on site, the UP/ISSI completed documentation (videotape and still photographs) of a selected group of small-scale industries in the project area.

The sections presented hereafter fully describe the background, objectives, and overall activities of the Year III program. The report also highlights some of the results attained by the project staff and the conclusions reached by the Project Director and staff.
Background

The Economic Development Laboratory (EDL) of the Engineering Experiment Station at the Georgia Institute of Technology, a nonprofit organization, has been in existence since 1956. This internationally known unit of Georgia Tech now has an interdisciplinary staff of 75 persons and a broad and diversified program of economic development activities. It was created to provide the research and technical services required to accelerate the economic growth of the state of Georgia.

The Laboratory's broad program of industrial and economic development research, service, information, and training covers 10 major fields of activity: area development, community development, market analysis, industrial economics, management and technical assistance to industry, technical information services and technology transfer, manpower resources, basic data collection and dissemination, industrial and economic development training, and international development services. Special studies relating to natural resources, plant location, industrial land use, and industrial development program planning also are conducted.

In the spring of 1964, the then Industrial Development Division (IDD) became interested in the possibility of establishing an international program as a natural extension of its development work in process and previously carried out in port cities and adjacent coastal areas, particularly in Savannah and Brunswick, Georgia. In further investigating this idea, it became apparent that at the time there were few, if any, universities in this country which were actively engaged in training Latin American students in the basic principles and methodologies of industrial development.

Having recognized the need for and potentials of a sound program of industrial development for the emerging nations, especially in Latin America, the Economic Development Laboratory added to its professional staff bilingual personnel with extensive industrial experience in both Latin America and the United States.

The International Programs Division (IPD) of the Economic Development Laboratory then began to draw on the experience gained by EDL during its earlier years through the broad-gauged industrial development programs operated in
Georgia. In 1972, after a series of successful AID-sponsored projects in Latin America, the Economic Development Laboratory was awarded an AID 211(d) grant.

It was under this grant (Project B-414) that EDL identified the need for stimulating the growth of small-scale industries in less-developed countries (LDC). In an attempt to respond to this identified need, EDL prepared a proposal under the title of "Stimulating Growth of Small-Scale Industry," which was submitted to AID for consideration on October 15, 1973. Early the following year (January 23, 1974), the proposal was accepted and funded by AID, and the administrative portion of the contract became Project A-1600 at the Georgia Institute of Technology.

The EDL staff had identified the general problems associated with the expansion and diversification of existing industries and the creation of new small industries in the following manner:

1. Lack of a system analysis approach to providing research, services, and information to industry.
2. Insufficient funding to expand industrial assistance activities.
3. Continuing need for training of more organizational staff personnel.
4. Lack of knowledge of pragmatic methodologies.
5. A deficient information base related to technical and management problems of small-scale industries.

The Economic Development Laboratory suggested a program that would attempt to cope with these problems. Some of the basic elements suggested in the proposal were:

1. An organization focus with clearly defined aims.
2. A well-trained and motivated staff.
3. An information base.
4. A technical assistance "delivery system."

When this program was funded by AID, Project A-1600 was created to serve as the administrative project, and $45,000 grants were made to each of the counterpart institutions. Mr. Nelson C. Wall, Head of the International Programs Division, is Project Director on A-1600.

The terms of the grants to counterpart institutions permitted the grantee to utilize half of the grant funds for personnel, travel, materials and
supplies, conferences, etc. The balance of the funds were to be used by the grantee to obtain training and consultation from U.S. technical assistance organizations.

Both the Georgia Institute of Technology and the Technology and Development Institute, East-West Center, subsequently contracted with the grantee to provide training, consultation, and audiovisual documentation of the project.

The four counterpart institutions funded during Year III by this project may be briefly described in the following manner:

**Soong Jun University.** Soong Jun University was formed in 1970 when Soong Sil College united with Taejon College to form a new cooperative venture in the field of Christian education. Soong Sil College, in turn, was formed in Pyeng Yong (North Korea) in 1897 and reopened in Seoul in 1954, after being closed in 1938 during the Japanese occupation. Taejon Presbyterian College was founded in 1956 by the Southern Presbyterian Mission in the city of Taejon.

The main campus is located in Seoul near the large industrial area of Young Dung Po, which has a population of about 1.5 million inhabitants. The second campus at Taejon is near a smaller industrial area with a population of about 450,000 persons.

Immediately after Dr. Hahn Been Lee became President of Soong Jun University in March 1973, contacts were made by Mr. Ross W. Hammond, Director of the Economic Development Laboratory, with Dr. Lee. As a result of these contacts, both institutions entered into an agreement of mutual cooperation on July 30, 1973.

**Fundação Educacional do Sul de Santa Catarina.** The Fundação Educacional do Sul de Santa Catarina (FESSC) is an autonomous entity, as established by the Civil Code and national legislation under Decree Laws 200 and 900. It was constituted by Municipal Law No. 443-67 of October 18, 1967. It was recognized as being of utility to the federal government by Decree No. 70.680 of June 7, 1972.

FESSC has the following objectives: (1) develop middle and higher education as required by the labor market, which is to be done by formal and informal course work; (2) promote education and research related to the development of the state of Santa Catarina; and (3) engage leadership and population in the process of self-promotion to develop the local and regional areas.
Since early 1972, FESSC and Georgia Tech's Economic Development Laboratory (EDL) had been jointly studying the possibilities of initiating a joint program of work. As a result of these early deliberations, both institutions officially entered into an agreement on March 11, 1972. The agreement established that the signatories, as centers of higher education, have common interests in both local and regional development and in the development of students at a professional level for the area of South Santa Catarina. The agreement also provided for the cooperative promotion of programs, projects, and activities, with the understanding that other organizations may participate.

FESSC then presented a proposal to the Georgia Institute of Technology entitled "Program of Development for Small and Medium Industries." It was implemented by a grant funded under this contract, which was provided to the Georgia Institute of Technology by the Agency for International Development (AID) for this purpose.

In 1974, the Economic Development Laboratory, in cooperation with FESSC, initiated Year I of a program of small-scale industry development. This program was expanded in 1975 (Year II) and 1976 (Year III), again under funding by the Agency for International Development.

University of Ife. The University of Ife was established by the government of the Western State of Nigeria in October 1961. It is financed by the federal and the state governments on a 40%-60% basis. The university admitted its first students in October 1962, and the Department of Economics in the Faculty of Social Sciences was one of the earliest departments to be set up.

The University of Ife is located in the heart of the agricultural area of western Nigeria. It is committed to a close identification with, and improvement of, the agricultural, commercial, industrial, and cultural activities of the population around it.

In its research commitments, therefore, the university places a great emphasis on relevant applied research, without sacrificing the necessary theoretical and fundamental research. It is in this spirit that the University of Ife has set up research programs on (1) population and manpower, (2) drugs, (3) customary laws, (4) coal and allied minerals, (5) human resources, (6) Kainji Dam problems, (7) agricultural extension and implementation, and (8) small and medium-scale industries. All these are action-oriented programs and are designed to bring community problems into day-to-day analysis and investigation by University of Ife scholars, on a teamwork basis.
The Industrial Research and Development Unit (IRDU) was set up by the Department of Economics in August 1969 and at present serves as the counterpart unit in this project. The IRDU has the following main objectives:

1. The continuance of information gathering with a view to performing academic study, analysis, and interpretation of the data collected. The unit proposes to build up a data bank and materials for teaching and research.

2. Establishment of an effective industrial extension service to assist the existing industries to develop, grow, and modernize their operations and to create a linkage between them and the large industries, on a functional basis.

3. The encouragement of community industries through close liaison between the unit and the communities that have raised, or will raise, money to set up community enterprises.

In July 1975, the Economic Development Laboratory, together with the University of Ife, initiated Year I of a program of small-scale industry development. The program was continued in 1976 (Year II) under the same grant.

University of the Philippines. The University of the Philippines Institute for Small-Scale Industries (UP/ISSI) has directed its efforts since 1966 to the support of small-scale industry and entrepreneurial development in the Philippines, concerning itself particularly with appropriate support for rural development.

The UP/ISSI activities have included, in behalf of the Philippine small-scale industry, such matters as management training, in-plant technical assistance support, entrepreneurial development, management and technical data development and dissemination, as well as the continuing and successful advancement of its own professional and executive capacities.

In August 1975, a request for assistance in the establishment of a pilot rural extension office for small and medium industries was made by UP/ISSI to the Economic Development Laboratory of the Georgia Institute of Technology. The widening of the ISSI professional capacities and, particularly, the intensification of its programs for direct rural development activity was in response to government executive directives to government operating agencies to intensify efforts for the establishment of appropriate industries in regions outside the Greater Manila area.

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This counterpart entered the program in January 1976. Since then, the development of further Government of the Philippines support to permit UP/ISSI to widen and direct its capacities to rural objectives has been abetted by this grant and by the technical cooperation of the Georgia Institute of Technology.

Objectives

At the initiation of this program, the continuing objectives were clearly defined, and they have been reviewed by the sponsor at each of two comprehensive reviews conducted since January 10, 1974. The objectives are threefold and are best described in the following manner:

1. To encourage selected developing country organizations to focus on employment generation through programs which accelerate the expansion of existing industry and the creation of new small industries.

2. To demonstrate and document the impact of alternative approaches to the stimulation of small industry.

3. To create in the appropriate governmental, industrial, and financial sectors of small industry an awareness of potentials and ways to maximize these potentials.

Each of the four counterpart projects (B-426, B-427, B-455, and B-463) have their own specific objectives which coincide with the overall project philosophy of the main program (A-1600). To insure compliance with these program objectives, the project administration established two main areas of activity for the Economic Development Laboratory staff: (1) training of selected counterpart staff both on site and in the U.S.A. and (2) provision of on-site consultative services to the different programs implemented by the grantee institutions. It was also established that the EDL project staff would assist the counterpart personnel in providing managerial, engineering, scientific, and technical assistance to selected small and medium-size industries in the participating host countries. The established objectives for Year III were met during this contract year.

Total Project Goals of the AID/ta-c-1062 Contract

The project goals were delineated by the Agency for International Development at the start of the Small-Scale Industry Grant on January 23, 1974. The
established goals, to be achieved over a period of four years, are as follows:

The general objective of this contract is to generate employment in developing countries, particularly outside the metropolitan centers, by:
(a) strengthening the capability of a selected institution in each country to provide effective technical assistance to local small industry, (b) demonstrating and documenting the impact of alternative approaches to technical assistance to small industry, and (c) infusing the governmental, industrial, and financial sectors of the local community selected to provide employment with the understanding of the techniques of generating jobs. The above objective will be carried out through the use of grants to selected Lesser Developed Country (LDC) organizations.

Once the total project goals are reached, the sponsor anticipates the following outputs:

1. Increased job opportunities in four countries.
2. Increased viability of indigenously owned enterprises.
3. Improved capability of four LDC institutions to serve small industry.
4. Tested methodologies for strengthening LDC institutions.
5. Evaluation reports on successes and failures in assisting small industry.

The total project goals have been met over the past three years plus several additional accomplishments during Year III which are listed in the Introduction and will be presented in further detail in the balance of this end-of-the-year report.

Programs of Work

Under Project A-1600, the role defined for the Georgia Institute of Technology was that of administering the overall project, providing guidance to the participating institutions in the development and design of their programs, providing advice and counsel as needed, and suggesting alternative options, all leading to the enhancement and assurance of positive results, as established by the project goals.

The EDL Project Director then generated for Year III a suggested program for each counterpart institution. These suggested programs were modified by the Counterpart Project Directors and their staffs to meet their own objectives and established needs. In order to create some degree of comparison and to
establish criteria comparable to all projects, the suggested counterpart program recommended the following activities:

1. **Counterpart Organization Functional Activities**
   
a. **Organization.** The counterpart will administratively designate a unit to mount a program of research, service, training, and technical information for the small industry sector. Staff personnel will design the program based on the organization's goals and motivations.

b. **Facilities and Staff.** The counterpart will provide adequate office, equipment, and other resources to the designated unit to permit its staff to function effectively. Staff personnel who have appropriate backgrounds and who, with appropriate training, can implement the program of assistance will be assigned to the unit.

c. **Technology Transfer.** An information collection will be established by the counterpart, where one does not exist already, to permit the staff to conduct research on industrial problems, needs, processes, and products, especially as they relate to small-scale industry, and to disseminate technical information.

d. **Delivery System.** The counterpart will design and implement a procedure to permit direct contact with small industries and entrepreneurs for the purpose of ascertaining their needs and problems and for the provision of staff assistance and research in the solution of problems, both management and technical in nature. This industrial extension activity will have as its aim the establishment of new industry and the expansion and diversification of existing industry.

e. **Education and Training.** The counterpart will design and deliver appropriate training programs related to small-scale industry. Educational programs related to industrialization will be encouraged.

2. **Independent Continuing Activities.** The counterpart will design, in cooperation with the EDL Project Director, a specific program of continuing
activities which should include, but not be limited to, the following major subject areas:

a. **Research Activities.** For example, this could be in the areas of:
   1. preparation of case histories;
   2. approaches leading to employment generation;
   3. analysis, evaluation, and development of new industrialization techniques (if appropriate), products, and processes. Other research activities also will be considered.

b. **Industrial Extension Activities.** This should be a pragmatic type of program related directly to serving the new and existing small-scale industries. Sample activities would be:
   1. industrial problem-solving;
   2. advice to and consultation with industry;
   3. survey of small-scale industry problems and needs.

c. **Training Activities.** The counterpart institution should consider the possibility of providing on-site training to persons in industry. This training may be to management, supervisors, or employees, as needed. Some sample subjects to be considered are:
   1. market analysis,
   2. small industry operation,
   3. industrial processes.

d. **Educational Activities.** This is an option, but if the counterpart is an educational institution, it is highly recommended.

e. **Training and Consultation.** This task will be the responsibility of the EDL staff. As needed, selected counterpart institution staff will receive appropriate training at the EDL headquarters in Atlanta, Georgia. The training may take various forms as appropriate, including classroom work, on-the-job training, consulting and advisory services, plant tours, and other pertinent topics.

Using the established program guideline, the individual counterpart institutions then developed their corresponding programs for this year. The individual programs are summarized as follows:

**B-426—Soong Jun University (SJU)**

1. **Organization.** The counterpart project administration had recognized during Year II that the inactivity of the Small-Scale Industry Information Center (SSIIC) was limiting the program and it was established that during Year III the SSIIC was to be reestablished and activated.
2. **Staff and Physical Plant.** Unfortunately, at the end of Year I the person on the SJU staff responsible for the SSIIC left SJU and he had not been replaced since that time. It was planned for Year III to find and train (if necessary) a person to assume these duties. The SSIIC, when activated, would probably be incorporated into the collection at the Department of Industrial Engineering so space allocation was also planned for this action.

3. **Program Areas.** In cooperation with SJU, the Project Director designed the program of work for Year III. In a summary manner, the program of work was as follows:

   a. **Industrial Training and Education.** For the past two years several successful short-term training programs had been offered to industry managers, engineers, and entrepreneurs in general. This activity would be continued during Year III. The programs proposed for Year III would include: (1) training seminars involving an interchange of SJU and EDL professional staff, (2) assessment of the joint program on science and engineering education at SJU, (3) management seminars on site for interested small-scale industries, and (4) additional staff training as needed.

   b. **University Training and Education.** The new Industrial Engineering Department became established at SJU in part because of the assistance provided by the program during Years I and II. During this third year, the EDL staff would be made available as needed for further consultation in areas such as: (1) preparation of classroom material and coursework for the program leading to a degree in industrial engineering, (2) review and modification of the departmental curriculum, and (3) identification of specific effects on university education policies and practices as a result of these industry-oriented educational programs.

   c. **Industrial Extension and Research Service.** Now that this portion of the program has been securely established at both the Seoul and Taejon campuses, it was proposed that for Year III these activities would be implemented: (1) further development of chemical and electrical engineering capacities; (2) expansion of the industrial engineering and management assistance facilities at both the Seoul and Taejon campuses; (3) increased emphasis on the subjects of quality control, plant and production management and marketing; (4) special emphasis on energy management in the program of technical assistance to small-scale industries. The joint staff would review and implement, if
possible, the use of solar energy applications on behalf of small-scale industry users.

d. Audiovisual Documentation. As in the previous two years, plans were made for the taping of an audiovisual document representative of the activities implemented during this year and a review of some of the previous activities.

B-427--Fundação Educacional do Sul de Santa Catarina (FESSC)

1. Organization. The counterpart institution had recognized during Year II that the existing organizational structure no longer covered the needs of the institution and designed a new structure for implementation during Year III. It was further understood that the Center for Permanent Education (CEP), created during Year I of this program, would complete its evolution and spin off to become the Department of Permanent Education (DEP).

2. Staff and Physical Plant. Based on the needs of the different program units, FESSC had hired an industrial engineer at the end of Year II who brought the program staff up to 12 persons. This did not include the staff of the Basic Data Center, Center for Permanent Education, or the Counterpart Project Director and his staff.

Plans had been under way for two years for the expansion of the existing physical facilities at FESSC. The goal for Year III was to complete the "New Campus Plan" and present it to the proper authorities in Brazil.

3. Program Areas. The EDL Project Director and his counterpart at FESSC jointly designed a program to assure the necessary support in the implementation of the following activities over a 12-month period:

a. Basic Data Center (CDB). During Year I, the CDB had lost nearly all of its holdings as a result of the March 1974 flood. In Year II, 606 documents had been added to the CDB collection, which was equivalent to doubling existing holdings. For Year III, it was planned to continue expanding the collection of information of social, economic, industrial, and technological origin. As part of the program, it was planned to step up the interaction between CDB and other national and international collections that are active in the field of small-scale industry development. The CDB would continue to be oriented to the collection, classification, and dissemination of pragmatic, up-to-date information on Brazilian and international material relevant to small-scale industries.
b. Center for Management and Technical Assistance (CETEG). This "delivery system" had been established during Year I and by now it had become very strong and well-developed. This action-oriented unit planned to continue to provide management and technical assistance to 12 companies on a continuous basis and to 40 additional companies on an "as needed" basis. The staff also planned to research and conduct four feasibility studies, 12 manufacturing opportunity studies, two small-scale industry case histories, and develop at least one management guideline for small-scale enterprises.

c. Center for Permanent Education (CEP). As in the past two years, the FESSC staff would assist in the presentation of short courses, lectures, workshops, industrial training programs, and staff training courses. For this year, three training programs were planned, as well as two lecture series. Industrial training programs were tentatively planned, subject to government approval. During the year, CEP would spin off and become the Department of Permanent Education if the proposed plan was successful.

d. Adaptive Technology Center (CATT). This center was established during Year I as an interim step leading to the future establishment of "technological education" as one of the educational options offered at FESSC. Plans for Year III included modest growth and the addition of two professionals to the staff--an industrial engineer and a chemical engineer. Plans also called for the establishment of a modest chemistry laboratory. Technical courses would be started during this year for the university students and the high school students. The CATT staff would continue to provide the technical backup to the technical assistance cases.

B-455--University of Ife (UI)

1. Organization. Year I activities at UI were initiated with the selection of the existing Industrial Research and Development Unit (IRDU) as the base unit for the program. The Counterpart Project Director then assigned specific responsibilities to the different groups within IRDU and they assumed the task of implementing the program components. During the year, as the program evolved, new organizational needs were identified and changes implemented to best serve the project and the small industries in the project area.

2. Staff and Physical Plant. As needed, the staff was to be enlarged to man the planned expansion. The candidates were to be considered and selected on the basis of interest, capability, and motivation to carry out the planned
tasks. Based on the needs of the different groups involved in the program, it was also necessary to allocate appropriate office space and equipment to assure the logistical support necessary to the implementation of the program.

3. Program Areas. The Counterpart Project Director, in cooperation with the EDL staff, designed a program to support the implementation of the following activities for the year:

a. Establishment of an Extension Service. A primary objective for this year of the IRDU program was to establish an industrial extension service. Two field stations were programmed— one each in Ile-Ife in Oyo State and Ade-Ekiti in Ondo State. As part of this action, operating procedures, guidelines, and other documents needed by the field offices also would be generated.

b. Preparation of Baseline Study. The compilation of selected baseline data on a national and regional basis for Nigeria was necessary in order to establish a benchmark. It was planned to conduct this study during the first quarter of the year. The primary sources for the information would be the annual publications of the national government; this information would be expanded through updated data which would be gathered on each industry or group of industries known to IRDU.

c. Management Development Division. This existing component of IRDU was to be strengthened to make it capable of assuming the administration and operation of the industrial extension services. During the year, a brochure describing the services offered also would be published.

d. Industrial Training and Education. The first priority was the development of a specific short-term training program for the IRDU staff. The counterpart staff, in the meantime, would offer industrial training programs, workshops, and seminars to government officials, interested persons, and the general public, as needed. Short-term training at EDL headquarters in Atlanta was also planned for the "senior" staff members of IRDU.

e. Technical Assistance. The counterpart staff requested, in particular, that during this first year EDL would make available to the program its much-needed industrial engineering expertise. IRDU plans in the future to develop its own in-house technical capability, but this would have to be provided by EDL during this initial phase.
1. **Organization.** This institution started its first year in the program during 1976. The Counterpart Project Director decided to initiate the program within the existing organizational framework at UP/ISSI, and specific administrative units were designated to assume the responsibility for the portions of the program relating to research, service, training, and technical information.

2. **Staff and Physical Plant.** The program included the expansion of existing facilities to house the planned field office staff. The different units participating in the program were allocated appropriate staff space and equipment to assure the required logistical support.

3. **Program Areas.** In cooperation with the Project Director, the UP/ISSI administration and staff designed the program of activities to be implemented during the year. The establishment of an extension office within the campus facilities of the University of the Philippines, Tacloban City, Leyte, was given the highest priority. Tacloban City was chosen as the location of the first extension office because it is the political, communications, and commercial center of Region VIII. The Government of the Philippines has selected Region VIII as a priority area for development, and at Tacloban City UP/ISSI has many former participants of the Entrepreneurship Development Program that are eager to assist in the development of the program.

Training activities were planned for the extension office in such areas as: (a) management and technical courses, (b) seminar for selected industrial activities, and (c) seminar for entrepreneur development.

The extension service would provide technical support to the small industries in Region VIII. Typical services would include: (a) response to general inquiries via reports, relevant publications, and direct professional face-to-face response, (b) general management and technical assistance and consultancy on site, (c) feasibility studies oriented to the development of new enterprises, and (d) entrepreneur support, particularly to those establishing new enterprises.

During the early part of the year, a baseline study would be conducted to gather support data on the region, all of which would serve as a benchmark for evaluation of results of project activity. Plans were also made for UP/ISSI staff training both on site and at EDL headquarters in Atlanta, Georgia.
The four counterpart programs outlined above are described in full in the following reports:

Yoon Bae Ouh and Donald E. Lodge, Final Report, Year III--Soong Jun University, Small-Scale Industry Grant, Georgia Institute of Technology, Project B-426 Report, Atlanta, Georgia, 1977.

Jose Muller and Nelson C. Wall, Final Report, Year III--Fundação Educacional do Sul de Santa Catarina, Small-Scale Industry Grant, Georgia Institute of Technology, Project B-427 Report, Atlanta, Georgia, 1977.

Sam A. Aluko and Nelson C. Wall, Final Report, Year I--University of Ife, Small-Scale Industry Grant, Georgia Institute of Technology, Project B-455 Report, Atlanta, Georgia, 1977.

Herminia Fajardo and Donald E. Lodge, Final Report, Year I--University of the Philippines, Institute for Small-Scale Industries, Small-Scale Industry Grant, Georgia Institute of Technology, Project B-463 Report, Atlanta, Georgia, 1977.

Use of Grant Funds

Each of the four grantees was funded for a one-year period in the amount of $45,000. Disbursements of these funds are shown in Tables 1, 2, 3, and 4 respectively for the four counterpart institutions.
Table 1
DISBURSEMENT OF GRANT FUNDS
SOONG JUN UNIVERSITY
YEAR III
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Funds by Source</th>
<th>AID(^1)</th>
<th>Ind. Univ.(^2)/Foundation</th>
<th>SJU(^3)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Salaries and Wages</td>
<td></td>
<td>$9,952</td>
<td>$5,250</td>
<td>-</td>
<td>$15,202</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td></td>
<td>4,500</td>
<td>-</td>
<td>-</td>
<td>4,500</td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td>2,474</td>
<td>750</td>
<td>-</td>
<td>3,224</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td></td>
<td>3,647</td>
<td>-</td>
<td>-</td>
<td>3,647</td>
</tr>
<tr>
<td>Conferences and Seminars</td>
<td></td>
<td>1,927</td>
<td>-</td>
<td>-</td>
<td>1,927</td>
</tr>
<tr>
<td>Contracted Services (GIT/IDC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SJU Personnel Training</td>
<td></td>
<td>10,500</td>
<td>-</td>
<td>-</td>
<td>10,500</td>
</tr>
<tr>
<td>EDL Consulting</td>
<td></td>
<td>10,000</td>
<td>-</td>
<td>-</td>
<td>10,000</td>
</tr>
<tr>
<td>TDI (E-W Center)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td></td>
<td>2,000</td>
<td>-</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>SJU Indirect Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Overhead</td>
<td></td>
<td>-</td>
<td>-</td>
<td>$8,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Technical Service Support</td>
<td></td>
<td>-</td>
<td>-</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>$45,000</td>
<td>$6,000</td>
<td>$11,000</td>
<td>$62,000</td>
</tr>
</tbody>
</table>

\(^1\)From AID Small-Scale Industry Grant.

\(^2\)The Industry-University Cooperation Foundation is an organization in Korea designed to promote mutual cooperation from which SJU applied for and received a grant.

\(^3\)Normal overhead allowance plus depreciation allowance for use of university labs and workshops.
Table 2
DISBURSEMENT OF GRANT FUNDS
FUNDAÇÃO EDUCACIONAL DO SUL DE SANTA CATARINA
YEAR III
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>AID(^1/)</th>
<th>Cost Sharing-FESSC(^2/)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Services</td>
<td>$17,000</td>
<td>$ 73,789</td>
<td>$ 90,789</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>500</td>
<td>3,191</td>
<td>3,691</td>
</tr>
<tr>
<td>Travel</td>
<td>2,000</td>
<td>4,152</td>
<td>6,152</td>
</tr>
<tr>
<td>Contracted Services</td>
<td>-</td>
<td>3,204</td>
<td>3,204</td>
</tr>
<tr>
<td>Publications (Purchased)</td>
<td>1,000</td>
<td>3,495</td>
<td>4,495</td>
</tr>
<tr>
<td>Local Consultants</td>
<td>-</td>
<td>4,610</td>
<td>4,610</td>
</tr>
<tr>
<td>Contracted Services from GIT/EDL</td>
<td>22,500</td>
<td>-</td>
<td>22,500</td>
</tr>
<tr>
<td>Audiovisual</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Overhead</td>
<td>-</td>
<td>9,456</td>
<td>9,456</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>1,242</td>
<td>1,242</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>$45,000</td>
<td>$103,319</td>
<td>$148,139</td>
</tr>
</tbody>
</table>

\(^1/\) From AID Small-Scale Industry Grant.

\(^2/\) Cost-Sharing funds were distributed as follows:

- **SUBIN (state agency)**: 22.98% of total
- **FESSC**: 31.22% of total
- **Contracts**: 15.42% of total
Table 3

DISBURSEMENT OF GRANT FUNDS
UNIVERSITY OF IFE
YEAR I
(in naira)

<table>
<thead>
<tr>
<th>Sources of Funding</th>
<th>University of Ife</th>
<th>Federal and State</th>
<th>AID</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal Services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Director of Unit (Nominal Allowance)</td>
<td>10.00</td>
<td>-</td>
<td>-</td>
<td>10.00</td>
</tr>
<tr>
<td>Head, Management Division (Nominal Allowance)</td>
<td>-</td>
<td>500.00</td>
<td>-</td>
<td>500.00</td>
</tr>
<tr>
<td>Head, Training Division (Nominal Allowance)</td>
<td>-</td>
<td>500.00</td>
<td>-</td>
<td>500.00</td>
</tr>
<tr>
<td>Senior Research Fellow</td>
<td>6,895.00</td>
<td>-</td>
<td>-</td>
<td>6,895.00</td>
</tr>
<tr>
<td>Research Fellows &amp; Senior Extension Officers</td>
<td>5,350.00</td>
<td>12,248.00</td>
<td>-</td>
<td>18,598.00</td>
</tr>
<tr>
<td>Research Assistants or Extension Officers</td>
<td>5,560.00</td>
<td>12,000.00</td>
<td>-</td>
<td>17,560.00</td>
</tr>
<tr>
<td>Administrative Officer or Assistant Extension Officers</td>
<td>2,780.00</td>
<td>9,000.00</td>
<td>-</td>
<td>11,780.00</td>
</tr>
<tr>
<td>Technical Assistants</td>
<td>-</td>
<td>44,008.00</td>
<td>-</td>
<td>4,008.00</td>
</tr>
<tr>
<td>Stenographers</td>
<td>1,370.00</td>
<td>1,728.00</td>
<td>-</td>
<td>3,098.00</td>
</tr>
<tr>
<td>Typists I &amp; II</td>
<td>900.00</td>
<td>2,328.00</td>
<td>-</td>
<td>3,228.00</td>
</tr>
<tr>
<td>Office Analysts</td>
<td>2,700.00</td>
<td>2,328.00</td>
<td>-</td>
<td>5,028.00</td>
</tr>
<tr>
<td>Field Assistants</td>
<td>2,700.00</td>
<td>-</td>
<td>-</td>
<td>2,700.00</td>
</tr>
<tr>
<td>Office Assistants or Office Attendants</td>
<td>900.00</td>
<td>1,632.00</td>
<td>-</td>
<td>2,532.00</td>
</tr>
<tr>
<td>Drivers</td>
<td>1,800.00</td>
<td>2,328.00</td>
<td>-</td>
<td>4,128.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30,965.00</td>
<td>19,600.00</td>
<td>-</td>
<td>80,565.00</td>
</tr>
<tr>
<td>Add Benefits (15%)</td>
<td>4,644.75</td>
<td>7,440.00</td>
<td>-</td>
<td>12,084.75</td>
</tr>
<tr>
<td><strong>Materials &amp; Supplies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension Activities - Ife</td>
<td>6,000.00</td>
<td>1,250.00</td>
<td>4,750.00</td>
<td>12,000.00</td>
</tr>
<tr>
<td>Extension Activities - Ado-Ekiti</td>
<td>6,000.00</td>
<td>1,250.00</td>
<td>4,750.00</td>
<td>12,000.00</td>
</tr>
<tr>
<td>Printing &amp; Stationery</td>
<td>6,000.00</td>
<td>4,000.00</td>
<td>-</td>
<td>10,000.00</td>
</tr>
<tr>
<td>Books &amp; Journals</td>
<td>500.00</td>
<td>600.00</td>
<td>-</td>
<td>1,100.00</td>
</tr>
<tr>
<td>Fellowship &amp; Training Courses</td>
<td>-</td>
<td>6,500.00</td>
<td>2,500.00</td>
<td>9,000.00</td>
</tr>
<tr>
<td>Office Furniture</td>
<td>-</td>
<td>6,000.00</td>
<td>-</td>
<td>6,000.00</td>
</tr>
<tr>
<td>Office Rental</td>
<td>-</td>
<td>2,000.00</td>
<td>-</td>
<td>2,000.00</td>
</tr>
<tr>
<td>Maintenance of Office Equipment &amp; Vehicles</td>
<td>-</td>
<td>5,000.00</td>
<td>-</td>
<td>5,000.00</td>
</tr>
<tr>
<td>Field Supervision &amp; Local Trips</td>
<td>-</td>
<td>-</td>
<td>1,500.00</td>
<td>1,500.00</td>
</tr>
<tr>
<td><strong>Scientific &amp; Technical Equipment</strong></td>
<td>15,890.00</td>
<td>12,900.00</td>
<td>-</td>
<td>28,790.00</td>
</tr>
<tr>
<td>Georgia Institute of Technology Consultancy Costs 1/</td>
<td>-</td>
<td>-</td>
<td>13,500.00</td>
<td>13,500.00</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>N69,999.75</strong></td>
<td><strong>N96,540.00</strong></td>
<td><strong>N27,000.00</strong></td>
<td><strong>N193,539.75</strong></td>
</tr>
</tbody>
</table>

1/ The GIT personal services include the authorized overhead and retirement.

2/ From AID Small-Scale Industry Grant.

Note: For this calculation the rate of exchange used was $1.66 = 1 naira.
Table 4
DISBURSEMENT OF GRANT FUNDS
UNIVERSITY OF THE PHILIPPINES
INSTITUTE FOR SMALL-SCALE INDUSTRIES
YEAR I
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>UP/ISSI</th>
<th>GIT$</th>
<th>TDI/E-W Center1/</th>
<th>Total 2/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Services</td>
<td>$4,200</td>
<td>$14,060</td>
<td>$2,000</td>
<td>$22,500</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>1,300</td>
<td></td>
<td></td>
<td>1,300</td>
</tr>
<tr>
<td>International</td>
<td>5,600</td>
<td>3,840</td>
<td></td>
<td>9,440</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>3,300</td>
<td>2,600</td>
<td></td>
<td>5,900</td>
</tr>
<tr>
<td>Equipment</td>
<td>8,100</td>
<td></td>
<td></td>
<td>8,100</td>
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<tr>
<td>Total</td>
<td>$22,500</td>
<td>$20,500</td>
<td>$2,000</td>
<td>$45,000</td>
</tr>
</tbody>
</table>

1/ Includes the authorized GIT overhead and retirement charges.
2/ Contract with East-West Center for audiovisual documentation.
3/ From AID Small-Scale Industry Grant.
GENERAL ACTIVITIES DURING PROGRAM YEAR III

In the Introduction section of this report, it was indicated that Project A-1600 was established by the Georgia Institute of Technology as the administration project and all implementation would be carried out under the four companion projects—B-426, B-427, B-455, and B-463. It was considered necessary by the Project Director to structure this final report in such a manner as to permit this section to highlight some of the relevant activities implemented by the counterpart institutions.

Soong Jun University (SJU)

Highlights of SJU's Year III activities are presented below. SJU's accomplishments are described in greater detail in a separate report (B-426).

1. Industrial Training and Education. Under the program, the Acting Chairman of the Department of Engineering came to EDL headquarters in Atlanta, Georgia, to participate in a four-week training program. He also was exposed to the industrial extension service established by EDL in Georgia. It is anticipated that this training will enhance his ability to contribute to the SJU small-scale industry program. Another significant event was the Training and Development Seminar for Small Firms in the Communication Instrument Manufacturing Industry jointly presented by the Korea Communication Industry Cooperative Union and SJU on August 16-20. Forty eight participants—engineers, owners, and managers—attended, representing 24 firms. Indicative of the success of this program is the fact that 80% of the participants stated that this seminar assisted them in solving company problems.

Year III saw publication of three case histories on technical assistance cases handled by SJU staff members. These efforts included diversified assistance to a woodworking machine manufacturing company and a sewing machine company, as well as development of a low-cost tensile strength tester and immersion pyrometer for a group of foundries.

2. University Training and Education. Late in 1974 and as a result of the Year I program, the appropriate national authorities allowed SJU to establish the Department of Industrial Engineering. During Year III, Dr. David Fyffe, Professor in the School of Industrial and Systems Engineering at GIT, was on site in Korea for a three-week period. During his stay, he assisted
in a review of the SJU Department of Industrial Engineering and in identifying
gaps in the available industrial engineering texts and reference books in use;
subsequently, a number of books were donated by GIT staff and shipped to SJU.

3. Industrial Extension and Research Activities. According to the
records maintained by the SJU staff during Year III, 10 different small-scale
industries were provided with technical assistance in the Seoul area and
another 23 companies in the Taejon area. A survey of 17 companies (seven in
Seoul and 10 in Taejon) which had received technical assistance during the year
indicated that their employment had increased from 651 persons at the start of
the year to 810 persons by the end of the year, or a gain of 159 jobs in those
industries. Tables 5 and 6 present the results of this survey, as reported by
each of the two campuses.

4. Appropriate Technology. The subject of appropriate technology has
been emphasized since the start of the program. During Year III the project
staff developed, manufactured, and field tested five devices which are consid­
ered by the staff to be appropriate technology for the Korean small-scale
industry sector. These devices are:

- Flat-plate solar collector
- Multi-tapping machine
- Drilling fixture
- Filter press
- Bicycle brake tester

The flat-plate solar collector is shown in Figure 1 and 2 as an example
of the type of devices being designed and made by the project staff. In
addition, a number of software items of appropriate technology were also devel­
oped, applied, or suggested during the year; they include:

- An improved plant layout and a system for process control and
  production planning for use in a machinery plant
- A cost accounting system for a metal products producer
- A quality control chart system for a machinery plant
- A method for controlling the tensile strength in textile produc­
tion
- Time standards for machining and assembly operations in a metal
  products plant
- The use of an organic solvent to remove fluorescent substances
  from waste paper, enabling conversion to wrapping paper for use
  in export shipments
### Table 5

**SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES ASSISTED BY SOONG JUN UNIVERSITY, SEOUL, 1976**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>21</td>
<td>+ 7</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>29</td>
<td>+15</td>
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<tr>
<td>3</td>
<td>142</td>
<td>155</td>
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<tr>
<td>4</td>
<td>36</td>
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<td>5</td>
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<td>+22</td>
</tr>
<tr>
<td>7</td>
<td>39</td>
<td>98</td>
<td>+59</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>327</strong></td>
<td><strong>460</strong></td>
<td><strong>+133</strong></td>
</tr>
</tbody>
</table>

Source: Soong Jun University, *Survey Data, Fourth Quarter, 1976.*

### Table 6

**SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES ASSISTED BY SOONG JUN UNIVERSITY, TAEJON, 1976**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>38</td>
<td>14</td>
<td>-24</td>
</tr>
<tr>
<td>B</td>
<td>32</td>
<td>23</td>
<td>- 9</td>
</tr>
<tr>
<td>C</td>
<td>77</td>
<td>95</td>
<td>+18</td>
</tr>
<tr>
<td>D</td>
<td>56</td>
<td>60</td>
<td>+ 4</td>
</tr>
<tr>
<td>E</td>
<td>25</td>
<td>26</td>
<td>+ 1</td>
</tr>
<tr>
<td>F</td>
<td>13</td>
<td>18</td>
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<tr>
<td>G</td>
<td>3</td>
<td>5</td>
<td>+ 2</td>
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<td>H</td>
<td>5</td>
<td>12</td>
<td>+ 7</td>
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<tr>
<td>I</td>
<td>45</td>
<td>66</td>
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<td>J</td>
<td>30</td>
<td>31</td>
<td>+1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>324</strong></td>
<td><strong>350</strong></td>
<td><strong>+26</strong></td>
</tr>
</tbody>
</table>

Source: Soong Jun University, *Survey Data, Fourth Quarter, 1976.*
Figure 1
Flat-Plate Solar Collector, SJU

Figure 2
Solar Collector Installation, SJU
o A method for using acid clay to decolorize rice bran oil
o A way of utilizing sodium hydroxide and sodium carbonate to reduce the acidity of rice bran oil

5. Small-Scale Industry Information Center (SSIIC). This unit was established in 1974, Year I, during which time the EDL on-site staff assisted in establishing guidelines for the classification of the collection and determining the future acquisitional needs. Unfortunately, during Year II, the SSIIC did not meet the original expectations, because the person on the SJU staff responsible for the SSIIC left the SJU campus and the Center was not active during that year.

During Year III, the SSIIC was relocated to the Department of Industrial Engineering, where it became part of the Engineering Library and ceased to be a separate unit. The Chief Librarian at SJU was given the responsibility for maintaining the collection; he traveled to the East-West Center for five weeks of training in the collection, documentation, and dissemination of materials related to small-scale industry and the SJU/GIT joint program before becoming the Data Manager for the SSIIC.

6. Audiovisual Documentation. The audiovisual documentation for Year III was continued by the staff member of the East-West Center, Hawaii, during the month of September 1976. This year's audiovisual documentation covers some of the old technical assistance cases and some selected new cases. Copies of the tapes have been made available to the sponsor.

7. Other Activities. Although it is not possible in every case to verify that any particular program at SJU has caused the school to be invited to participate in other programs or activities, the following can reasonably be cited as possible spin-offs:

a. The Korean Ministry of Education gave the Integrated Development Center a $2,000 grant for the conduct of basic research on community development through technical innovation.

b. The Korean National Federation of Small Industry Cooperatives paid $4,000 toward Dr. Ouh's travel costs and registration fees for the U.S. Small Business Administration's International Symposium on Small-Scale Industry, held in Washington, D.C., on November 15-18, 1976.

c. The Asian Foundation provided a $7,500 grant for the continuation of the development of an improved version of the "chegae."
d. The Southern Presbyterian Church and the United Presbyterian Church gave $50,000 for a 1-1/2-year rural development project to be directed by the Regional Development Institute on the Taejon campus.

e. SJU received $6,000 during 1976 from the Industry-University Cooperative Foundation for its part in a five-year small-industry development program which involves three neighborhood universities. SJU has been designated as the lead institution for this project.

f. Two SJU faculty members were asked to be technical consultants to the Korean National Federation of Small Industry Cooperatives.

g. Dr. Ouh was invited by the Technology and Development Institute of the East-West Center to participate in a week-long RATC Program Evaluation Workshop.

h. The Konrad Adenauer Foundation has expressed interest in funding SJU faculty and student training and education in Germany to expedite the present small-scale industry program.

i. The Industrial Development Research Centre funded Dr. Ouh's attendance at a Pre-Research Meeting on a Regional Comparative Study on Small-Scale Industrial Entrepreneurship which was held in Hyderabad, India. The meeting was conducted by the Association of Development Research and Training Institutes of Asia and the Pacific (ADIPA), of which the SJU Integrated Center is a member.

Figure 3, on the following page, is the Project Plan for the activities scheduled for Year III.

**Fundação Educacional do Sul de Santa Catarina (FESSC)**

The Year III report for this project (B-427) presents at length the many accomplishments of the dedicated and well-motivated staff of FESSC. The most notable achievements are summarized below.

1. **Basic Data Center (CDB).** As a result of the March 1974 flood (Year I), the CDB was practically destroyed and the main objective was to rebuild the collection as quickly as possible. During Year II, over 600 documents were received, classified, cataloged, coded, and entered into the CDB collection. This input practically doubled the collection. In Year III, the additions to the collection totaled 2,946 documents. Table 7 presents a summary of the
**Project Title:** Small-Scale Industry Program, SJU

**Project Director:** N. C. Wall

<table>
<thead>
<tr>
<th>Activity</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
<tr>
<td>Preparation of Final Report Year II</td>
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<td>EDL Staff on Site</td>
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<tr>
<td>Industrial Training and Education</td>
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<td>Audiovisual Filming on Site</td>
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### Table 7
**PUBLICATIONS ADDED TO THE CDB COLLECTION**
**1975-1977**

<table>
<thead>
<tr>
<th>Type of Publication</th>
<th>1975-76</th>
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<td>Periodicals</td>
<td>477</td>
<td>863</td>
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<tr>
<td>Annuals</td>
<td>9</td>
<td>10</td>
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<td>81</td>
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<tr>
<td>Books</td>
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<td>107</td>
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<tr>
<td>Manuals</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Maps</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Reports</td>
<td>15</td>
<td>22</td>
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<tr>
<td>Profiles</td>
<td>1</td>
<td>74</td>
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<tr>
<td>Monographs</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Newspapers</td>
<td>5</td>
<td>12</td>
</tr>
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<td>Calendar</td>
<td>-</td>
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<tr>
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<td>88</td>
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<tr>
<td>Booklets</td>
<td>-</td>
<td>88</td>
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<tr>
<td>Pamphlets</td>
<td>-</td>
<td>53</td>
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<tr>
<td>Newspaper Clippings</td>
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<td>1,475</td>
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<tr>
<td>Census</td>
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<td>3</td>
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<tr>
<td>Others</td>
<td>-</td>
<td>48</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>606</td>
<td>2,946</td>
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</table>
documents added to the CDB collection in both Year II and Year III of the program. The usage of the collection also increased; in Year II only 60 data requests were made to the CDB staff, while in Year III the requests for information totaled 106. As routine procedure, the CDB also provides all the information and data backup requested by the project staff in developing reports, industrial cases, guidelines, or technical assistance cases.

A section of the collection housed at the CDB is shown in Figure 4 of this report.

![Figure 4](image)

**Figure 4**
Section of the Basic Data Center at FESSC

2. **Center for Management and Technical Assistance (CETEG).** This center has been very successful and a great contributor to the program's achievements since the start of Year I. The staff has been actively providing management and technical assistance to the small-scale industries located in the two micro-regions of AMUREL and AMSESC, a geographic area that covers 9,500 square kilometers and encompasses 32 municipalities. During Year I, the FESSC staff recorded servicing 45 industries plus innumerable others attended following the flood disaster; in Year II, the CETEG staff were able to service 37 industries, and in the past year, they attended 80 requests for technical and management assistance. Of these 80 cases, 45 were considered technical or management assistance cases and the balance were inquiries, consultations, and limited assistance requests.
The companies being served are typical of the small-scale industry sector in Brazil. In most cases, the owner-operator has very limited technical or management background. Figures 5 and 6 represent two such industries.

Figure 5
Owner-Operator of Small-Scale Industry in Brazil

Figure 6
Small-Scale Bottling Plant, Tubarão, Brazil
Employment generation in this rural area continues to be a high priority in the CETEG program. Table 8 summarizes the variations in employment and sales for 15 companies that received management or technical assistance under the FESSC program and were surveyed at the end of the program year, as well as two new companies which were established during the year.

During the 12-month period, the staff also researched and published one feasibility study, three prefeasibility studies, 24 new manufacturing opportunity studies or identifications of manufacturing opportunities, and two management guidelines; initiated one industrial case study; and assisted, conducted, or sponsored 13 conferences, seminars, and lectures.

3. Adaptive Technology Center (CATT). The CATT was established in Year I to serve as the nucleus around which FESSC could start developing engineering or technical disciplines and, eventually, an engineering department and degree programs in engineering by 1979 or 1980. After a very slow start, CATT has grown slowly in the past two years. In Year III, CATT added a chemical engineer and an industrial engineer to its staff. The unit staff is at present reviewing "foreign" technologies and attempting to adapt them to local small-scale industry applications.

As part of their Year III activities, the CATT staff researched and developed a design project for a kiln required by one of the local companies as well as a production study in the field of jellies, jams, and candies. Negotiations are under way by the EDL staff to have the International Rice Research Institute (IRRI) use the CATT facilities in Brazil to serve some of the IRRI projects.

4. Industrial Training and Education. The Center for Permanent Education (CEP) evolved during the year to the Department of Permanent Education (DEP) but continued to have the responsibility of coordinating with FESSC and other units all the training activities under this program. In Year III, the DEP offered 19 industrial training programs which were completed by 359 persons. In addition, 14 lectures, conferences, and workshops were presented to government officials, local manufacturers, and FESSC staff members. Over 30 members of the FESSC staff received special training in some 18 different training programs sponsored by CEP and offered by FESSC or other participating institutions.
Table 8
VARIATION IN EMPLOYMENT AND VOLUME OF SALES
COMPANIES RECEIVING TECHNICAL ASSISTANCE, 1976

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Employment 1976 Variation</th>
<th>Sales (Cr$000) 1976 Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start</td>
<td>End</td>
</tr>
<tr>
<td>Cerâmica Fatima Ltda.</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Zomer Ind. Plásticos Ltda.</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>Irmaos Fernandes</td>
<td>70</td>
<td>96</td>
</tr>
<tr>
<td>Metalurgica Souza Ltda.</td>
<td>36</td>
<td>27</td>
</tr>
<tr>
<td>Nicodemos Philippi Cia.</td>
<td>17</td>
<td>80</td>
</tr>
<tr>
<td>ALUSUD-Aluminios do Sul S.A.</td>
<td>48</td>
<td>300</td>
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<td>ELINCA-Electro Ind.</td>
<td>8</td>
<td>14</td>
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<tr>
<td>Catarinense Ltda.</td>
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<td></td>
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<tr>
<td>Luiz Pedro Medeiros and Filhos Ltda.</td>
<td>26</td>
<td>28</td>
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<tr>
<td>Nivaldo Cunha de Oliveira</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>INEL-Industria Extrativa Ltda.</td>
<td>102</td>
<td>122</td>
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<tr>
<td>Farmoterapica do Vale Ltda.</td>
<td>28</td>
<td>95</td>
</tr>
<tr>
<td>Tubarao Com. e Ind. Quimica Ltda.</td>
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<td>23</td>
</tr>
<tr>
<td>O. J. Kliemann and Filhos</td>
<td>86</td>
<td>98</td>
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<td>INBRAL-Ind. Bras. de Laminados</td>
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<td>INCOCESA-Ind. Com. Ceramica S.A.</td>
<td>416</td>
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<td>Galvanosul Ltda.</td>
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<tr>
<td>Refraza S. A.</td>
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<td>60</td>
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<tr>
<td>Total</td>
<td>915</td>
<td>1,991</td>
</tr>
</tbody>
</table>
5. Audiovisual Documentation. One of the accomplishments of the Year II program was the establishment of an audiovisual section at FESSC. In Year III this unit, together with the EDL staff assigned to audiovisual documentation, taped the industrial cases for the year. Part of the equipment purchased is shown in Figure 7 of this report. Copies of the tapes and still photos have been made available to the sponsor and will be made available to other interested persons upon request.

![Figure 7](image)

Audiovisual Equipment at FESSC

Figure 8 on the following page is the Project Plan for Year III of this program.

University of Ife (UI)

At the end of the first year of implementation of this project, the Industrial Research and Development Unit (IRDU) of the UI had attained the goals originally established by the program.

1. Extension Service. The main scope of work planned for Year I was the establishment of a solid organizational foundation through which pragmatic and effective industrial extension services could be provided to small-scale industries in Oyo and Ondo states. Early in the year, the IRDU staff, in cooperation with EDL staff on site, prepared Industrial Extension Operation Guidelines for the future field stations. Following that, the first field station was
established at 26 Obalufon Street in Ile-Ife and five persons were assigned to this office. Later in the year, the second field station was established at 226 Ikere Road in Ado-Ekiti and staffed with four persons.

The officer in charge of each station received on-site training provided by the EDL staff in Nigeria at the time. The balance of the field station staff was trained by the IRDU senior staff. During the first year, the Ile-Ife field station was able to render management and technical assistance to 25 small-scale industries and the Ado-Ekiti field station served 28. Figure 9 presents a small-scale roadside automotive mechanic shop and Figure 10 a small-scale textile operation.

Figure 9
Roadside Mechanic in Nigeria

Figure 10
Textile Manufacturer Served by IRDU
2. **Baseline Study.** The IRDU staff, assisted by the EDL staff on site, prepared a baseline study of Nigeria and the project area as the first field activity sponsored by the program. The published study has been presented to the sponsor.

3. **Management Development Division.** This division of IRDU was responsible for implementing the industrial extension portion of the program and the establishment of the field stations. As the project expanded, it became apparent that the division had to be reorganized to cope with the existing needs. The division was expanded and evolved into the present Management and Extension Division. The service being provided at present is the first of its kind to be offered to the small-scale industry sector in Nigeria. A brochure describing the available services was published and circulated to local small-scale industries.

4. **Industrial Training and Education.** During the year, the IRDU staff presented four workshops to government officials and to the general public. Their records indicate that participants included 73 government officials, mostly from the Ministry of Industry, and 50 small-scale industrialists. One of the four workshops was held only for IRDU staff as part of their training.

   An exhibition of products made by small-scale industries in Nigeria was organized and held by IRDU. This exhibition was open to the general public from August 25 to August 27, 1975, at the Kwara Polytechnic in the city of Ilorin.

   Two senior staff members of IRDU attended the seminar presented by the Centre for Management Development (CMD) at Benin City during the month of September 1975. One other senior staff member represented IRDU at the Mini-Conference on Adaptive Technology and Small Industry Development presented by the Georgia Institute of Technology and the University of the Philippines, Institute for Small-Scale Industries in Manila, Philippines, May 26-29, 1976.

5. **Technical Assistance.** The two field stations established during Year I provided on-site technical assistance to 53 small-scale industries within the project area, as was indicated at the start of this section. Of these, 33 cases are being monitored (17 from Ile-Ife and 16 from Ado-Ekiti) for employment generation. At the end of Year I, these 33 companies employed a total of 391 persons. The increase or decrease in employment of these companies will be reported at the end of Year II of the B-455 project.
6. Published Studies. A total of 21 documents were published by the IRDU staff during the first year of their project. Of these 21 studies, four were feasibility studies, one was a national study commissioned by the government, and the other 16 had to do with organization, policy, entrepreneurship, finance, and training.

Figure 11, on the following page, is the Project Plan for Year I at UI.

University of the Philippines, Institute for Small-Scale Industry (UP/ISSI)

As soon as the Year I grant was established, the UP/ISSI staff started implementing the approved program of work. Their first year of activity has allowed UP/ISSI to achieve their primary goals.

1. Extension Service. The project plan called for the initiation of this service during the first year of activity. Early in the year the first extension office was established at Tacloban City, Leyte, in Region VIII. A picture of the Tacloban office and some members of the staff appears as Figure 12.

The staff of seven persons had been trained by the senior members of the UP/ISSI staff and were able to initiate operations at once. The Tacloban City office initiated 14 technical assistance cases during the year, of which two were in the public sector and the remaining 12 were in the private sector. Of the 14 cases, one was terminated during the first year and the other 13 are being carried over into Year II. In addition, the staff contacted 18 other small-scale industries, but they reported no need for technical assistance at this time.

No appreciable increase in employment was reported during Year I, but it is anticipated that the project will be able to generate more employment since many of the cases being serviced at present call for plant expansion and increased utilization of existing facilities. The 14 companies that were served during the year reported a total increase of seven jobs.

2. Information and Research. The UP/ISSI staff generated the necessary data to allow for the preparation of the baseline study of the region. This study was published by the Georgia Institute of Technology, and copies have been made available to the sponsor. UP/ISSI staff members also conducted other research studies and responded to 15 data inquiries ranging from project conceptualization guidelines to sources of financing.
# Project Title
S.I.G. University of Ife - Year I

## Project Director
N. C. Wall

### Project Plan

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<th>Date</th>
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<tbody>
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<tr>
<td>July</td>
<td>Project Organization and Planning</td>
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<td>Aug.</td>
<td>Establish Field Station - Ife</td>
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<tr>
<td>Sept.</td>
<td>Establish Field Station - Ado-Ekiti</td>
</tr>
<tr>
<td>Oct.</td>
<td>Operation of Field Stations</td>
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<tr>
<td>Nov.</td>
<td>Start Baseline Study</td>
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<tr>
<td>Dec.</td>
<td>Industrial Extension Service</td>
</tr>
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<td>Jan.</td>
<td>Training Staff at IDD</td>
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<td>Feb.</td>
<td>On-Site Assistance - N. C. Wall</td>
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<td>Aug.</td>
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<td>Sept.</td>
<td>Seminar - Federal Ministry of Industries</td>
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<td>Oct.</td>
<td>Mobile Indoctrination Program</td>
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### Quarterly Report

- July
- August
- September
- October
- November
- December

### Annual Reports

- January
- February
- March
- April
- May
- June
3. **Staff Development and Training.** A four-week training program was designed and presented at EDL headquarters in Atlanta, Georgia, for the person who was to become the officer in-charge of the Tacloban City office. Another staff member of UP/ISSI participated in a four-week program of training at the East-West Center, Hawaii, for directors of Asian RATC/SID centers which dealt with the evaluation of the activities of these centers. Both the Counterpart Project Director and the Coordinator separately visited EDL headquarters in Atlanta, Georgia, during the year to confer and coordinate actions that were planned for the year.

4. **Appropriate Technology Activity.** A mechanical feed mixer was designed and fabricated out of a 210-liter gasoline drum. This equipment, operated manually, was made to serve a local swine raiser. The entrepreneur can now mix efficiently his feed, which consists of soybeans, greens, rice bran, and other ingredients. Full design details are available from EDL or from UP/ISSI. Figure 13 shows the finished feed mixer designed by the UP/ISSI staff.

5. **Linkages with Other Organizations.** Recognizing the need to coordinate the extension office activities with national and local organizations with common interest in the region, the following linkages were developed.

- National Economic Development Authority (NEDA)
- Sab-A Basin Development Activity
- Small Business Advisory Center (SBAC)
- National Cottage Industry and Development Authority (NACIDA)
6. Audiovisual Documentation. Under a separate contract with the East-West Center, Hawaii, an audiovisual document of the activities of the extension office was prepared. Copies of this tape and of still photographs have been made available to the sponsor and can be made available upon request to other interested persons.

Figure 14, on the following page, is the Project Plan for Year I at UP/ISSI.

Economic Development Laboratory

As specified by the grant document, each of the four counterpart institutions invested one half of its grant funds in contracting with the Economic Development Laboratory to provide the necessary training and consulting assistance to the individual projects. Two of them also contracted with the East-West Center, Hawaii, to assist in taping the audiovisual documentation of the program.
Project Title: SIG UP/ISSI
Project Director: N. C. Wall

Baseline Study - Design & Production (GIT)
Training Program Dev. Incl.Cd. Candidate Selection (Atlanta - GIT)
Reporting Format Development (GIT-ISSI)
Extension Office to Be Operational
Training Program Execution (Atlanta - GIT)
Training Program Execution (UP/ISSI)
Quarterly Report Submission to GIT
Annual Report Submission to GIT
Technical Assist. Field Sup. to UP/ISSI - Tacloban (GIT)
Data Retrieval Support to UP/ISSI by the EDL Int'l. Development Data Center
Lecture/Seminar for UP/ISSI Staff (GIT)
Audiovisual Survey -- Case Histories (Sep. Contract with the East-West Center)
Review of UP/ISSI Planning Proposal -- Year II Activity (GIT-ISSI)
Many members of the EDL staff were on site during the year to provide the contractual support to the individual projects. A brief listing of the individual EDL staff members follows. Most of these visits were funded by one of the corresponding projects (B-426, B-427, B-455, or B-463); yet others, marked with an asterisk, were on site under an AID 211(d) grant to the Georgia Institute of Technology.

Soong Jun University (1976)

February 11-March 12
May 24-June 12
June 1-June 9
June 1-June 9
June 1-June 9
August 23-September 11
October 31-November 7

R. A. Manoff
E. D. Lewis
R. W. Hammond*
Howard Dean*
Donald E. Lodge*
David E. Fyffe
Donald E. Lodge

Fundação Educacional do Sul de Santa Catarina, Brazil (1976)

April 17-May 14
August 7-August 23
August 7-August 13
November 27-December 10

Nelson C. Wall
Nelson C. Wall
Edwina Udunka
Harlan Davis

University of Ife (1975-1976)

September 23-October 11
September 27-October 14
November 29-December 6
November 29-December 6
March 23-April 17

Nelson C. Wall
Sherman Dudley
Martha Ann Stegar*
Frank Kingsland
Nelson C. Wall

University of the Philippines, Institute for Small-Scale Industries (1976)

March 12-April 2
May 23-May 30
May 23-May 30
May 23-May 30
May 23-May 30
September 13-September 29
November 7-November 20

R. A. Manoff
Ross W. Hammond*
Howard Dean*
Donald E. Lodge*
Kenneth Stephens*
Philip Hess*
Sherman Dudley
Donald E. Lodge
January 9, 1977, marked the completion of the third year of implementation of Project A-1600. Of the four counterpart institutions participating in this program, two had completed three years of activity (Soong Jun University, B-426; and Fundação Educacional do Sul de Santa Catarina, B-427), one had completed 18 months of implementation (University of Ife, B-455), and the fourth had ended its first year (University of the Philippines, Institute for Small-Scale Industries, B-463).

Individual activities and achievements of each of the four counterparts have been recapitulated above under the title of General Activities During Program Year III, as well as in the individual end-of-the-year report for each of the four projects. At this time, a review will be made of accomplishments, changes, and other indicators that point out the overall effect of this program in the respective project areas of the two counterparts that have completed three program years.

Soong Jun University

The staff at SJU, working out of two campuses, have been active in the geographic areas around Seoul and Taejon, which include Young Dung Po, Kwanak, Yun Kee Kun, Tae Duck Kun, and Taejon. Details of population and land areas appear in the corresponding Base Line Data published by GIT in 1975.

One important goal pursued by the SJU staff has been development of appropriate technology. In the past three years, the SJU staff has developed, built, and field-tested nine appropriate technology devices. These devices are:

- Low-cost tensile strength tester
- Sizing or shaving die for truing up metal rod cross sections
- Low-cost immersion pyrometer
- Wheeled version of the "chegae," the traditional backpack
- Flat-plate solar collector
- Multi-tapping machine
- Drilling fixture
- Filter press
- Bicycle brake testing device
The last five were developed this year and have been mentioned in this report. The original low-cost tensile strength tester appears as Figure 15 of this report and the modified version is shown in Figure 16.

![Figure 15](image1.jpg)

**Figure 15**

Original Low-Cost Tensile Strength Tester, SJU

![Figure 16](image2.jpg)

**Figure 16**

Modified Tensile Strength Tester, SJU

Since the project began, the SJU staff has been monitoring the employment variance in some of the industries they have been providing technical assistance to. Table 9 presents the variance reported by the SJU staff in the monitored industries.

The SJU staff provided technical assistance to 18 companies in Year I, 28 industries in Year II, and 33 industries in Year III. This means that
Table 9
VARIANCE IN EMPLOYMENT
COMPANIES RECEIVING ASSISTANCE FROM SJU
1974-1976

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Companies</th>
<th>Start</th>
<th>End</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>19</td>
<td>-</td>
<td>868</td>
<td>-</td>
</tr>
<tr>
<td>1975</td>
<td>19</td>
<td>868</td>
<td>1,444</td>
<td>+576</td>
</tr>
<tr>
<td>1976</td>
<td>18</td>
<td>1,371</td>
<td>1,188</td>
<td>-183</td>
</tr>
</tbody>
</table>

Note: The loss in 1976 was due mainly to one company that shifted from a labor-intensive leather goods line to a specialized PVC line.

In the past three years a total of 79 small-scale industries have received this service.

A Department of Industrial Engineering has been established and is presently in operation as a result of this program. There is no way to quantify the impact or benefits this single result may produce, but the staff considers it to be highly important.

In an attempt to strengthen the bonds between SJU and the companies being served under this program, SJU created an industry-university cooperative committee. This committee has been operating for three years and has awarded certificates of membership to many of the companies. To a certain degree, this certificate is recognized as an award for achievement by the small-scale industrialist.

Fundação Educacional do Sul de Santa Catarina

The FESSC staff is responsible for a geographic area of about 9,500 square kilometers, encompassing a total of 32 municipalities which, in turn, form two micro-regions called AMUREL and AMSESC. The 1970 Census of Population reported 233,266 persons living in AMUREL and 263,519 inhabitants in AMSESC, or a total for the two mini-regions of 496,795 inhabitants; at the time, this represented 17.12% of the total population of the state of Santa Catarina.1/

1/ Nelson C. Wall, Small-Scale Industry Development in South Santa Catarina, Brazil, Case History, Economic Development Laboratory, Georgia Institute of Technology, Atlanta, Georgia, February 1976, p. 36.
Before the program was initiated in 1974, both mini-regions were showing signs of growth, but the industrial and commercial sectors were the weakest of the economic factors. Since 1970, the FESSC staff has been keeping records on the taxes on circulation of merchandise (imposto sobre circulação de mercadorias-ICM) and the industrial production taxes (imposto produção industrial-IPI), and these are presented in Tables 10 and 11 of this section. It is apparent from these tables that both mini-regions have experienced a healthy growth in their revenues from both of these taxes. The program does not claim credit for this increase, but it has assisted this growth through its management and technical assistance services to local enterprises.

For the past three years, the project has been monitoring the variance in employment and sales of some of the companies receiving management and technical assistance from the FESSC staff. Table 12 presents this information. The companies that have been monitored have shown healthy increases in both new jobs and total sales volume.

FESSC staff members not only have provided management and technical assistance to local small-scale industries, but also have prepared studies, reports, and other publications useful to the industrial community. Table 13 summarizes these activities.

In the industrial training field, FESSC presented 112 programs to 2,552 participants during Year I. The following year, 31 programs were offered to 512 participants, and in Year III an additional 19 programs were presented to 359 persons. Over the three years, there have been 162 industrial training programs offered to a participating population of 3,423 persons.
Table 10
REVENUE FROM IPI TAXES, 1970-1976

<table>
<thead>
<tr>
<th>Year</th>
<th>AMUREL Cr$</th>
<th>AMUREL Index</th>
<th>AMSESC Cr$</th>
<th>AMSESC Index</th>
<th>Total Cr$</th>
<th>Total Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1,157,255</td>
<td>1.000</td>
<td>2,622,862</td>
<td>1.000</td>
<td>3,780,117</td>
<td>1.000</td>
</tr>
<tr>
<td>1971</td>
<td>1,661,000</td>
<td>1.435</td>
<td>4,809,000</td>
<td>1.833</td>
<td>6,470,000</td>
<td>1.712</td>
</tr>
<tr>
<td>1972</td>
<td>2,436,812</td>
<td>1.467</td>
<td>7,540,830</td>
<td>1.567</td>
<td>9,977,642</td>
<td>1.542</td>
</tr>
<tr>
<td>1973</td>
<td>3,072,375</td>
<td>1.261</td>
<td>11,929,977</td>
<td>1.582</td>
<td>15,002,352</td>
<td>1.504</td>
</tr>
<tr>
<td>1974</td>
<td>5,753,686</td>
<td>1.873</td>
<td>18,899,746</td>
<td>1.584</td>
<td>24,653,432</td>
<td>1.643</td>
</tr>
<tr>
<td>1976</td>
<td>22,376,884</td>
<td>1.682</td>
<td>47,990,116</td>
<td>1.691</td>
<td>70,367,000</td>
<td>1.688</td>
</tr>
</tbody>
</table>

Source: FESSC records.
Table 11
REVENUE FROM ICM TAXES, 1970-1976

<table>
<thead>
<tr>
<th>Year</th>
<th>AMUREL Cr$</th>
<th>Index</th>
<th>AMSESC Cr$</th>
<th>Index</th>
<th>Total Cr$</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>11,216,052</td>
<td>1.000</td>
<td>11,191,537</td>
<td>1.000</td>
<td>22,407,589</td>
<td>1.000</td>
</tr>
<tr>
<td>1971</td>
<td>14,713,389</td>
<td>1.312</td>
<td>16,700,799</td>
<td>1.492</td>
<td>31,414,188</td>
<td>1.402</td>
</tr>
<tr>
<td>1972</td>
<td>10,970,972</td>
<td>1.085</td>
<td>22,439,738</td>
<td>1.344</td>
<td>33,410,710</td>
<td>1.223</td>
</tr>
<tr>
<td>1974</td>
<td>31,987,934</td>
<td>1.468</td>
<td>46,410,701</td>
<td>1.440</td>
<td>78,398,635</td>
<td>1.452</td>
</tr>
<tr>
<td>1975</td>
<td>52,872,848</td>
<td>1.653</td>
<td>76,102,514</td>
<td>1.640</td>
<td>128,975,362</td>
<td>1.645</td>
</tr>
<tr>
<td>1976</td>
<td>89,510,163</td>
<td>1.698</td>
<td>112,364,837</td>
<td>1.476</td>
<td>201,875,000</td>
<td>1.565</td>
</tr>
</tbody>
</table>

Source: FESSC records.
Table 12
VARIATION IN EMPLOYMENT AND VOLUME OF SALES
COMPANIES RECEIVING ASSISTANCE FROM FESSC
1974-1976

<table>
<thead>
<tr>
<th>Year</th>
<th>Companies</th>
<th>Employment Start</th>
<th>Employment Finish</th>
<th>Employment Variance</th>
<th>Sales (Cr$000) Start</th>
<th>Sales (Cr$000) Finish</th>
<th>Sales Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>8</td>
<td>-</td>
<td>109</td>
<td>-</td>
<td>-</td>
<td>3,656</td>
<td>-</td>
</tr>
<tr>
<td>1975</td>
<td>8</td>
<td>109</td>
<td>140</td>
<td>+31</td>
<td>3,656</td>
<td>7,780</td>
<td>4,124</td>
</tr>
<tr>
<td>1976</td>
<td>17</td>
<td>915</td>
<td>1,991</td>
<td>+1,076</td>
<td>36,123</td>
<td>113,267</td>
<td>+77,144</td>
</tr>
</tbody>
</table>

Table 13
INDUSTRY-ORIENTED ACTIVITIES
FESSC, 1974-1976

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>1974</th>
<th>1975</th>
<th>1976</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Assistance-Continuous</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>Technical Assistance-Discontinuous</td>
<td>14</td>
<td>25</td>
<td>33</td>
<td>72</td>
</tr>
<tr>
<td>Feasibility Studies</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Manufacturing Opportunity Studies</td>
<td>15</td>
<td>14</td>
<td>24</td>
<td>53</td>
</tr>
<tr>
<td>Case Studies</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Other Publications</td>
<td>-</td>
<td>10</td>
<td>6</td>
<td>16</td>
</tr>
</tbody>
</table>
RESULTS AND CONCLUSIONS

The preceding sections have identified many of the accomplishments that have resulted from this third year of the program of work implemented by Project A-1600 and the four counterparts. This final section will briefly summarize the Year III achievements and present the corresponding conclusions.

Results of the Soong Jun University Program (B-426)

1. The professional staff at SJU conducted an in-depth survey of 17 small-scale industries that are presently in this program. These companies have been recipients of the technical assistance service during 1976. In summary, the SJU survey reports that 159 new jobs have been created, for a 24% increase in employment.

2. The joint SJU-GIT team was able to provide technical assistance to a total of 33 small-scale industries, of which 10 were in Seoul and 23 in the Taejon area.

3. Three case histories in technical assistance were prepared, covering assistance provided to a woodworking machinery manufacturer, a sewing machine manufacturer, and to a group of foundries.

4. A member of the GIT team developed a Methodology for Case Study and Case History Preparation.

5. An additional five pieces of appropriate hardware have been designed, built and tested:
   - a flat-plate solar collector
   - a multi-tapping machine
   - a drilling fixture
   - a filter press
   - a testing device for bicycle brakes

6. Eight software items of appropriate technology have been developed, applied, or suggested by the joint SJU/GIT team.

7. A very successful training and development seminar was held, attended by 48 persons from small-scale industries that manufacture communication instruments.
8. The Small-Scale Industry Information Center was incorporated into the SJU Engineering Library and reactivated with the appointment of a Data Manager.

9. The Data Manager of the SSIIC attended a five-week training course at the East-West Center, covering the development, maintenance, and operation of a small-scale industry data collection.

10. Another member of the SJU team participated in a four-week training program conducted by GIT in Georgia. This staff member was able to observe several of the GIT industrial extension offices and to visit firms which have received assistance from these offices.

11. SJU formed a linkage with the Korea Communication Instrument Manufacturers Association and plans to work closely with that group on matters affecting small-scale firms in that industry.

12. Audiovisual documentation of Year III was filmed during the year, covering several of the technical assistance cases which are described in the annual report.

Results of the Fundação Educacional do Sul de Santa Catarina Program (B-427)

1. The CETEG staff provided technical-management assistance to 45 industries in 10 different municipalities within the state. At the same time, 35 additional enterprises consulted with the FESSC staff during the year.

2. During the year, the industries being served and surveyed by the FESSC/GIT staff have increased their labor force by 996 new jobs and their sales on the order of 74 million cruzeiros.

3. The FESSC staff completed during the year one feasibility study, three prefeasibility studies, 24 new manufacturing opportunity reports, two management guidelines, and started one industrial case history.

4. As part of the activities for the year, 14 conferences, seminars, and lectures were presented by the project staff.

5. The Basic Data Center added 2,946 documents to its collection and supplied direct answers to 106 inquiries for information. It also provided all the data support for the preparation of all the studies and reports published during the year.

6. Several special research projects were funded during the year by the federal government, which is a good indicator of the respected position FESSC has been able to gain within Brazil.
7. Training was provided to the FESSC staff and 18 programs were sponsored by the DEP for the staff during 1976-1977.

8. The Adaptive Technology Center prepared the first series of "technical" reports related to local industrial needs.

9. During the year, 19 industrial training programs were sponsored by DEP and over 350 persons completed these training courses.

10. The Center for Permanent Education became sufficiently strong during Year III to be "spun off" as a newly created department of FESSC.

11. The third audiovisual documentation was completed during this year. The FESSC audiovisual group is now doing its own documentation.

12. The EDL staff provided on-site professional consultation to many of the local industries being served by the counterpart staff.

Results of the University of Ife Program (B-455)

1. The first two field stations -- one each at Ile-Ife and Ado-Ekiti -- were adequately equipped and staffed and made operative during the year.

2. The extension service was established, staff was trained, guidelines prepared, and plans made for the establishment of six field stations, including the two which opened in 1975-1976.

3. Through the extension service staff, 53 small-scale industries were given technical assistance during this period. Data have been collected on these industries so that next year the employment generated may be determined, as well as variation (increase or decrease) in sales and other economic indicators.

4. A total of 73 government officials occupying small-industry positions in all the states of the federation were in attendance at training programs offered by IRDU. During the year, about 50 small-scale industrialists participated in an IRDU workshop on "Problems of Small Industries in Nigeria."

5. An exhibition of products manufactured by small-scale industries was successfully organized by IRDU at Ife and Ilorin in August of 1975.

6. The counterpart staff completed and published 16 studies on various aspects of small-scale industry development in Nigeria.
7. The federal government commissioned IRDU to prepare a study on the "Economic Viability of States in Nigeria." As a result of this study, completed in February 1976, additional states have been created in that country.

8. At the start of this program, IRDU had no full-time senior staff members (all were part-time or volunteers). At the end of the first year, IRDU had six full-time senior staff members.

9. During the program year, internal organization changes evolved and, as a result, a new organizational structure emerged by the end of the first year. It is interesting to note that this was accomplished totally by the IRDU staff as they went further into the program year.

10. An audiovisual history of the program was prepared. Due to a necessary schedule change, the actual taping did not take place until the first month of Year II, but covered the first year of activity. This activity was funded under a separate contract.

11. During the grant year, both the IRDU staff and the EDL staff had the unusual opportunity of working together and becoming acquainted with new problems. The knowledge gained of real-world problems and solutions will be of direct value in staff development and feedback to the educational curricula of both institutions.

12. A baseline study of the target areas was completed during the year. The information gathered will serve as a benchmark for project evaluation at the end of the grant.

Results of the University of the Philippines, Institute for Small-Scale Industries Program (B-463)

1. On May 12, 1976, the extension office located on the campus at Tacloban College of the University of the Philippines was opened to the public. This act was made possible by a number of tasks which were completed between February 9, 1976, and the opening day -- the selection of an Officer-in-Charge, the recruitment and training of staff personnel, the arrangement of suitable office space in Tacloban, the outfitting of the office, the preparation of reporting formats, and the distribution of publicity releases.

2. The staff of the extension office visited 30 firms and initiated 14 industrial extension service programs during Year I. Two of these were involved with the public sector and 12 were with the private sector.
3. The staff serviced 15 technical assistance inquiries concerning a variety of subject matter. These differed from the industrial extension service programs in that the nature of the inquiries allowed for the delivery of satisfactory answers with one visit to the client or by referral to a pertinent office or agency covering the subject matter.

4. The staff attended seminars presented in Tacloban by three GIT staff members; the Officer-in-Charge received four weeks of training at GIT; and two staff members each received three weeks of orientation training at the UP/ISSI headquarters on campus.

5. The staff conducted a survey of the training needs of entrepreneurs located in Tacloban for the purpose of planning training programs for these people.

6. Linkages were established with seven governmental agencies and other organizations active in Region VIII development efforts, to insure that various programs may be coordinated and operated to complement each other.

7. The staff conceived, designed, constructed, and delivered a piece of appropriate technology hardware to a client. This was a manually operated feed mixer for use by a swine grower, providing a more thorough mixture of ingredients and permitting the use of local resources instead of a more expensive commercial feed mix.

8. An audiovisual documentation of the year's activities was prepared. Under a separate AID contract, the extension office documented the first-year program through the efforts of the East-West Center. The resulting videotape and photographic collection provided a concise history of the highlights of the program of technical assistance to small-scale industries in Region VIII.

9. The baseline study on Region VIII was completed and published.

10. Consulting services were provided by the EDL staff. In addition to the time utilized in provision of technical assistance to small-scale industries, EDL had time available to provide on-site consultation to the extension office staff in such areas as project development, project administration, operations, and report preparation.

11. During the grant year, both the UP/ISSI staff and the EDL staff had the opportunity of working together in seeking and attempting to solve new
problems. The knowledge gained of real-world problems and solutions will be of direct value in staff development and in feedback to the university education curricula.

Conclusions

Under Project A-1600, EDL has been able to successfully establish four counterpart projects with units in developing countries. These counterparts are fully dedicated to the concept of generating and expanding small-scale industries in their respective areas of influence. The two counterparts that have completed three years are now capable of implementing action-oriented, pragmatic industrial programs, and some fine results are presently visible.

These four counterpart programs have directly or indirectly assisted in the generation of over 1,000 new industrial jobs in rural areas of developing nations. As a secondary result of the program, the counterpart institutions are now capable of carrying out to some degree the necessary research, adaptation, and transferral of appropriate technology and the design and presentation of industrial training and educational programs.

Perhaps the greatest single accomplishment of the program is that small-scale industries in the four project areas are receiving assistance that previously was unavailable to them. This new service is expected to have a beneficial economic impact on the rural poor of these areas.

It is, therefore, the conclusion of the Project Director and the Counterpart Project Directors that results to date are far greater than initially conceived, but these are nowhere near the long-range benefits that can be anticipated. The counterparts are eager to continue this activity and have made appropriate plans for the next program year.
SMALL-SCALE INDUSTRY
GRANT
YEAR IV

STIMULATING THE GROWTH OF SMALL-SCALE INDUSTRY
Grant Period: January 10, 1977 to January 9, 1978

A PROGRAM FUNDED BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
FINAL REPORT
YEAR IV

STIMULATING THE GROWTH OF
SMALL-SCALE INDUSTRY

by
Nelson C. Wall

Project A-1600
Contract No. AID/ta-c-1062

Office of International Programs
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY
Atlanta, Georgia 30332, U.S.A.
February 1978
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INTRODUCTION

On January 23, 1974, the Agency for International Development (AID) funded for the first time Contract No. AID/ta-c-1062, through which the Office of International Programs (OIP) of the Engineering Experiment Station at the Georgia Institute of Technology was assigned the responsibility of implementing a long-range program of work in the area of stimulating growth of small-scale industry by providing assistance grants to counterpart institutions. The administrative portion of this AID contract was assigned internally to the Office of International Programs (OIP) and given the project number A-1600 by the Georgia Institute of Technology.

Second, third, and fourth consecutive years were funded by the same sponsor. This is the final report for Year IV of this project, which continues to be implemented in four different geographical regions of the world. In Year I only two counterparts were funded: Soong Jun University, Seoul, Korea (Project B-426), and the Fundacao Educacional do Sul de Santa Catarina, Tubarao, Brazil (Project B-427). During Year II, the third counterpart institution was funded, the University of Ife, Ile-Ife, Nigeria (Project B-455), and in Year III the fourth counterpart institution, the University of the Philippines, Institute for Small-Scale Industries, Manila, Philippines (Project B-463), was added. In Year IV, the University of Science and Technology, Technology Consultancy Centre, Kumasi, Ghana (Project B-492), replaced the University of Ife, which was dropped from the program.

In selecting each of the above counterpart institutions, the following criteria were followed, as specified by the sponsor and the contract guidelines:

1. Suitability of the national macroeconomic framework for local business conditions.
2. Existence of practicing or potential entrepreneurs.
3. Community concern over unemployment.
4. Existence of potential markets for additional products.
5. Linkages (current or potential) with educational, financial, and business communities.
6. Quality of the staff.
7. The institution's potential for utilizing the grant effectively.
8. Potential multiplier effects.
9. Host government commitments.

In selecting the above-mentioned counterpart institutions, an extensive survey was conducted and approximately 30 potential counterparts in 12 developing countries were reviewed by the OIP staff and the sponsor.

Each of the selected institutions prepared and submitted to OIP its project proposal, and later they were funded by separate $45,000 grants (one year) as provided by the base project, A-1600.

Under the terms of the grant to each of the counterparts, the grantee was permitted to utilize half of the grant funds to support its own personnel, travel, materials and supplies, conferences, etc. The balance of the grant funds were to be used by the grantee to contract for training and consultation services from U.S. technical assistance-type organizations.

The grantees subsequently contracted with OIP, through the Georgia Institute of Technology, to provide training, consultation, information and data, and audiovisual documentation of the established projects.

At the end of each of the three past program years, each individual project has been reported on separately.\(^{1/}\) The sponsor has been provided with an ample number of copies of the yearly reports as well as a complete set of the audiovisual documentaries for the individual counterpart institutions. In the past four years, two in-depth project reviews have been conducted by the sponsor, and each time minor adjustments have been recommended and implemented. The total program will terminate on January 9, 1978, when Year V comes to its programmed end.

\(^{1/}\)For full details, refer to the respective end-of-the-year reports entitled Final Report--Small-Scale Industry Grant for each year and each counterpart named in this document, by Nelson C. Wall, published by the Georgia Institute of Technology, Atlanta, Georgia, January 1975, 1976, 1977, and 1978.
SUMMARY OF PROGRAM YEAR IV

Other sections of this final report present in detail the activities and results attained by each of the counterpart institutions during this past year of the program. This section summarizes and highlights some of the immediate results obtained.

Project B-426--Soong Jun University (SJU), Seoul, Korea

1. A survey of 17 firms receiving technical assistance from SJU during the year show an increase of 120 jobs.
2. Twenty-eight companies were provided with technical assistance during the year--13 in Seoul and 15 in the Taejon area.
3. A firm received funding in the amount of $125,000 from the Asian Development Bank for the construction of a new plant.
4. Audiovisual documentation of the program was continued with coverage of both new and old cases.
5. The prototype "cheegay" received final field testing, and a local manufacturer has agreed to produce on speculation 500 units to be marketed during 1978.
6. SJU established working relationships with several Korean national institutions.
7. Several seminars and training courses were presented for small business managers, students, and government employees.
8. Four publications were prepared and published during the year. The facility at SJU received both national and international recognition for its work with small-scale industries in Korea.

Project B-427--Fundacao Educacional do Sul de Santa Catarina (FESSC), Tubarao, Brazil

1. Technical-management assistance was provided to 34 local small-scale industries in 13 different municipalities. In addition, consultation, information, and limited assistance were provided to another 28 local enterprises during this year.
2. Of the 34 companies receiving technical-management assistance during this year, 23 were surveyed at the start and end of the year; between them, they reported having increased their labor force by 662 persons.

3. The counterpart staff also completed three prefeasibility studies, 13 new manufacturing opportunity studies, three management guidelines, five industrial studies, and two case histories.

4. During the year, five conferences, lectures, or seminars were presented by the counterpart staff.

5. The Basic Data Center increased its holdings by 1,972 publications and 1,931 newspaper clippings. They replied to 526 information requests presented during this time period.

6. The Technology Center was approved by the federal and state governments, and 26 million cruzeiros were made available by the government for the construction and equipping of the proposed 4,000-square meter building.

7. Training of local human resources was continued, with 22 training programs being offered by the FESSC staff and 1,294 persons completing them.

8. The fourth audiovisual documentary was taped during this year.

**Project B-455--University of Ife (UI), Ile-Ife, Nigeria**

During Year IV, the University of Ife (UI) participated only for a period of six months, from January through June 1977, at which time the grant was discontinued. The grantee failed to present the corresponding quarterly report (January-March) and the end-of-the-year report (June) for 1977, and to this date has not submitted said reports. Due to administrative changes at UI during the last half of 1976, it is apparent that UI has other objectives and priorities, and there appears to be very little interest in continuing stimulating the generation of small-scale industries.

The OIP staff consulted several times with the sponsor and discussed this problem, finally recommending that the grant be terminated. The sponsor approved this recommendation, and the grant was not renewed after the conclusion of the grant year ending in June 1977.
This institutional counterpart entered the program in January 1976. This was their second full year of participation, and during this year they obtained the following results:

1. The UP/ISSI staff provided technical-management assistance to 22 firms during the year. A survey was conducted of the firms that were serviced during their Year I (1976-77), and these reported an employment increase of 47 new jobs—a 31% increase over the period during which technical assistance was provided.

2. A five-day workshop was presented on "The Concept and Practice of Entrepreneurial Development"; 23 educational institution staff members completed the program. A seminar on entrepreneurship also was held and 16 persons completed the course work.

3. The pilot field office at Tacloban continued in operation, and one staff member received training at OIP headquarters in Atlanta. Another staff member participated in the industrial extension training course offered at the UP main campus.

4. A survey of small-scale industries in Region VIII was conducted which generated data on present employment and on problems being identified by these firms. During the year, five feasibility studies were completed. Work also was begun on the preparation of training material for a program on "Fermentative Food Processing and Food Preservation" to be offered during Year III.

5. A trade organization of automotive and metalworking shops located in Tacloban was formed during the year. The UP/ISSI extension office in that city was responsible for getting 48 firms to join and form the Tacloban Ironworks and Engineering Industries Association.

6. One hundred and thirty six apprentices completed a "skills" training program for automotive and machine shop workers. This was a joint program presented by the Tacloban Ironworks and Engineering Industries Association and the UP/ISSI staff at Tacloban.

7. The UP/ISSI staff designed and constructed a wood lathe now in use by a local furniture plant. They also designed a cart for handling material
and waste in a wood products plant. Work was begun to adapt an improved band-saw design for future use in the wood plants located in Region VIII.

8. The audiovisual documentation was continued into Year II of the program. The UP/ISSI also entered into an agreement with the Divine Word University for sharing of resources by both institutions.

Project B-492--University of Science and Technology, Technology Consultancy Centre (UST/TCC), Kumasi, Ghana

This project was not initiated until June 1977, so it is only now into six months of implementation. The grantee has initiated some research work in the areas of solar energy, foundries, sugar refineries, and tufted textile machinery, and OIP has been providing the information backup.

At present, OIP has two staff members on site implementing a companion project for the design and fabrication of a pyrolysis unit in Ghana. This appropriate technology design will be field tested this year and will be used as the prime energy source for an existing brick kiln at the TCC campus in Kumasi.
Background

For the past 14 years, the Engineering Experiment Station (EES) at the Georgia Institute of Technology has had within its organization a group of professionals responsible for the overseas activity of EES. This group is now identified as the Office of International Programs (OIP). In 1972, after a series of very successful AID-sponsored projects in less-developed countries (LDCs) conducted by the staff of OIP, the Georgia Institute of Technology was awarded an AID 21l(d) grant.

Through this grant, the OIP staff was able to identify the need for stimulating the growth of small-scale industries in LDCs. In an attempt to respond to this identified need, a proposal was submitted to AID under the title of "Stimulating the Growth of Small-Scale Industry." On January 23, 1974, the proposal was accepted and funded by AID and the administrative portion of the program became Project A-1600 at the Georgia Institute of Technology.

Prior to the funding of this grant, the OIP staff had identified the general problems associated with the expansion and diversification of small-scale industry as well as the creation of new industries. The following general problems had been identified:

1. Lack of a systems analysis approach to providing research, services, and information to industry.
2. Insufficient funding to expand industrial assistance activities.
3. Continuing need for training of more organizational staff personnel.
4. Lack of knowledge of pragmatic methodologies.
5. A deficient information base related to technical and management problems of small-scale industries.

In view of these general problems, the OIP staff recommended that the program to be initiated under the grant funded by AID should attempt to cope with these identified problems. The proposed program contained the following basic elements:

1. An organization focus with clearly defined aims.
2. A well-trained and motivated staff.
3. An information base.
4. A technical assistance "delivery system."
5. A pragmatic approach to the provision of technical/management assistance.

Once this proposed program was funded by AID, Project A-1600 was established and became the administrative project at the same time $45,000 grants were made to each of the selected counterpart institutions. Mr. Nelson C. Wall, Associate Director of OIP, was named as Project Director on A-1600.

As indicated earlier, the terms of the grants to the counterpart institutions permitted the grantee to allocate half of the grant funds for personnel, travel, materials and supplies, conferences, etc. The other half of the grant funds was to be used by the grantee to obtain training and consultation services from qualified organizations in the U.S.A. All four counterpart institutions contracted with OIP for these services.

The counterpart institutions funded for a full year or for one-half year during Year IV of this project are briefly described below.

**Soong Jun University**

Soong Jun University was formed in 1970 when Soong Sil College merged with Taejon College and together formed a new cooperative venture in the field of Christian education. The original Soong Sil College was formed in Pyeng Yong (North Korea) in 1897. In 1938, during the Japanese occupation, the institution was closed and in 1954 it was reopened in Seoul. The Taejon Presbyterian College was founded in 1956 under the sponsorship of the Southern Presbyterian Mission in the city of Taejon.

The principal campus of SJU is located in Seoul near the large industrial complex of Young Dung Po, which has a population of over 1.5 million inhabitants. The second campus is at Taejon, which is a smaller industrial area with a population of about 500,000 persons.

The Integrated Development Center (IDC) at Soong Jun University was assigned the responsibility for all program activities and for the past four years has served as the counterpart unit to OIP at the Georgia Institute of Technology.
Fundacao Educacional do Sul de Santa Catarina

This educational nonprofit foundation is an autonomous entity established by the Civil Code and national legislation under Decree Laws 200 and 900. It was later constituted by Municipal Law No. 443-67 of October 18, 1967. Five years later, the Federal Government of Brazil recognized it as being of "utility" to the government by Decree No. 70,680 of June 7, 1972.

FESSC has the following objectives: (1) develop middle and higher education as required by the labor market, which is to be done by formal and informal coursework; (2) promote education and research related to the development of the state of Santa Catarina; and (3) engage leadership and population in the process of self-promotion to develop the local and regional areas.

The FESSC campus at Tubarao, Santa Catarina, has an area of about 160,000 square meters, and the student enrollment in higher education (at present 18 programs) is well over 3,000 persons, representing 32 municipalities. Also attending classes at FESSC are some 4,000 students in the nine programs of the middle education level as part of the integrated professional-educational system of the city.

FESSC assigned to the Department of Research and Development (DPD) the responsibility for the Small Industry Grant program activities for the past four years. This department has constantly served as the counterpart to the Office of International Programs at Georgia Tech.

University of Ife

The government of the then Western State of Nigeria (now Oyo State) established the University of Ife in October 1961. This institution is financed by both federal and state governments on a 40%-60% basis. The University of Ife was located in the heart of the agricultural area of that state and it started its activities by establishing the Department of Economics and Social Sciences in 1962.

In its research commitments, the administration of UI set up research programs on (1) population and manpower, (2) drugs, (3) customary laws, (4) coal and allied minerals, (5) human resources, (6) Kainji Dam problems, (7) agricultural extension and implementation, and (8) small and medium-scale industries.
The University's student enrollment has grown from some 300 students in 1962 to well over 5,000 by 1976. The huge campus at Ife is about 25 square miles; the land was granted by the then Western State to the University.

The Industrial Research and Development Unit (IRDU) was created within the Department of Economics in 1969. During the 18 months that UI participated in this program, IRDU served as the counterpart unit to OIP.

University of the Philippines

The University of the Philippines created the Institute for Small-Scale Industries (UP/ISSI) in 1966 in order to provide support to small-scale industry and entrepreneurial development in the Philippines.

In behalf of Philippine small-scale industry, the UP/ISSI activities have included management training, in-plant technical assistance support, entrepreneurial development, management and technical data development and dissemination, as well as the continuing and successful advancement of its own professional and executive capabilities.

The University of the Philippines entered this program in January 1976 and, at that time, assigned the Institute of Small-Scale Industries the responsibility of serving as the counterpart unit to OIP for this program.

University of Science and Technology

The Technology Consultancy Centre (TCC) of the University of Science and Technology began its work in January 1972. Since it was established, TCC has been engaged in promoting small-scale industries by means of offering technical advice, undertaking product development, and establishing production units both on and off the university campus.

Throughout the past few years, TCC has gained much experience in working with self-employed craftsmen, entrepreneurs, and cooperatives. Since 1972, TCC has established a number of production units which have yielded useful, pragmatic experience in commerce and industry under Ghanaian conditions. These production units manufacture such items as steel bolts and nuts, bar soap, and textile products.

In June 1977 the University of Science and Technology entered this program, replacing the University of Ife. TCC was assigned to serve as the counterpart unit to OIP at that time.
Objectives

The continuing objectives of this long-term program were clearly defined initially, and they have been reviewed by the sponsor at each of two in-depth reviews conducted since January 10, 1974. The objectives are threefold:

1. To encourage selected developing country organizations to focus on employment generation through programs which accelerate the expansion of existing industry and the creation of new small industries.

2. To demonstrate and document the impact of alternative approaches to the stimulation of small industry.

3. To create in the appropriate governmental, industrial, and financial sectors of small industry an awareness of potentials and ways to maximize these potentials.

Each of the five counterpart projects (B-426, B-427, B-455, B-463, and B-492) that were active during this fourth year have their own specific objectives which coincide with the overall project philosophy and goals of the main project (A-1600). To further insure compliance with these program objectives, the project administration established two main areas of activity for the OIP staff: (1) training of selected counterpart staff both on site and in the U.S.A. and (2) provision of on-site consultative services to the different programs implemented by the grantee institutions. It was also established that the OIP project staff would assist the counterpart teams in providing managerial, engineering, scientific, and technical assistance to selected small and medium-size industries in the participating host countries. All of the established objectives for Year IV were met during this reporting year.

Total Project Goals of the AID/ta-c-1062 Contract

At the start of the Small-Scale Industry Grant on January 23, 1974, the following total goals for the Georgia Tech grant were established by the sponsor, the Agency for International Development, to be achieved over the life of the program:

The general objective of this contract is to generate employment in developing countries, particularly outside the metropolitan centers by: (a) strengthening the capability of a selected institution in each country to provide effective technical assistance to local small industry, (b) demonstrating and documenting the impact of alternative
approaches to technical assistance to small industry, and (c) infusing the governmental, industrial and financial sectors of the local community selected to provide employment with the understanding of the techniques of generating jobs. The above objectives will be carried out through the use of grants to selected Lesser Developed Country (LDC) organizations.

Once the total project goals are attained, the sponsor anticipates the following outputs:

1. Increased job opportunities in four countries.
2. Increased viability of indigenously owned enterprises.
3. Improved capability of four LDC institutions to serve small industry.
4. Tested methodologies for strengthening LDC institutions.
5. Evaluation report on successes and failures in assisting small industry.

The total project goals have been met over the past four years plus several additional accomplishments during this past year which are presented in further detail in the balance of this final report.

Programs of Work

The role of the Office of International Programs is to serve as the administrator of the program, providing guidance to the participating institutions in designing and developing their own projects, providing advice and counsel as required, suggesting alternative options for their consideration, monitoring the implementation, and in general providing the necessary leadership to assure the desired positive results mentioned in the project goals.

The OIP Project Director has provided, for the past four years, suggested programs for each of the counterpart institutions. These suggested programs were reviewed and modified by the counterpart project directors and their staffs in order to meet their own goals and established needs. In an attempt to create a basis for some degree of comparison and to establish criteria applicable to all projects, the following guidelines were recommended to be incorporated in all counterpart projects:

1. **Counterpart Organization Functional Activities**
   
a. **Organization.** The counterpart will administratively designate a unit to mount a program of research, service, training, and
technical information for the small industry sector. Staff personnel will design the program based on the organization's goals and motivations.

b. **Facilities and Staff.** The counterpart will provide adequate office, equipment, and other resources to the designated unit to permit its staff to function effectively. Staff personnel who have appropriate backgrounds and who, with appropriate training, can implement the program of assistance will be assigned to the unit.

c. **Technology Transfer.** An information collection will be established by the counterpart, where one does not exist already, to permit the staff to conduct research on industrial problems, needs, processes, and products, especially as they relate to small-scale industry, and to disseminate technical information.

d. **Delivery System.** The counterpart will design and implement a procedure to permit direct contact with small industries and entrepreneurs for the purpose of ascertaining their needs and problems and for the provision of staff assistance and research in the solution of problems, both management and technical in nature. This industrial extension activity will have as its aim the establishment of new industry and the expansion and diversification of existing industry.

e. **Education and Training.** The counterpart will design and deliver appropriate training programs related to small-scale industry. Educational programs related to industrialization will be encouraged.

2. **Independent Continuing Activities.** The counterpart will design, in cooperation with the OIP Project Director, a specific program of continuing activities which should include, but not be limited to, the following major subject areas:

   a. **Research Activities.** For example, this could be in the areas of: (1) preparation of case histories; (2) approaches leading to employment generation; (3) analysis, evaluation, and development of new industrialization techniques (if appropriate), products, and processes. Other research activities also will be considered.
b. **Industrial Extension Activities.** This should be a pragmatic type of program related directly to serving the new and existing small-scale industries. Sample activities would be: (1) industrial problem-solving; (2) advice to and consultation with industry; (3) survey of small-scale industry problems and needs.

c. **Training Activities.** The counterpart institution should consider the possibility of providing on-site training to persons in industry. This training may be to management, supervisors, or employees, as needed. Some sample subjects to be considered are: (1) market analysis, (2) small industry operation, and (3) industrial processes.

d. **Educational Activities.** This is an option, but if the counterpart is an educational institution, it is highly recommended.

e. **Training and Consultation.** This task will be the responsibility of the OIP staff. As needed, selected counterpart institution staff will receive appropriate training at the OIP headquarters in Atlanta, Georgia. The training may take various forms as appropriate, including classroom work, on-the-job training, consulting and advisory services, plant tours, and other pertinent topics.

Using the established program guidelines, the individual counterpart institutions then developed their corresponding programs for this year. The individual programs are summarized as follows:

**B-426--Soong Jun University (SJU)**

1. **Technical/Managerial Assistance.** Three main areas of activities were considered under this heading: (a) technical assistance was to be continued, with emphasis to be placed on mechanical, electrical, textile, chemical and electronic engineering; (b) managerial and industrial engineering assistance would be continued and expanded, with emphasis on quality control and industrial management techniques; (c) the efficient management of energy was to be given a high priority, particularly in the case of Korean small-scale industry, due to the extremely high cost of energy in that country.

2. **Solar Energy and Small-Scale Industries.** With continuing technical assistance provided by OIP, the engineering staff at SJU planned to attempt to develop simple and inexpensive devices to better utilize solar energy.
During the previous program year, an experimental solar collector was built and placed under observation at SJU. In Year IV, research would be aimed at a more efficient and less expensive design in the hopes of being able to produce and market the new design by late 1978.

3. Appropriate Technology. In the past, the SJU staff had been engaged in the development of appropriate technology, such as the "cheegay," the simple tensile strength tester, the shaving dies, and the immersion pyrometer. During Year IV of the program, the "cheegay" would be redesigned to reduce the weight and cost and local manufacturers would be sought for production of the newly designed "cheegay."

4. Organizational Linkages and Information Exchange. From its inception, this program has provided for a flow of information from the OIP International Development Data Center to the SJU Small-Scale Industry Information Center. This would be continued during the fourth program year, and the SJU Center was to make this information available to local small-scale industries.

5. Training Programs. As in the past, SJU would continue to offer seminars for industrial managers; short-term courses for owners, manager, and engineers of selected companies; and special programs for industry and government participants on such subjects as quality control and energy management.

6. Educational Activities. This would be the third year of operation for SJU's new Industrial Engineering Department, which was established as a result of this program. In addition, it was planned that the following activities be carried out:

a. Training seminars for both faculty and students.
b. Assessment of the joint program.
c. Development of written and audiovisual case histories.
d. Possible U.S. training of faculty staff.

B-427--Fundacao Educacional do Sul de Santa Catarina (FESSC)

1. Basic Data Center (CDB). The holdings of the CDB had increased consistently since Year I, and it was planned that an additional 2,000 units would be added to the collection during Year IV. It was further decided that
special emphasis would be given to the following areas of CDB activities:

a. Increased acquisition of technical books, manuals, and periodicals.

b. Collection, classification, and dissemination of pragmatic, up-to-date information and Brazilian and international material relevant to small-scale industry.

c. Increased interaction between CDB and other national and international collections that are active in the field of small-scale industries.

d. Continued backup by the OIP International Development Data Center as needed and requested by the CDB staff.

2. Center for Management and Technical Assistance (CETEG). This had been identified as the strongest unit that has developed from this project over the past three years. The following activities were planned for Year IV:

a. Continue to provide continuous technical assistance service to a total of 10 companies.

b. Expand the discontinuous (as needed) technical assistance service to a total of 40 companies during this year.

c. Conduct and complete four feasibility studies.

d. Determine, select, and complete 12 manufacturing opportunity studies.

e. Prepare two management guidelines for small-scale industries.

f. Train four staff members.

g. Continue the audiovisual case histories and documentation started during Year I and continued in Years II and III.

3. Adaptive Technology Center (CATT). For Year IV, the main thrust would be in trying to gain funding from national sources to help in establishing a Technology Center on campus. Designs were being made for the building and needed inputs had been identified by the end of Year III. The OIP representative on site planned to work closely with the CATT staff in developing guidelines, initiating activities, determining needs, identifying future requirements and, in general, providing other assistance as needed during the year.

4. Industrial Training and Education. This activity would be implemented by the newly created Department of Permanent Education (DEP), a
spin-off of the original Center for Permanent Education (CEP) established by this program during Year I. The FESSC staff, assisted by OIP on-site staff, planned to present short courses, lectures, and workshops. Two lecture series were planned for presentation by OIP on-site staff and one by FESSC staff. It was further planned to offer no less than 15 industrial training courses during the year in accordance with local manpower requirements and industrial job generation.

5. **Special Projects.** This new unit of DPD would be established during the year and in the future would (a) continue as a special projects unit, (b) serve as a breeding ground for other units, or (c) take up a more specific orientation. At first, the new unit also would be used for proposal generation, promotion, identification of sources of funding, and similar activities.

B-455--University of Ife (UI)

1. **Establishment of an Extension Service.** A primary objective within the UI project was to establish an industrial extension service. During the previous program year (July 1975-June 1976), two extension offices—one each at Ile-Ife and Ado-Ekiti—had been established. For this program year (July 1976-June 1977), two additional offices were scheduled—one each at Agbor and Ilorin.

2. **Basic Data Center.** The OIP staff, together with the counterpart staff, had identified the need for the establishment of a Basic Data Center to provide the economic, technical, and development information that the counterpart staff needed both at Ife and in the extension offices. The Basic Data Center was to be created, established, funded, and become operational by June 1977.

3. **Management Development.** A management Development Division had been established in the first project year. In the second year, this component was to be strengthened to make it capable of assuming the administration and operation of the industrial extension service.

4. **Industrial Training and Education.** The first priority was the training of UI staff, both at Ife and at OIP in Atlanta, Georgia. Two programs were scheduled; one was to be presented in two segments at Ife by OIP staff during the months of November 1976 and February 1977, and the second training program was to be conducted at OIP in Atlanta, Georgia, during March 1977.
5. **Studies.** The UI staff was scheduled to conduct a techno-economic survey of three states—Ogun, Oyo, and Ondo. This team effort would be assisted by the OIP staff on site during the year. The study was to be funded by the federal government and to be used for rural development planning in the future.

B-463—University of the Philippines, Institute for Small-Scale Industries (UP/ISSI)

1. **Extension Service.** In the first year of this project (January 1975-January 1976), an extension service had been initiated and the first extension office had been established at Tacloban City. In Year II, the office would start providing such services as: (a) management and technical short courses; (b) seminars for selected industries; (c) seminars for development of entrepreneurship. On the more pragmatic subject of extension services, the following activities were scheduled: (a) response to general inquiries via reports, relevant publications, and direct hands-on response; (b) general management/technical assistance and consultancy on site; (c) feasibility studies oriented to the development of new enterprises; and (d) entrepreneur support, particularly to those establishing new activities.

2. **Research.** The counterpart staff would continue conducting applied research projects to provide the following types of studies: (a) provincial surveys, (b) industry profiles, (c) technical studies, and (d) industrial product research. The OIP staff would provide the necessary technical backup.

3. **Industrial Training and Education.** During this year, the OIP staff would continue to upgrade, through training, the skill levels and performance effectiveness of the counterpart staff. It was further planned that one UP/ISSI staff member would participate in a three-month training program at OIP headquarters in Atlanta, Georgia. An in-house seminar would be presented on entrepreneurship development for participants from the developing Region VIII of the Philippines.

4. **Linkages.** The UP/ISSI staff would continue to seek out and establish linkages with other national and international agencies and organizations involved in or related to small-scale industry or appropriate technology. If possible, new linkages would be created in other cities of the region, such as Osmoc, Baybay, Maasin, Calbayog, Catbalogan, and Catarman.
Baseline Study. As the first activity in this first year of the project at UST/TTC, the compilation of selected baseline data on a national and regional (Ashanti) basis for Ghana was considered necessary in order to establish a benchmark.

2. Industrial Training and Education. The OIP staff considered that professional training of the UST/TCC staff was required at this time. It was anticipated that these staff training programs could include the following: (a) field office management for industrial extension services, (b) industrial data gathering and dissemination for nonurban users, and (c) feasibility analysis for extension office staff.

3. Research. Related research activities for the counterpart staff should cover such topics as: (a) studies of profitability and labor productivity, appropriate technology, alternative sources for raw materials; and (d) techniques for ferrous and nonferrous castings.

4. Applied Research. One of the objectives for this year was to develop a project to demonstrate pyrolysis as a feasible and economical alternative energy source for Ghana and possibly for other developing countries. The Building and Road Research Institute (BRRI) had already indicated an interest in this possible study. If developed, the pyrolytic converter system would be used to provide energy for the BRRI brick kiln at TCC.

All of the counterpart programs presented in this section are described in full in each of the corresponding country reports for this year as published by the Georgia Institute of Technology.

Use of Grant Funds

Each of the above grantees was funded for a one-year period in the amount of $45,000. Disbursements of these funds are shown in Tables 1 through 5 for the corresponding counterpart institutions.

Of the five counterpart institutions described in this report, the two that have completed four years in the program have shown commitment to the program by investing their own funds in their respective projects. Over a four-year period, SJU has spent $234,250 on this project, of which $180,000
(76.8%) was funded by the AID grant and $54,250 (23.2%) was contributed by SJU. In the case of FESSC, a total of $387,569 has been spent in the past four years, of which $180,000 (46.4%) was granted by AID and the balance of $207,569 (53.6%) was contributed by FESSC from its own funds. The University of Ife has not reported its disbursement of funds for the last year; consequently, no data are available at this time. The University of the Philippines is starting to invest in the program; over the past two years a total of $93,132 was spent in its project, of which $90,000 (96.6%) came from the AID grant and $3,132 (3.4%) was from internal funds. The University of Science and Technology is six months into its first year. An estimated total of $135,000 will be spent by June 30, 1978, of which $45,000 (33.3%) will be from the AID grant and $90,000 (66.7%) from its own funds.
### Table 1
**DISBURSEMENT OF GRANT AND PROJECT FUNDS**
**SOONG JUN UNIVERSITY (B-426)**
**YEARS I-IV**
**(in dollars)**

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Funds by Source</th>
<th>Year I</th>
<th>Year II</th>
<th>Year III</th>
<th>Year IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>SJU*</td>
<td>Total</td>
<td>AID</td>
<td>SJU*</td>
<td>Total</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
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<td></td>
<td></td>
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<tr>
<td>Travel</td>
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<td>4,810</td>
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<td>4,000</td>
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<td>Local</td>
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<td></td>
<td>1,500</td>
<td></td>
<td></td>
<td>2,000</td>
</tr>
<tr>
<td>Materials and Supplies</td>
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<td></td>
<td>2,900</td>
<td></td>
<td></td>
<td>2,000</td>
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<td>1,000</td>
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<td>1,000</td>
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<td>2,000</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td></td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
</tr>
<tr>
<td>% Participation: AID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SJU*</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

*Includes cost sharing from industry, university and foundations.
## Table 2
DISBURSEMENTS OF GRANT AND PROJECT FUNDS
FUNDACAO EDUCACIONAL DO SUL DE SANTA CATARINA (B-427)
YEARS I-IV
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Year I</th>
<th></th>
<th>Year II</th>
<th></th>
<th>Year III</th>
<th></th>
<th>Year IV</th>
<th></th>
<th>Project Total</th>
<th>Years I-IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>FESSC*</td>
<td>Total</td>
<td>AID</td>
<td>FESSC*</td>
<td>Total</td>
<td>AID</td>
<td>FESSC*</td>
<td>Total</td>
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<td>-</td>
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<td>90,789</td>
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<td>Travel</td>
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<td>2,000</td>
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<tr>
<td>International</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4,000</td>
<td></td>
<td>4,000</td>
<td></td>
<td>-</td>
<td>2,000</td>
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<td>500</td>
<td>500</td>
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<td>3,191</td>
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<td>3,204</td>
<td>3,204</td>
<td></td>
<td>3,110</td>
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<td>20,500</td>
<td>20,500</td>
<td>20,500</td>
<td>20,500</td>
<td>20,500</td>
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<tr>
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<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
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<td>2,000</td>
</tr>
<tr>
<td>Consultants (Local)</td>
<td>-</td>
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<td>-</td>
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<td>4,350</td>
<td>4,350</td>
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<td>-</td>
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<td>-</td>
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<td>6,610</td>
<td>-</td>
<td>6,610</td>
<td>-</td>
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<td>Other (Publications)</td>
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<td>-</td>
<td>-</td>
<td>4,737</td>
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<td>45,000</td>
<td>22,500</td>
<td>67,500</td>
<td>45,000</td>
<td>103,139</td>
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<td>% Participation: AID</td>
<td>100.0%</td>
<td>-</td>
<td>66.6%</td>
<td>-</td>
<td>30.4%</td>
<td>-</td>
<td>35.5%</td>
<td>-</td>
<td>46.4%</td>
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</tr>
<tr>
<td>FESSC*</td>
<td>0.0%</td>
<td>-</td>
<td>33.4%</td>
<td>-</td>
<td>69.6%</td>
<td>-</td>
<td>64.5%</td>
<td>-</td>
<td>53.6%</td>
<td></td>
</tr>
</tbody>
</table>

*Includes cost sharing from federal and state governments as well as industry.
Table 3
DISBURSEMENT OF GRANT AND PROJECT FUNDS
UNIVERSITY OF IFE (B-455)
YEARS I-II
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Year I</th>
<th>Year II</th>
<th>Project Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UI*</td>
<td>Total</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
<td></td>
<td>133,738</td>
<td>133,738</td>
</tr>
<tr>
<td>Travel</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>2,490</td>
<td>8,300</td>
<td>10,790</td>
</tr>
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<td>Materials and Supplies</td>
<td>15,770</td>
<td>53,950</td>
<td>69,720</td>
</tr>
<tr>
<td>Conferences/Seminars</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Training Courses</td>
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</tr>
<tr>
<td>Publications</td>
<td>-</td>
<td>1,826</td>
<td>1,826</td>
</tr>
<tr>
<td>Overhead</td>
<td>-</td>
<td>20,059</td>
<td>20,059</td>
</tr>
<tr>
<td>Technical Equipment</td>
<td>-</td>
<td>47,791</td>
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<tr>
<td>Total</td>
<td>45,000</td>
<td>276,454</td>
<td>321,454</td>
</tr>
</tbody>
</table>

% Participation:  
AID: 14.0%  
UI*: 86.0%

*Includes cost sharing from government sources.

1/ Of the $45,000 grant, $11,434.87 was not spent and was returned to sponsor.
Table 4
DISBURSEMENT OF GRANT AND PROJECT FUNDS
UNIVERSITY OF THE PHILIPPINES (B-463)
YEARS I-II
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Year I</th>
<th>Year II</th>
<th>Project Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UP*</td>
<td>Total</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
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<td>-</td>
<td>4,200</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>5,600</td>
<td>-</td>
<td>5,600</td>
</tr>
<tr>
<td>Local</td>
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<td></td>
<td>1,300</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>3,300</td>
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</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Equipment</td>
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<td>8,100</td>
</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td>-</td>
<td>45,000</td>
</tr>
</tbody>
</table>

% Participation:  AID  100.0%  93.5%  96.6%
UP  0.0%  6.5%  3.4%

*Includes cost sharing from other sources.
Table 5
ESTIMATED DISBURSEMENT OF GRANT AND PROJECT FUNDS
UNIVERSITY OF SCIENCE AND TECHNOLOGY (B-492)
YEAR I
(in dollars)

<table>
<thead>
<tr>
<th>Estimated Expenditures</th>
<th>Year I*</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UST**</td>
<td>Total</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
<td>-</td>
<td>90,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Travel</td>
<td>3,000</td>
<td>-</td>
<td>3,000</td>
</tr>
<tr>
<td>International</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>3,000</td>
<td>-</td>
<td>3,000</td>
</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Equipment</td>
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</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td>90,000</td>
<td>135,000</td>
</tr>
</tbody>
</table>

% Participation:  
AID: 33.3%  
UST: 66.7%

* Year I ends on June 30, 1978.

**Includes cost sharing from other sources.
Highlights of the activities implemented by the five counterpart institutions that were funded by the AID grant during all or part of Year IV (January 10, 1977, to January 9, 1978) are presented in this section. For full details, the reader is referred to the individual reports published for each counterpart under their respective project numbers.

Soong Jun University (SJU)

1. Technical/Managerial Assistance. According to the records of the SJU staff, during this year 13 companies were provided with technical assistance by the Seoul campus staff and another 15 by the Taejon campus staff for a total of 28 companies. Also during the year, the SJU/OIP staff was able to obtain a loan of $125,000 from the Asian Development Bank for one of the companies being serviced under this project. The new plant is now under construction and scheduled to go into operation early in 1978. This new facility will permit plant employment to be augmented substantially. Figure 1 presents one of the companies assisted during this program year.

Figure 1

CHUNIL AUTOMOBILE INDUSTRY CO., LTD.
(Fabricator of components for front-end steering mechanisms and suspension)
2. **Employment Generation.** The project staff conducted a survey of 17 companies (seven served by the Seoul campus staff and 10 by the Taejon campus team) that had received technical/management assistance at some time during the four-year period (1974-1977). The survey indicated a gain of 120 jobs during 1977. Tables 6 and 7 summarize the employment changes as reported by the SJU staff on each of the two campuses.

3. **Energy and Small-Scale Industries.** Several items of solar energy hardware either had been developed or were being developed by December 1977. They included continuing work on the solar flat-plate collector reported last year. A second-generation collector has now been designed using lighter materials and less costly indigenous raw materials. Also during the year, an experimental solar water heater was built at Ma Dong Village in Wae-San Myon by staff from the Taejon campus. The third energy item was a windpower-driven water pump designed by the Seoul campus staff. Figure 2 shows the original plate collector designed by SJU staff.

**Figure 2**

*SJU SOLAR PLATE COLLECTOR*
Table 6
SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES ASSISTED BY SJU SEOUL CAMPUS, 1977-1978

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>+16</td>
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<tr>
<td>7</td>
<td>98</td>
<td>105</td>
<td>+7</td>
</tr>
<tr>
<td>Total</td>
<td>460</td>
<td>582</td>
<td>+122</td>
</tr>
</tbody>
</table>

Table 7
SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES ASSISTED BY SJU TAEJON CAMPUS, 1977-1978

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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<td>*</td>
<td>-14</td>
</tr>
<tr>
<td>B</td>
<td>23</td>
<td>23</td>
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</tr>
<tr>
<td>C</td>
<td>95</td>
<td>98</td>
<td>+3</td>
</tr>
<tr>
<td>D</td>
<td>60</td>
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<tr>
<td>E</td>
<td>26</td>
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<td>66</td>
<td>0</td>
</tr>
<tr>
<td>J</td>
<td>31</td>
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<tr>
<td>Total</td>
<td>350</td>
<td>348</td>
<td>-2</td>
</tr>
</tbody>
</table>

*Industry closed.
4. **Appropriate Technology.** Again this year, the SJU staff concentrated their efforts on the development of an improved "cheegay." Two new models were designed based on previous testing, and prototypes were fabricated; later both prototypes were field tested in actual urban-rural situations. A local manufacturer has decided to manufacture 500 units on speculation and test market them during Year V of the project. The staff at the Taejon campus worked on the development of a semiportable methane gas generator using animal dung as raw material.

5. **Organizational Linkages and Information Exchange.** During the year, SJU established linkages with the Korea Credit Guarantee Fund (KCGF), the Korean Federation of Small Business (KPSB), the Korean Ministry of Commerce and Industry (KMCi), and the Korea Medium Industry Bank (KMIB). The SJU staff also provided information and assistance to many other local organizations. They conducted seminars on: (a) management and technical improvement of small business, (b) management improvement for the Korea Communications Instrument Manufacturing Industry Association, (c) the future role of small business in the Korean national economy, and (d) technology improvement for small industries, as well as other interesting and appropriate seminars.

6. **Educational and Training Activities.** Five industrial seminars were offered by the SJU staff to managers and staff members of small industries; some 40 firms responded by sending participants. A three-hour in-house training program on regional development was presented to some 300 students and faculty members. Also this year, a seminar on future forecasting was presented by the counterpart staff. A four-day course on "Development, Cooperation and Labor Studies" was offered in June and attended by students at SJU. Dr. Bum Soe Koh, President of SJU, represented the institution at a four-day conference in Guatemala City, Guatemala, sponsored by OIP and AID.

7. **Publications.** Four publications were completed by the SJU staff during this program year, as follows:

   a. "A Case Study on the Possibility of Improving Simple Traditional Farm Equipment in Korea"
   b. Theory and Practice of Community Development
   c. Monograph on the Cheegay
   d. "A Case History of Industrial Extension Service (Sam-Shin Sewing Machine Company)"

-30-
8. Audiovisual Documentation. The fourth year of audiovisual documentation was completed by the joint project staff. This year's audiovisual documentation covers some of the old technical assistance cases presented in Years I-III as well as some selected new cases. Copies of the corresponding tapes and photographs have been made available to the sponsor and counterpart institution.

9. Other Activities. The grant to SJU for Year IV also generated other significant activities of benefit to the grantee. For example: (a) the Presbyterian Church in the United States granted SJU $8,500 for an Anti-Hunger Program which included support for a biogas generator and simple solar hardware; (b) the Korea Credit Guarantee Fund granted $10,000 to further support the extension service in 1978; (c) the Korean Ministry of Education granted $5,000 for research in wind power; (d) the Foundation of the Korean Trade Association granted $3,000 for research programs related to industrial extension activities; and (e) a grant is anticipated from the Asia Foundation for research programs in the area of appropriate technology.

Figure 3, on the following page, is the Project Plan for the activities scheduled for Year IV.

Fundacao Educacional do Sul de Santa Catarina (FESSC)

1. Basic Data Center (CDB). During Year IV the CDB greatly expanded its holdings and users of the system. New acquisitions were on the order of 1,972 items plus well over 1,500 additional newspaper clippings (about two full file cabinet drawers). Table 8 presents the acquisitions made by the CDB for this program year. It must be noted that following the 1974 flood, the CDB collection contained only 241 units; since that time, the collection has grown to over 4,200 units, not counting newspaper clippings.

At the suggestion of the Project Director, the CDB staff initiated a register at the start of the 1976-1977 year in order to record the number of users of the CDB collection. The first year the register was kept, 106 requests were recorded for information; this year, 526 requests were made for information to the CDB staff, or nearly five times as many as the previous year.

2. Center for Management and Technical Assistance (CETEG). The staff of CETEG has been actively providing management and technical assistance to the
### Project Plan

**Project No.:** B-426 - Year IV  
**Project Title:** SIG - Soong Jun University  
**Project Director:** Nelson C. Wall

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**Quarterly Reports:**

**Annual Report:**

**LEGEND**
Table 8
CDB - PUBLICATIONS ACQUIRED
FESSC, PROGRAM YEAR 1977-1978

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<thead>
<tr>
<th>Type of Publication</th>
<th>Items Added to Collection</th>
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<tr>
<td>Periodicals</td>
<td>1,187</td>
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<tr>
<td>Annuals</td>
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<tr>
<td>Articles</td>
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<tr>
<td>Catalogs</td>
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<tr>
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<td>38</td>
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<tr>
<td>Maps</td>
<td>31</td>
</tr>
<tr>
<td>Reports</td>
<td>39</td>
</tr>
<tr>
<td>Profiles</td>
<td>-</td>
</tr>
<tr>
<td>Monographs</td>
<td>4</td>
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<tr>
<td>Journals</td>
<td>20</td>
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<tr>
<td>Censuses</td>
<td>9</td>
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<tr>
<td>Calendar</td>
<td>-</td>
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<tr>
<td>Studies</td>
<td>67</td>
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<tr>
<td>Booklets</td>
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<tr>
<td>Pamphlets</td>
<td>44</td>
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<tr>
<td>Newspaper Clippings</td>
<td>1,931*</td>
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<tr>
<td>Miscellaneous</td>
<td>132</td>
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<td><strong>Total</strong></td>
<td><strong>1,972</strong></td>
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</table>

*Newspaper clippings not included in total.

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Table 9
TECHNICAL AND MANAGEMENT ASSISTANCE CASES
FESSC, 1977-1978

<table>
<thead>
<tr>
<th>Industrial Activity</th>
<th>No. of Cases</th>
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<tbody>
<tr>
<td>Mining-Nonmetallic</td>
<td>6</td>
</tr>
<tr>
<td>Mechanics and Metallurgy</td>
<td>9</td>
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<tr>
<td>Electrical Machinery</td>
<td>1</td>
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<tr>
<td>Wood and Wood Products</td>
<td>3</td>
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<tr>
<td>Furniture</td>
<td>2</td>
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<tr>
<td>Chemistry, Cosmetics</td>
<td>1</td>
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<tr>
<td>Garments</td>
<td>3</td>
</tr>
<tr>
<td>Food</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
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</table>
small-scale industries located in the two micro-regions of AMUREL and AMSESC, which geographically have an area of 9,500 square kilometers and encompass 32 municipalities. The provision of management and technical assistance has been fairly high for the past four years. In this reporting year, 62 requests were serviced, 34 of which were registered as technical or management assistance cases. These 34 enterprises were distributed over 13 different municipalities of the two micro-regions, and all were in rural areas. Table 9 is a summary of the 34 technical-management assistance cases classified by activities. Figure 4 is representative of one of the woodworking enterprises assisted during the year.

Figure 4
SMALL-SCALE INDUSTRY IN BRAZIL

The CETEG staff, at the request of OIP, has been keeping records since Year I to determine if new jobs have been generated or if productivity and sales have been increased as a result of this program. In this manner, the project administration has been able to quantify to some degree the direct results or performance of both the project and the counterpart institution. During Year IV, 23 companies were surveyed out of the 34 that received technical assistance during the year, and they reported a net increase in
employment of 667 new jobs. The sales volume information was not available at the time of the writing of this document; it will be reported during the first quarter of 1978, at which time the enterprises will prepare their income tax, sales tax, and production tax forms for the Brazilian authorities. Table 10 presents the employment gain in a more detailed manner.

Also completed during Year IV were 26 publications, reports, studies, and other research documents. They included:

- 3 prefeasibility studies
- 13 new manufacturing opportunity studies
- 3 management guidelines
- 5 industrial studies
- 2 case studies

The titles and a brief summary of each of the above documents appear in the FESSC (B-427) end-of-the-year report published by the Georgia Institute of Technology.

3. Adaptive Technology Center (CATT). When this project was designed in 1974, CATT was to serve as the focal point around which FESSC could start developing engineering or technical disciplines. CATT has been growing slowly for three years, and as part of last year's activity, the joint staff prepared a proposal for the creation of a Technology Center at FESSC which went to state and national authorities. During this fourth project year, the Governor of the State of Santa Catarina, Dr. Konder Reis, funded the project with a grant of 26 million cruzeiros (about $1.8 million) to FESSC for the land, construction, and equipment of a 4,000-square meter building to house the Technology Center.

4. Industrial Training and Education. The Department of Permanent Education (DEP) is a spin-off of the Center for Permanent Education established by this project during Year I. During this past year of the project, the DEP offered 22 different training programs which were completed by a total of 1,294 persons. This continues to be a dynamic portion of the total project and one that has been well received by the general public.

5. Audiovisual Documentation. The fourth annual audiovisual documentation was scheduled for mid-1977 but, unfortunately, the photographic equipment being carried by a member of the OIP staff was confiscated by a customs
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Employment, 1977-78</th>
<th>Variation</th>
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<tr>
<td></td>
<td>Start</td>
<td>End</td>
</tr>
<tr>
<td>Isaltino Padina Lima</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>INEL</td>
<td>122</td>
<td>98</td>
</tr>
<tr>
<td>Warmeling &amp; Filho</td>
<td>35</td>
<td>35</td>
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<tr>
<td>Gino Acessorios</td>
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<td>9</td>
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<tr>
<td>Mel-Metalurgica Equipe</td>
<td>13</td>
<td>25</td>
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<tr>
<td>Mecanica ABC</td>
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<td>INOCESA</td>
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<td>Metasul</td>
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<td>Irmaos Tiskoski</td>
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<td>Inarca</td>
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<td>Radflex</td>
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<td>Moveis Santa Barbara</td>
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<td>Quimica dois Irmaos</td>
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<tr>
<td>Haroldo Zanetta</td>
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<td>Equipe Representacoes</td>
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<tr>
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<tr>
<td>MADEPLAC</td>
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<td>93</td>
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<td>INCAL</td>
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<tr>
<td>Industrias Coventos</td>
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<td>530</td>
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<td>FUSIMEC</td>
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<tr>
<td><strong>Total</strong></td>
<td>2,309</td>
<td>2,976</td>
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</table>
officer in Rio de Janeiro and it was nearly impossible to carry out the assignment. Nevertheless, a limited number of videotapes were made, thanks to the audiovisual section at FESSC, their staff, and the equipment which had been purchased in previous years. Copies of the tapes and still photographs have been made available to the sponsor and the counterpart institution.

6. Other Activities. The training and upgrading of the FESSC staff was continued this reporting year. The FESSC staff provided 190 participants who attended 41 different programs offered elsewhere in Brazil. The OIP staff also completed the final session of an ongoing seminar initiated during Year III. Most of the senior staff members at FESSC attended the seminar offered by the OIP staff.

Figure 5, on the following page, is the Project Plan for Year IV as prepared by the joint Project Directors.

University of Ife

Soon after the end of the first year of implementation of this project (B-455), the Project Director was on site and together with the counterpart staff prepared the final report for that year, which was published by the Georgia Institute of Technology. At the same time, the Project Plan for Year II (July 1976-June 1977) was prepared. (See Figure 6.)

Unfortunately, soon thereafter, the counterpart institution went through an administrative change which resulted in a marked loss of interest in this project. During the reporting year, the counterpart failed to provide OIP with the necessary progress reports and activities apparently came to a near halt.

In view of these circumstances, the following recommendations were made to the sponsor on April 11, 1977, by the OIP administration.

When the original grant to the University of Ife was made on June 25, 1975, the Industrial Research Unit (IRU) was a dynamic unit, heavily involved in small industry research and development. Most active in formation and activities of the IRU were Dr. Sam Aluko and Dr. O. A. Oguntoyo. The administration of the University replaced Dr. Aluko as head of Economics Department and the IRU in October 1976 and Dr. Oguntoyo was relieved of his IRU duties at the same time. Subsequent communications to the new head of the IRU failed to elicit a response. A field trip by Don Lodge of Georgia Tech to the University of Ife in March 1977 revealed that the IRU was stagnant; appointments to field office vacancies were not being made; that field office personnel, with one exception, were no longer providing management assistance to industries; in short, that the
**Project No.** B-427, Year IV  
**Project Title** SIG-FESSC  
**Project Director** Nelson C. Wall

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**Legend**

- Preparation of Final Report, Year III
- Planning Year IV Program
- Selection of New Municipalities
- Selection of New Companies
- On-Site Assistance, N. C. Wall
- On-Site Assistance, H. Davis
- Technical Assistance Service (CETEG)
- Assistance to CDB
- Technical Assistance to CATT
- On-Site Assistance, H. Davis
- Training (Staff)
- Mini-Conference
- Audiovisual Filming on Site
- On-Site Assistance, N. Wall

**Quarterly Reports**

**Annual Report**
Figure 6
PROJECT PLAN
1976 - 1977

LEGEND
grant activities were not being vigorously pursued. Communications in hand from both Drs. Aluko and Oguntoye verify that these conditions have existed for some months. To continue this grant beyond June 24, 1977, would be an obvious waste of funds. We recommend termination and that grant year-end unused funds (about $7,000) be applied to more productive uses under the contract.

On May 24, 1977, the sponsor advised OIP that it concurred with the proposal not to extend the grant agreement and the Georgia Institute of Technology was directed to deobligate any funds not issued to the grantee at that time. The accounting office at the Georgia Institute of Technology then advised the sponsor that a total of $11,434.87 was unspent from the 1976-1977 grant fund; these monies were reallocated by the sponsor within the overall grant to the Georgia Institute of Technology.

To this date, the UI has failed to present a final report for the grant year ending in June 1977; therefore, the author of this report has not been able to present any of their achievements or accomplishments in this report.

University of the Philippines, Institute for Small-Scale Industries (UP/ISSI)

1. Extension Service. The extension office was established in Tacloban City during the previous project year. This year its staff conducted a survey of incentives for rural small-scale industries as well as five feasibility studies. These project feasibility studies were on a sash factory, a welding shop, a rattan furniture plant, a wooden furniture plant, and a memorial park-mortuary-casket manufacturing plant.

Twenty-two local small-scale industries received technical-management assistance during the year. Of these, 11 firms were assisted in the 1976-1977 program year and the other 11 firms entered the program this year. The 22 firms are located on the islands of Stet, Samar, and Leyte.

A survey was conducted of the firms that received technical-management assistance during this year in an attempt to determine if there had been any change in their employment. They reported employing an additional 47 persons during the year, as shown in Table 11.

2. Industrial Training. During the first quarter of 1977, the UP/ISSI staff presented a seminar on entrepreneurship development at Maasin which was completed by 16 persons. One novel feature of the seminar program was to provide follow-up consultancy to the participants. As of the end of the program year, four participants had been motivated to start three new
Table 11
EMPLOYMENT GENERATION WITHIN FIRMS RECEIVING MANAGEMENT-TECHNICAL ASSISTANCE
UP/ISSI, PROGRAM YEAR II

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Start</th>
<th>Finish</th>
<th>Variance</th>
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<tbody>
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<tr>
<td>151</td>
<td>198</td>
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</table>

* Proposed project, business not yet established.

** This firm, excluded from employment count, has had to curtail employment by 78 (from 106 to 28) because of a government ban on cutting its major raw material. The pilot extension office has taken action on this matter, which now awaits government response.
industries and to expand an existing one. Two industries with combined employment of 20 were established soon after the seminar ended; another has received financing from the Development Bank of the Philippines (DBP) and will open as soon as machinery can be delivered. The expansion project (14 new jobs) currently awaits DBP approval.

As has been indicated in another section, the UP/ISSI staff assisted in forming the Tacloban Ironworks and Engineering Industries Association (TIEIA). The membership of the association is composed of owners/managers of small-scale machine shops, welding shops, automotive repair shops, electrical repair shops, and others.

During this program year, the UP/ISSI staff presented a "skills" training program for persons employed by the members of TIEIA. A total of 136 persons completed this course, with participants coming from Tacloban City (80%), other areas of Leyte (11%), and the balance (9%) from Samar and Eastern Samar.

Details of the content of the training program and duration of the course work are offered in the final report for Year II of this project (B-463) published by the Georgia Institute of Technology.

3. Education and Staff Training. A program was presented at the UP/ISSI Diliman campus on the subject of entrepreneurship development. This seminar was attended by 23 faculty members from the educational institutions in Region VIII; they produced a syllabus of courses to be offered to first- and second-year college students enrolled in business administration. The participating faculty members will now introduce the concepts and practices of entrepreneurship to their college-level students.

A senior research assistant of the UP/ISSI staff at Tacloban received a fellowship from Technonet Asia and attended a two-month industrial extension training course at UP/ISSI headquarters. A research assistant, also a staff member at Tacloban, came to OIP in Atlanta for two and one-half weeks of training in industrial extension.

4. Appropriate Technology. During Year II, the Tacloban office staff designed a wooden cart to be used by a local producer of soft-drink boxes to carry raw materials and waste materials to and from the workplace of the machine operator in the plant.

A 3-foot, 8-inch wood lathe powered by a 1-1/2 HP motor also was designed and fabricated during this project year. The lathe cost approximately $100
exclusive of the electric motor, and is now in operation in a local wood product shop. Research was conducted to adapt an improved band saw designed for application in the furniture shops and drink-box factories. It is anticipated that the new design will be completed and the prototype fabricated during Year III.

5. Fermentative Food Processing and Food Preservation. A grant was given to UP/ISSI to prepare a training program on fermentative food processing and food preservation for the Department of Social Services and Development. The project was initiated during the last quarter of 1977 and is still under way.

6. Audiovisual Documentation. The audiovisual documentation initiated during Year I of this project was continued during Year II. Photographs, black and white as well as color, were taken of various project activities and industries being served. A videotape was produced by a staff member of OIP.

7. Other Activities. The counterpart staff began an attempt to organize the furniture and woodcraft plants in Region VIII, following the successful methodology used in creating the TIEIA. UP/ISSI got Mr. A. L. Morales, National President of the Philippine Chamber of Furniture Industries, to come to Tacloban and meet with the interested persons. This work will continue into Year III.

Figure 7, on the following page, is the Project Plan for Year II of this project.

University of Science and Technology, Technology Consultancy Centre (UST/TCC)

When the University of Ife grant was discontinued, the OIP staff recommended to the sponsor that UST/TCC replace UI as a funded counterpart. The sponsor approved the recommendation and UST/TCC received a full one-year grant starting on June 27, 1977. To date, the following activities have been initiated or have been implemented.

1. Training. A member of the TCC staff, Mr. Buatsi, visited the OIP headquarters in Atlanta from November 7-November 25, 1977, to receive two and one-half weeks of training in industrial extension and technical assistance. The training program incorporated various training modes, including tours and exposure to local small-scale industries.
**Project No.** B-463, Year II  
**Project Title** SIG-UP/ISSI  
**Project Director** Nelson C. Wall

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Quarterly Reports  
Annual Report

**LEGEND**
2. **Pyrolysis.** The pyrolysis demonstration project is well under way. The first unit has been constructed and currently is being tested.

3. **Technical Support.** At the request of the counterpart, the OIP staff has completed literature searches and provided materials on:
   - solar energy
   - small-scale foundries
   - sugar refineries
   - tufted textile machinery

   The material gathered has been forwarded to TCC for their future use. Figure 8 presents the Project Plan for the year ending in June 1978.

**Office of International Programs**

Each of the counterpart institutions invested 50% of its grant funds to contract with the Office of International Programs to provide the required technical support, training and consultancy assistance, and the audiovisual documentation of the individual projects. Detailed accounts of actions taken and on-site assistance provided are presented in the corresponding end-of-the-year reports for each project (B-426, B-427, B-455, B-462, and B-492) published by the Georgia Institute of Technology, copies of which have been submitted to the sponsor.

A number of members of the OIP staff were on site during Year IV to provide contractual support to these projects. Listed below are the names of OIP staff members who were on site under these projects during the 1977-1978 program year. Nearly all the visits were funded by the corresponding project; those marked with an asterisk were funded under an AID 211(d) grant to the Georgia Institute of Technology.

**Soong Jun University (B-426)**

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<td>W. M. Sangster*</td>
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<td>Oct 10-Oct 18, 1977</td>
<td>R. W. Hammond*</td>
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<td>Oct 10-Oct 18, 1977</td>
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<td>Nov 13-Nov 19, 1977</td>
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<td>Nov 13-Nov 26, 1977</td>
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**Project No.** B-492  
**Project Title** Small-Scale Industry Program - TCC  
**Project Director** Nelson C. Wall

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**Legend**
Fundacao Educacional do Sul de Santa Catarina (B-427)

April 14-April 22, 1977
L. H. Davis

May 5-May 20, 1977
N. C. Wall

July 17-July 28, 1977
L. H. Davis

July 24-July 29, 1977
Edwina Udunka

December 1-December 22, 1977
N. C. Wall

University of Ife (B-455, July 1976-June 1977)

July 3-August 7, 1976
N. C. Wall

August 1-August 7, 1976
Edwina Udunka

March 11-March 19, 1977
Donald E. Lodge

University of the Philippines (B-463)

March 2-April 1, 1977
K. Powell

June 28, 1977
R. W. Hammond*

August 5-August 29, 1977
D. E. Fyffe

November 2-November 13, 1977
Donald E. Lodge

November 5-November 13, 1977
Edwina Udunka

University of Science and Technology (B-492, June 1977-January 1978)

July 10-July 30, 1977
Donald E. Lodge

July 17-July 23, 1977
Edwina Udunka

December 4-December 9, 1977
P. W. Potts*
ACCOMPLISHMENTS

The previous section of this report recapitulated the individual activities and achievements of each of the five counterparts for Program Year IV. At this time, a brief review will be made of accomplishments, changes, and other quantifiable indicators that point out the overall benefits and effect of this program in the respective host countries and for the counterpart institutions that have been active for two or more years, up to a total of four years.

Soong Jun University (1974-1978)

At the start of the project in 1974, the staff of SJU, assisted by the OIP on-site staff, gathered detailed information on population, land areas, existing industries, and other data. These facts were presented in a Baseline Data report published by the Georgia Institute of Technology in 1975.

The counterpart staff has actively pursued the concept of appropriate technology and, over the past four years, has developed, built, and field tested 10 appropriate technology devices. These devices are:

- Low-cost tensile tester
- Sizing or shaving die for truing up metal rod cross sections
- Low-cost immersion pyrometer
- Flat-plate solar collector
- Multi-tapping machine
- Drilling fixture
- Filter press
- Bicycle brake testing device
- Semiportable methane gas generator
- Third-generation "cheegay" (traditional backpack)

The last two were developed during Year IV of this project. The latest version (third generation) of the cheegay appears as Figure 9 of this report.

One indicator used in this project to determine the possible impact of the services provided has been "employment generation." Since 1974 the project staff has monitored the employment variance in some of the small-scale industries that have received management-technical assistance from the SJU staff. Table 12 presents the variance reported by the counterpart staff in the monitored industries.
Figure 9
THIRD-GENERATION "CHEEGAY"

Table 12
VARIATION IN EMPLOYMENT OF COMPANIES RECEIVING TECHNICAL ASSISTANCE
SJU, 1974-1978

<table>
<thead>
<tr>
<th>Year</th>
<th>Monitored Companies</th>
<th>Start</th>
<th>End</th>
<th>Variance</th>
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<tbody>
<tr>
<td>1974-75</td>
<td>19</td>
<td>-</td>
<td>868</td>
<td>-</td>
</tr>
<tr>
<td>1975-76</td>
<td>19</td>
<td>868</td>
<td>1,444</td>
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<td>18</td>
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<td>1977-78</td>
<td>17</td>
<td>810</td>
<td>930</td>
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<tr>
<td>Total Variance</td>
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<td>+513</td>
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</tbody>
</table>

Another project goal has been the provision of management and technical assistance. As was indicated in another section, during Year IV, a total of 28 companies were provided with such assistance by the SJU staff. Table 13 gives the total number of such cases handled in each project year by SJU over the four-year project period.
Table 13
SUMMARY OF MANAGEMENT-TECHNICAL ASSISTANCE CASES
SJU, 1974-1978

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Technical Assistance Cases</th>
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<tr>
<td>1974-75</td>
<td>18</td>
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<tr>
<td>1975-76</td>
<td>28</td>
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<td>1976-77</td>
<td>33</td>
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<tr>
<td>1977-78</td>
<td>28</td>
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<td>107</td>
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</table>

In the field of education, the Department of Industrial Engineering at SJU was established and is presently operating as a direct result of this project. The impact or benefit that this single accomplishment may produce cannot be quantified at this time, but all members of the joint staff consider it to be significant.

The administration of SJU has committed itself to supporting this project. As shown in Table 1, over the past four years, AID has provided $180,000 through this grant and SJU has matched this investment with an additional $54,250. Over the four-year period, the project has disbursed a total of $234,250, of which $54,250 (23.2%) came from internal SJU funds and $180,000 (76.8%) from AID funding. Figure 10, on the following page, is a graphic summary of the year-to-year funding of this project.

In addition to the above funding, SJU has received grants from many other institutions for research projects and general support to the institution. In the 1976-1977 project year, SJU received some $69,500 in grants from the Presbyterian Church U.S., Industry-University Cooperative Foundation, Korean Ministry of Education, and the Korean National Federation of Small Industry Cooperatives. In program year 1977-1978, SJU reported receiving an additional $36,500 in grants from the Presbyterian Church U.S., Korea Credit Guarantee Fund, Korean Federation of Small Business, and the Korean Ministry of Education.

Another significant accomplishment has been in the area of industrial training. Table 14 presents the number of industrial training programs offered over the past four years by SJU.
Figure 10
SOONG JUN UNIVERSITY
GRANT AND PROJECT FUNDS
YEARS I-IV

Dollars

400,000

350,000

300,000

250,000

200,000

150,000

100,000

50,000

AID Funds

Counterpart Institution Funds


-52-
Table 14
INDUSTRIAL TRAINING PROGRAMS
SJU, 1974-1978

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Participants</th>
<th>No. of Industrial Training Programs Offered</th>
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<tbody>
<tr>
<td>1974-75</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>1975-76</td>
<td>NA</td>
<td>5</td>
</tr>
<tr>
<td>1976-77</td>
<td>98</td>
<td>2</td>
</tr>
<tr>
<td>1977-78</td>
<td>310</td>
<td>8</td>
</tr>
<tr>
<td>Four-Year Total</td>
<td>448</td>
<td>16</td>
</tr>
</tbody>
</table>

In addition, several staff training programs were presented both at SJU and at the OIP headquarters. Other educational seminars, conferences, and workshops also were held over the four-year period.

Fundacao Educacional do Sul de Santa Catarina (1974-1978)

The FESSC project also was initiated with the preparation of a detailed study of local population, land area, number of small-scale industries, and other information. These data were published under the title Baseline Data by the Georgia Institute of Technology in 1975. The information gathered indicated a population of 233,266 persons living in AMUREL and 263,519 inhabitants in AMSESC, giving a total for the two mini-regions (32 municipalities) of 496,795 inhabitants. By 1977 the population for the same area was on the order of 570,000 inhabitants.

There is no doubt that both of these mini-regions were showing signs of growth prior to the initiation of this project, but it is also true that the manufacturing/industrial and commercial sectors were the weak points in the economy. Since 1970, the FESSC staff has been keeping records on the revenue from two taxes that are representative of these activities: (a) tax on circulation of merchandise (imposto sobre circulacao de mercadorias--ICM) and (b) industrial production tax (imposto producao industrial--IPI). The increase in revenues from these taxes is presented in Tables 15 and 16. In addition, Table 17 contains the data on the growth of municipal budgets in the two mini-regions and Table 18 has the rate of currency devaluation for the period.
Table 15
REVENUE FROM IPI TAXES, 1970-1976

<table>
<thead>
<tr>
<th>Year</th>
<th>AMUREL</th>
<th>AMSESC</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dollars (000)</td>
<td>Index</td>
<td>Dollars (000)</td>
</tr>
<tr>
<td>1970</td>
<td>260</td>
<td>1.00</td>
<td>590</td>
</tr>
<tr>
<td>1971</td>
<td>332</td>
<td>1.28</td>
<td>962</td>
</tr>
<tr>
<td>1972</td>
<td>426</td>
<td>1.64</td>
<td>1,319</td>
</tr>
<tr>
<td>1973</td>
<td>501</td>
<td>1.92</td>
<td>1,944</td>
</tr>
<tr>
<td>1974</td>
<td>805</td>
<td>3.09</td>
<td>2,646</td>
</tr>
<tr>
<td>1975</td>
<td>1,510</td>
<td>5.80</td>
<td>3,220</td>
</tr>
<tr>
<td>1976</td>
<td>1,846</td>
<td>7.09</td>
<td>3,950</td>
</tr>
</tbody>
</table>

Table 16
REVENUE FROM ICM TAXES, 1970-1976

<table>
<thead>
<tr>
<th>Year</th>
<th>AMUREL</th>
<th>AMSESC</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dollars (000)</td>
<td>Index</td>
<td>Dollars (000)</td>
</tr>
<tr>
<td>1970</td>
<td>2,524</td>
<td>1.00</td>
<td>2,518</td>
</tr>
<tr>
<td>1971</td>
<td>2,943</td>
<td>1.16</td>
<td>3,340</td>
</tr>
<tr>
<td>1972</td>
<td>2,795</td>
<td>1.11</td>
<td>3,927</td>
</tr>
<tr>
<td>1973</td>
<td>3,551</td>
<td>1.41</td>
<td>5,253</td>
</tr>
<tr>
<td>1974</td>
<td>4,478</td>
<td>1.77</td>
<td>6,498</td>
</tr>
<tr>
<td>1975</td>
<td>6,001</td>
<td>2.38</td>
<td>8,638</td>
</tr>
<tr>
<td>1976</td>
<td>7,168</td>
<td>2.84</td>
<td>8,583</td>
</tr>
<tr>
<td>1977</td>
<td>10,083</td>
<td>3.99</td>
<td>12,573</td>
</tr>
</tbody>
</table>
### Table 17

MUNICIPAL BUDGETS (AMUREL AND AMSESC) 1970-1977

<table>
<thead>
<tr>
<th>Year</th>
<th>AMUREL Dollars (000)</th>
<th>AMSESC Dollars (000)</th>
<th>Total Dollars (000)</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1,554</td>
<td>1,936</td>
<td>3,490</td>
<td>1.00</td>
</tr>
<tr>
<td>1971</td>
<td>1,982</td>
<td>2,309</td>
<td>4,291</td>
<td>1.23</td>
</tr>
<tr>
<td>1972</td>
<td>2,305</td>
<td>3,039</td>
<td>5,344</td>
<td>1.53</td>
</tr>
<tr>
<td>1973</td>
<td>2,660</td>
<td>3,805</td>
<td>6,465</td>
<td>1.85</td>
</tr>
<tr>
<td>1974</td>
<td>3,311</td>
<td>4,621</td>
<td>7,932</td>
<td>2.27</td>
</tr>
<tr>
<td>1975</td>
<td>4,184</td>
<td>4,959</td>
<td>9,143</td>
<td>2.62</td>
</tr>
<tr>
<td>1976</td>
<td>4,495</td>
<td>4,701</td>
<td>9,196</td>
<td>2.64</td>
</tr>
</tbody>
</table>

### Table 18


<table>
<thead>
<tr>
<th>Year</th>
<th>Ave. Exchange Rate (Cr/$)</th>
<th>Devaluation</th>
<th>% Inflation</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>0.225</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
</tr>
<tr>
<td>1971</td>
<td>0.200</td>
<td>0.025</td>
<td>11.11</td>
<td>1.12</td>
</tr>
<tr>
<td>1972</td>
<td>0.175</td>
<td>0.025</td>
<td>12.5</td>
<td>1.29</td>
</tr>
<tr>
<td>1973</td>
<td>0.163</td>
<td>0.012</td>
<td>6.9</td>
<td>1.38</td>
</tr>
<tr>
<td>1974</td>
<td>0.140</td>
<td>0.023</td>
<td>14.11</td>
<td>1.61</td>
</tr>
<tr>
<td>1975</td>
<td>0.114</td>
<td>0.026</td>
<td>18.92</td>
<td>1.98</td>
</tr>
<tr>
<td>1976</td>
<td>0.083</td>
<td>0.031</td>
<td>27.31</td>
<td>2.73</td>
</tr>
</tbody>
</table>
The project cannot claim that all the growth in revenue from industrial and commercial taxes was due to the actions implemented, but it is possible that part of this growth is due to the services provided through technical assistance and that these services contributed in some degree to the economic development of the area. Figure 11 presents in a graphic manner the growth rates over the six-year period given in Tables 15, 16, and 17. It is interesting to note that following the March 1974 flood and the initiation of this project, the curves tend to slope upward more acutely and continue to increase sharply for the next four reporting periods.

Another indicator used in determining accomplishments under this project has been the generation of employment. For the past four years, the joint staff has monitored the variance in employment of some of the enterprises receiving management-technical assistance through this project. Table 19 summarizes the employment variance in the monitored companies. All of the companies that were asked to keep track of their employment changes have, on the whole, shown healthy increases in both new jobs and sales volume.

The FESSC staff has been heavily involved in providing on-site technical and management assistance to the small-scale industries of the area. Over the past four years, as shown in Table 20, the staff has responded to 234 requests for assistance, of which 161 were classified as "technical assistance."

<table>
<thead>
<tr>
<th>Year</th>
<th>Monitored Companies</th>
<th>Employment</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Start</td>
<td>Finish</td>
<td>Variance</td>
<td></td>
</tr>
<tr>
<td>1974-75</td>
<td>8</td>
<td>-</td>
<td>109</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>1975-76</td>
<td>8</td>
<td>109</td>
<td>140</td>
<td>+31</td>
<td></td>
</tr>
<tr>
<td>1976-77</td>
<td>17</td>
<td>915</td>
<td>1,991</td>
<td>+1,076</td>
<td></td>
</tr>
<tr>
<td>1977-78</td>
<td>23</td>
<td>2,309</td>
<td>2,976</td>
<td>+667</td>
<td></td>
</tr>
<tr>
<td>Total Variance</td>
<td></td>
<td></td>
<td></td>
<td>+1,774</td>
<td></td>
</tr>
</tbody>
</table>
Figure 11
GRAPHIC PRESENTATION
OF TABLES 15, 16 and 17

IPI

ICM

Municipal Budget

Index

Table 20
SUMMARY OF TECHNICAL ASSISTANCE CASES SERVED BY FESSC, 1974-1978

<table>
<thead>
<tr>
<th>Year</th>
<th>Total No. of Cases</th>
<th>No. of Technical Assistance Cases</th>
<th>No. of Municipalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974-75</td>
<td>45</td>
<td>45</td>
<td>9</td>
</tr>
<tr>
<td>1975-76</td>
<td>57</td>
<td>37</td>
<td>15</td>
</tr>
<tr>
<td>1976-77</td>
<td>70</td>
<td>45</td>
<td>14</td>
</tr>
<tr>
<td>1977-78</td>
<td>62</td>
<td>34</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>234</td>
<td>161</td>
<td>51</td>
</tr>
</tbody>
</table>

The Basic Data Center (CDB) at FESSC has shown tremendous growth since 1974. When the project was initiated, the CDB and most of the city of Tubarao were severely damaged by a freak flood that occurred in March 1974. Figures 12 and 13 are representative of the damages that the flood caused. The CDB was able to salvage 241 units of its collection; since then, the CDB holdings have grown to some 4,290 units. Table 21 presents annual growth data classified by types and numbers of publications acquired, and Figure 14 is a graphic presentation of the growth of the CDB collection. The present holdings are nearly 18 times as large as the original collection salvaged from the flood.

As a result of the research conducted by the FESSC staff, many reports, studies, feasibility studies, new manufacturing opportunity studies, and other documents have been published in the past four years. Since the titles of these publications have been mentioned in the yearly reports on this project, Table 22 shows only the total number published in each category in order to summarize the publications for the project life.

Another accomplishment that needs to be highlighted is in the industrial training field. In the past four years, FESSC has presented 184 industrial training programs and a total of 4,717 persons have completed these programs. The development of human resources (local manpower) should be considered a significant achievement within the general project goals. Internal staff training also has been continued throughout the four years.

The administration of FESSC has been committed to this project from its inception, and one quantifiable indicator is the funding that FESSC has
Figures 12 and 13
FLOOD DAMAGE AT TUBARAO, BRAZIL, 1974
Table 21
CDB-PUBLICATIONS ACQUIRED
(Program Years I-IV)

<table>
<thead>
<tr>
<th>Type of Publication</th>
<th>1974-75</th>
<th>1975-76</th>
<th>1976-77</th>
<th>1977-78</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periodicals</td>
<td>120</td>
<td>477</td>
<td>863</td>
<td>1,187</td>
</tr>
<tr>
<td>Annuals</td>
<td>-</td>
<td>9</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>Articles</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Catalogs</td>
<td>-</td>
<td>33</td>
<td>81</td>
<td>44</td>
</tr>
<tr>
<td>Books</td>
<td>121</td>
<td>57</td>
<td>107</td>
<td>285</td>
</tr>
<tr>
<td>Manuals</td>
<td>-</td>
<td>2</td>
<td>9</td>
<td>38</td>
</tr>
<tr>
<td>Maps</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>Reports</td>
<td>-</td>
<td>15</td>
<td>22</td>
<td>39</td>
</tr>
<tr>
<td>Profiles</td>
<td>-</td>
<td>1</td>
<td>74</td>
<td>-</td>
</tr>
<tr>
<td>Monographs</td>
<td>-</td>
<td>3</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Journals</td>
<td>-</td>
<td>5</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Censuses</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Calendar</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Studies</td>
<td>-</td>
<td>-</td>
<td>88</td>
<td>67</td>
</tr>
<tr>
<td>Booklets</td>
<td>-</td>
<td>-</td>
<td>88</td>
<td>41</td>
</tr>
<tr>
<td>Pamphlets</td>
<td>-</td>
<td>-</td>
<td>53</td>
<td>44</td>
</tr>
<tr>
<td>Newspaper Clippings*</td>
<td>-</td>
<td>-</td>
<td>1,475*</td>
<td>1,931*</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>-</td>
<td>48</td>
<td>132</td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>606</td>
<td>1,471</td>
<td>1,972</td>
</tr>
</tbody>
</table>

*Note: Newspaper clippings not shown in total.
Figure 14
GROWTH OF ACQUISITIONS
BASIC DATA CENTER-FESSC

Units Acquired

2,000

1,500

1,000

500

Table 22
SUMMARY OF PUBLICATIONS
BY FESSC, 1974-1978

<table>
<thead>
<tr>
<th>General Classification</th>
<th>1974-75</th>
<th>1975-76</th>
<th>1976-77</th>
<th>1977-78</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility Studies</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>Manufacturing Opportunity Studies</td>
<td>15</td>
<td>14</td>
<td>24</td>
<td>13</td>
<td>66</td>
</tr>
<tr>
<td>Case Studies</td>
<td>-</td>
<td>-</td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Management Guidelines</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Industrial Studies</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Other Studies</td>
<td>-</td>
<td>10</td>
<td>5</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>28</td>
<td>41</td>
<td>27</td>
<td>115</td>
</tr>
</tbody>
</table>

provided to match or complement the AID grant. Figure 15 graphically illustrates the favorable relationship between the funds invested in the project by AID and those generated by FESSC either internally or from other national sources (federal government, state government, national agencies, banks, and others). In addition, during the past year, FESSC obtained a 26-million-cruzeiro grant (about $1.8 million) to establish the Technology Center on the FESSC campus. This 4,000-square meter center will house the Adaptive Technology Center, created under this project, which will be responsible for the review and evaluation of existing foreign technology, as well as its adaptation for use by local small-scale industries. Figure 16 shows the initiation of construction of the center in July 1977.

University of Ife (1975-1977)

This project was initiated out of phase and was first funded in late June 1975. Originally it was planned to run through January 9, 1979, but instead was terminated at the end of June 1977.

Some accomplishments were achieved during Year I of this project, as reported in the Year I end-of-the-year report for Project B-455, published by the Georgia Institute of Technology. Unfortunately, the grantee did not issue the corresponding progress reports (quarterly) for Year II and to date has failed to submit a final report for the year ending in June 1977.
Figure 15
FUNDACAO EDUCACIONAL DO SUL DE SANTA CATARINA
GRANT AND PROJECT FUNDS
YEARS I-IV

<table>
<thead>
<tr>
<th>Year</th>
<th>AID Funds</th>
<th>Counterpart Institution Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974-1975</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>1975-1976</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>1976-1977</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>1977-1978</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Four Year Total</td>
<td>400,000</td>
<td>400,000</td>
</tr>
</tbody>
</table>
During the brief life of this project, the grantee reported having provided 53 small-scale industries with technical assistance. They were able to establish an industrial extension service and during Year I opened two field stations—one each at Ile-Ife and Ado Ekiti. Two additional field stations were planned for Year II, but there has been no official report on them.

The UI staff completed and published 16 studies on various aspects of small-scale industry development in Nigeria and presented two seminars—one for government officials occupying small-industry positions in all of the states of the federation and the other for about 50 small-scale industrialists interested in the problems of small industries in Nigeria.

The project generally got off to a good start, and during Year I the UI reported contributing substantial funding to the project, as shown in Figure 17. At the start of Year II, the administration of UI was changed; the new administration apparently lost interest in this project or had other priorities and project activities starting slowing down, coming finally to a halt by March 1977. The grant, therefore, was not renewed by the sponsor, at the recommendation of the OIP administration.
Figure 17

UNIVERSITY OF IFE
GRANT AND PROJECT FUNDS
YEARS I-II

<table>
<thead>
<tr>
<th></th>
<th>1975-1976</th>
<th>1976-1977*</th>
<th>Two Year Total*</th>
</tr>
</thead>
<tbody>
<tr>
<td>AID Funds</td>
<td>50,000</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Counterpart Institution Funds</td>
<td>250,000</td>
<td>250,000</td>
<td></td>
</tr>
</tbody>
</table>

*Data not available on counterpart contribution for 1976-1977.
University of the Philippines (1976-1978)

Since this project has been in existence only two years, it is too soon for many accomplishments to have accrued. Nevertheless, the project is showing good results.

Over the past two years, the extension service was designed, created, established, and became operational. The field office in Tacloban City has five staff members. They have been responsible for serving 14 companies during Year I and 22 during Year II for a total of 36 technical assistance cases. During the second year, 361 inquiries were serviced out of the Tacloban office, but only 22 developed into technical assistance cases. The UP/ISSI staff is serving a difficult geographical area which covers Northern Leyte, Southern Leyte, Western Samar, Northern Samar, Eastern Samar, and the sub-province of Biliran.

In the first year of this project, UP/ISSI was able to determine from the 14 companies serviced that seven new jobs had been created. The second year, they report generating 47 additional jobs, for a total of 54 new jobs over a two-year period. Table 23 presents this information.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Companies</th>
<th>Start</th>
<th>Finish</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-77</td>
<td>14</td>
<td>63</td>
<td>70</td>
<td>+7</td>
</tr>
<tr>
<td>1977-78</td>
<td>22</td>
<td>151</td>
<td>198</td>
<td>+47</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>+54</td>
</tr>
</tbody>
</table>

Interesting accomplishments also have resulted in the field of appropriate technology. In Year I, the UP/ISSI staff designed and developed a mechanical feed mixer fabricated out of a 55-gallon oil drum. This feed mixer was field tested and is presently in use by a local swine raiser. In Year II, the staff designed a wooden cart, to be used by a soft-drink box manufacturer, to carry...
raw materials and waste materials to and from the workplace of a machine operator.

Also in the field of appropriate technology, the UP/ISSI staff designed a simple 3-foot, 8-inch wood lathe powered by a 1-1/2 HP electric motor for a local furniture manufacturer. The lathe cost about $100.00 to build (without motor) and is being considered by other furniture manufacturers in the area. Figure 18 shows a picture of the lathe in operation.

The area of human resources has also been of a high priority to the counterpart staff and some achievements can be identified. In Year I, research was conducted to determine the need for entrepreneur training. During Year II, a seminar on entrepreneurship development was offered at Maasin and attended by 16 persons. Of these 16 participants, four have either started a small-scale industry or expanded one already in existence. These results are considered very high for a group that small. Furthermore, another seminar was held for 23 faculty members representing the university and colleges of the region to establish a syllabus of courses to be offered to
first- and second-year students of business administration. These courses all have to do with entrepreneurship development.

In the area of industrial training, a course was presented in cooperation with the TIEIA, and 136 employees of ironworks and engineering industries participated. Staff training also was implemented; two additional persons were trained this year, bringing the total up to six persons trained at OIP or the East-West Center, Hawaii.

UP has shown interest in this project and this year invested some of its internal funds to assist in supporting the project, as shown in Figure 19.

University of Science and Technology (1977-1978)

The project is now entering the second half of its first year and the end-of-the-year report will not be available until July 1978; consequently, it is very difficult at this time to highlight any accomplishments.

As was indicated earlier, one member of TCC has been trained at the OIP headquarters in Atlanta. The provision of technical assistance to local small-scale industries has been initiated and several research subprojects are being implemented. Figure 20 present graphically the counterpart funding for this new project.

Under a separately funded AID project, work is being conducted to demonstrate pyrolysis as a feasible and economic alternative energy source for Ghana. The first pyrolysis unit has been constructed and is presently being tested. Figure 21 is the process flow chart diagram for the unit now being tested in Ghana.

Preliminary Conclusions

At the end of the fourth year of this program (Project A-1600), OIP has been able to successfully establish three counterpart projects with units overseas, has had to terminate one counterpart project, and has just initiated a fifth project in Ghana. The three counterparts with two or more years of participation appear to be fully dedicated to the basic concept of generating and expanding small-scale industries in their respective areas of influence. These three successful counterparts are now capable of operating with minimal technical support from OIP and have proven their ability to implement action-oriented, pragmatic industrial extension programs. The accomplishments
Figure 19

UNIVERSITY OF THE PHILIPPINES
GRANT AND PROJECT FUNDS
YEARS I-II

<table>
<thead>
<tr>
<th>Year</th>
<th>AID Funds</th>
<th>Counterpart Institution Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-1977</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>1977-1978</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Total</td>
<td>100,000</td>
<td>100,000</td>
</tr>
</tbody>
</table>
Dollars

400,000

350,000

300,000

250,000

200,000

150,000

100,000

50,000

1977-1978*

AID Funds

Counterpart Institution Funds


Figure 20
UNIVERSITY OF SCIENCE AND TECHNOLOGY
GRANT AND PROJECT FUNDS
YEAR I (INCOMPLETE)
Figure 21
PYROLYSIS PROCESS FLOW DIAGRAM

[Diagram showing the process flow of pyrolysis with various labeled components such as air compressor, reactor, condenser, storage, and dryer.]
highlighted in this section speak for themselves. Each of the counterparts adapted the methodology offered by OIP and, assisted by the technical staff from OIP, implemented it in what many consider to be examples of the successful application of appropriate technology or technology transfer.

Between the three counterparts with more than two years into the program, over 2,341 new jobs have been generated in rural areas of the developing world. These institutions now have trained staff members who are capable, to varying degrees, of (a) conducting appropriate research, (b) transferring technology, (c) managing technology, (d) adapting existing techniques, (e) developing methodology as well as designing, implementing, and managing industrial programs and industrial training programs.

The greatest single accomplishment of this program may be that these counterparts are developing their own methods and techniques in such areas as research, technology transfer, and appropriate technology. They are establishing their own technological expertise and starting to break away from the process of importing technology.

This program appears to be intrinsically a very valuable one: over the years the practitioners have determined that the central cause of technology transfer failure in most LDCs is the lack of linkages between the existing "science and technology" institutions of the nation and local industry. As a result, the national industrial process remains weak and the import of foreign technology, with the corresponding dependency, remains very high. Furthermore, the absence of local technological expertise inhibits the LDC from participating in ventures advanced by foreign firms and often simply creates rules and restrictions which may be damaging with regard to foreign technology imports. Through this program, it is being demonstrated that it is possible for an LDC to participate with a developed country in the development of its indigenous technological capability and that this can be done under a mutual agreement between two peer group institutions. It is possible that by the end of the program there will exist an illustrative mechanism applicable on a much wider basis to science and technology policies in less-developed countries and their developed counterparts.

In summary, the program is very worthwhile, in both engineering and pragmatic technical assistance. It has proven itself and is starting to produce quantifiable results in three different areas of the world. If
nothing else, this program is providing on-site technical assistance to small-scale industries in rural areas of LDCs, something that previously was unavailable to them. This service, at the least, will have a beneficial economic impact on the rural poor of these areas.

It is, therefore, the conclusion of the Project Director and the Counterpart Project Directors that results attained to date surpass those initially conceived by the program and that this program should be continued for the balance of the grant.
SMALL–SCALE INDUSTRY GRANT YEAR V

STIMULATING THE GROWTH OF SMALL–SCALE INDUSTRY

GEORGIA INSTITUTE OF TECHNOLOGY

Engineering Experiment Station
Atlanta, Georgia 30332

1979
FINAL REPORT
YEAR V

STIMULATING THE GROWTH OF SMALL-SCALE INDUSTRY

Prepared for
U.S. Agency for International Development

by
Nelson C. Wall

Office of International Programs
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY
January 1979
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INTRODUCTION

On January 23, 1974, the Agency for International Development (AID) funded for the first time Contract No. AID/ta-c-1062, through which the then Economic Development Laboratory (now Office of International Programs) of the Engineering Experiment Station at the Georgia Institute of Technology was assigned the overall responsibility of implementing a five-year program of work in the area of stimulating growth of small-scale industry by providing grants and technical assistance to counterpart institutions. The administrative portion and project direction of this AID contract were assigned internally to the Office of International Programs (OIP) and given the project number A-1600 by the Office of Contract Administration of the Georgia Institute of Technology.

Second, third, fourth, and fifth consecutive years were funded by the same sponsor. This is the final report for Year V as well as the end-of-project report. This fifth program year was implemented in four different geographical regions of the world, but over the five years implementation was carried out in five different nations. In Year I only two counterparts were funded: Soong Jun University, Seoul, Korea (Project B-426), and the Fundacao Educacional do Sul de Santa Catarina, Tubarao, Brazil (Project B-427). During Year II, the third counterpart institution was funded, the University of Ife, Ile-Ife, Nigeria (Project B-455), and in Year III the fourth counterpart institution, the University of the Philippines, Institute for Small-Scale Industries, Manila, Philippines (Project B-463) was added. In Years IV and V, the University of Science and Technology, Technology Consultancy Centre, Kumasi, Ghana (Project B-492), replaced the University of Ife, which was dropped from the programs.

As established by contract guidelines, the following criteria were used in selecting each of the above counterparts, as specified by the sponsor:

1. Suitability of the national macroeconomic framework for local business conditions.
2. Existence of practicing or potential entrepreneurs.
3. Community concern over unemployment.
4. Existence of potential market for additional products.
5. Linkages (current or potential) with educational, financial, and business communities.
6. Quality of the staff.
7. Institution's potential for utilizing the grant effectively.
8. Potential multiplier effects.
9. Host government's commitments.

One of the basic provisions of the AID contract was that linkages or counterpart relationships with organizations in developing countries would be established and only four of these counterpart institutions would be funded under the present contract. After an extensive survey of 13 countries (Bolivia, Brazil, Colombia, Ecuador, Ghana, Ivory Coast, Indonesia, Kenya, Korea, Nigeria, Paraguay, Philippines and Thailand) was conducted in 1973 the first two institutions were selected for this project. Approximately 30 potential counterpart institutions were reviewed by the OIP staff and the sponsor.

Each of the selected institutions was asked to prepare and submit to OIP its project proposal. These were reviewed with the sponsor and later were funded by separate $45,000 annual grants as provided by the base project, A-1600.

The terms of the individual grants to the counterpart institutions permitted the grantee to utilize half of the grant funds for personnel, travel, materials and supplies, conferences, etc. The balance of the funds was to be used by the grantee to contract for training and consultation services from U. S. technical assistance-type organizations.

The Office of International Programs, through the Georgia Institute of Technology, subsequently contracted with all five grantees to provide training, consultation, technical support, information and data, as well as audiovisual documentation of the projects.

At the end of the four past program years, each individual project has been reported on separately. The sponsor has been provided with a complete set of the audiovisual documentaries for the individual counterpart institutions.
The sponsor also has been provided with an ample number of copies of the yearly reports. In the past five years, two in-depth project reviews have been conducted by the sponsor, as well as several progress reviews. As needed, minor adjustments to the project plan have been recommended and implemented. The total project came to its programmed end on January 9, 1979.

1/ For full details, refer to the respective end-of-the-year reports entitled Final Report--Small-Scale Industry Grant for each year and each counterpart named in this document, by Nelson C. Wall, published by the Georgia Institute of Technology, Atlanta, Georgia, January 1975, 1976, 1977, and 1978.
PART I

PROGRAM YEAR V
SUMMARY OF PROGRAM YEAR V

Other sections of this final report present in detail the activities and results attained by each of the counterpart institutions during this past year of the program. This section summarizes and highlights some of the results obtained in the past 12 months.

Project B-426--Soong Jun University (SJU), Seoul, Korea

1. Thirty companies were provided with technical-management assistance during this year--25 in Seoul and five in the Taejon area.

2. A survey of 27 companies, 12 in the Seoul area and 15 in the Taejon area, reported a total gain of 119 new jobs.

3. The research staff continued working on the development of a solar flat-plate collector which looks very promising.

4. Several appropriate technology devices have been developed or are being developed, such as a semi-portable methane gas generator, a device to scare birds (protect crops), and a device to assist in the manufacture of gut strings for tennis rackets.

5. SJU established working relationships with several Korean national institutions. The staff at SJU has received national recognition for its work with small-scale industries in that country. Several members of the staff are serving as consultants to national organizations.

6. Several seminars and training courses were presented to groups of small business managers, students, and government employees.

7. Fourteen publications were completed and published during this year.

8. Other donors also provided several grants to SJU to assist them in their research program.

9. The fifth annual audiovisual documentation was completed with coverage of both old and new technical assistance cases.
Project B-427--Fundacao Educacional do Sul de Santa Catarina (FESSC), Tubarao, Brazil

1. The Basic Data Center (CDB) increased its holdings by 2,152 units during the year, not including some 985 newspaper clippings. Requests for information services reached an all-time high of 707 during the year.

2. Technical-management assistance was provided to 61 companies; of these, 35 requests developed into technical-management assistance cases. The remaining 26 requests from local enterprises received consultation, information, or limited assistance.

3. Twelve of the serviced companies were monitored during the year and reported having increased their employment by a total of 2,721 new jobs.

4. The 3,200-square meter Technology Center was completed and is now in operation. The Center represents a total investment in excess of $1.2 million, with all funding provided by either federal or state sources.

5. Training of local human resources was continued, with 42 training programs presented and more than 1,600 persons completing them.

6. Members of the staff also received additional training. This year resulted in 107 registrations for a total of 26 different training programs.

7. The counterpart staff completed two feasibility studies, 14 new manufacturing opportunity studies, three management guidelines, and two case studies.

8. During the year the FESSC staff reports having presented five conferences, seminars or lectures, and the OIP staff presented six additional lectures.

9. The fifth annual audiovisual documentation was taped during the year.

Project B-463--University of the Philippines, Institute for Small-Scale Industries (UP/ISSI), Manila, Philippines

1. The staff of the UP/ISSI Pilot Extension Office in Tacloban, Leyte, provided technical-management assistance to 20 new companies in that area during the year.
2. A selected group of companies (six firms) which had received technical-management assistance during the year reported having increased their labor force by 20 new employees.

3. The Pilot Extension Office staff also assisted in establishing five new enterprises in 1978.

4. UP/ISSI implemented training programs with nine different government agencies during the reporting year, and 20 rural workers also completed a training program in handicraft skills.

5. Two members of the Pilot Extension Office staff participated in special training programs, one with Technonet Asia, the other at OIP headquarters in Atlanta.

6. Three new appropriate technology devices were conceived and produced by the counterpart staff: a wood lathe machine spindle, a steel weaving frame, and a solar dryer.

7. As part of its activity for this year, the UP/ISSI staff published nine feasibility studies, eight case studies, six industrial surveys, and eight project proposals.

8. The third annual audiovisual documentation also was completed during the 1978-79 year.

Project B-492--University of Science and Technology, Technology Consultancy Centre (UST/TCC), Kumasi, Ghana

1. The steel bolts and nuts manufacturing unit continued to operate at a profit level, and during the year additional equipment became available, thus allowing a local entrepreneur to set up a small fabrication unit off the campus.

2. The broadloom weaving unit also continued its operation, and the new technology is slowly being accepted by local craftsmen.

3. A hand-operated screw press was designed and constructed for the extraction of palm oil. Several presses have been fabricated and sold to local farmers.
4. Research continued to identify local plants whose seeds can produce oil suitable for soapmaking. A five-acre pilot plantation was begun by the staff and is now planted in castor beans and physic nuts.

5. Designs were completed during the year for a small-scale sugar pilot plant. The TCC staff plans to build the pilot plant during the following year.

6. The Craft Tourist Center at Wonoo was completed and will begin operation early in 1979.

7. An appropriate technology brass furnace was designed and constructed and is currently being tested. A rubber plantation was reactivated and an appropriate technology device to press rubber sheets was put into operation. An appropriate technology lemongrass distillery also was fabricated during the year.

8. Under a separately funded project, a prototype pyrolysis unit was developed to be used to operate a brick kiln.

9. The second audiovisual documentary was completed during the year.
Background

The Engineering Experiment Station (EES) at the Georgia Institute of Technology (GIT), a nonprofit organization, was authorized by an Act of the Georgia General Assembly in 1919 and was activated in 1934. EES was re-commissioned by the Assembly in 1960 "to aid in the promotion of scientific, engineering, and industrial research. . . to advance science, technology and education, to encourage further industrial and economic development, provide technical advice and assistance to business and industry . . . to provide an industrial extension service to meet the technical information and other needs of industry and local development groups. . . ."

The EES broad program of industrial and economic development research, service, information, and training covers the following major fields of activity: area development, community development, market analysis, industrial economics, management and technical assistance to industry, technical information services and technology transfer, manpower resources, basic data collection and dissemination, industrial and economic development training, and international development services. Special studies relating to natural resources, plant location, industrial land use, and industrial or rural development program planning also are conducted.

In the spring of 1964, EES became interested in the possibility of establishing an international program as a natural extension of its development work in process and that previously carried out in the state of Georgia. Further investigation revealed that at the time there were few, if any, universities in the country actively engaged in the training of foreign students in the basic principles and methodologies of industrial development.

Having recognized the need for and potential of a sound program of economic-industrial development for the emerging nations, EES added to its professional staff bilingual personnel with extensive industrial experience in both Latin America and the United States. This group evolved and began to draw upon experience gained by EES during its earlier years. In 1972, after a series of successful AID-sponsored projects in Latin America, the Georgia Institute of Technology was awarded an AID 21l(d) grant.
It was under this grant that the then International Programs Division (now the Office of International Programs) identified the need for stimulating the growth of small-scale industries in less-developed countries (LDCs). In an attempt to respond to this identified need, the International Programs Division prepared a proposal under the title, "Stimulating Growth of Small-Scale Industry," which was submitted to AID for consideration on October 15, 1973. Early the following year (January 23, 1974), the proposal was accepted and funded by AID.

Prior to the funding of this grant, the OIP staff had identified the general problems associated with the expansion and diversification of small-scale industry, as well as the creation of new industries. The following general problems had been identified:

1. Lack of a systems analysis approach to providing research, services, and information to industry.
2. Insufficient funding to expand industrial assistance activities.
3. Continuing need for training of more organizational staff personnel.
4. Lack of knowledge of pragmatic methodologies.
5. A deficient information base related to technical and management problems of small-scale industries.

The Office of International Programs suggested a program which would attempt to cope with these problem areas. Some of the basic elements proposed to the sponsor were:

1. An organizational focus with clearly defined aims.
2. A well-trained and motivated staff.
3. An information base.
4. A technical assistance "delivery system."
5. A pragmatic approach (field-oriented) to the provision of technical and management assistance.
When this proposal program was funded by AID, Project A-1600 was established, and $45,000 grants then were made to each of the participating counterpart institutions. Mr. Nelson C. Wall, Associate Director of OIP, was named Project Director of A-1600.

As indicated earlier, the terms of the grants to the counterpart institutions permitted the grantee to allocate half of the grant funds for personnel, travel, materials and supplies, conferences, etc. The remaining half of the grant funds was to be used by the grantee to obtain training and consultation services from qualified organizations in the U.S.A. All the counterpart institutions contracted with OIP for these services.

The counterpart institutions funded for Year V of the project are briefly described below:

Soong Jun University

Soong Jun University (SJU) was created in September 1970 when Soong Sil College united with Taejon College to form a new cooperative venture in the field of Christian education. Soong Sil College, in turn, had been established in Pyeng Yong (North Korea) in 1897; it was reopened in Seoul in May 1954 by the Korea Mission of the Presbyterian Church after being closed in 1938 during the Japanese occupation. At present, Soong Jun University has an enrollment of some 2,500 undergraduate students and 80 graduate students. The engineering program comprises some 800 students.

The main campus is located in Seoul near the large industrial area of Yong-Deung-Po, with a population well over 1.5 million inhabitants. The second campus at Taejon is near a smaller industrial area with a population of more than 500,000. The government of Korea presently is developing a new "science town" adjacent to the Taejon campus.

To better serve the needs of the nation, and in order to bring technology to the point of practical application, the SJU administration decided in 1973 to form, on each campus, an industrial development assistance program to concentrate on the less-developed regions and the industrial areas in those locations near the two campuses. In this manner, the Integrated Development Center (IDC) was established at Seoul and the Regional Development Institute (RDI) at Taejon.
The operating heads, also full-time faculty members on the campuses, are Dr. Yoon Bae Ouh at Seoul and Dr. Seyeul Kim at Taejon.

The criteria used by both IDC and RDI for the selection of the assistance areas were the following:

- Underdeveloped
- Low income average
- Underindustrialized
- High unemployment

The areas near the two campuses which best fit these criteria were Yeong-Deung-Po and Kwanak, south of Seoul, and Yun Kee Kun and Tae Duck Kun, surrounding and north of the city of Taejon. (See Map 1.) The Integrated Development Center at Seoul was assigned responsibility for all program activities and, for the past five years, has served as the counterpart unit to OIP at the Georgia Institute of Technology. Since the start of this program in 1974, Dr. Yoon Bae Ouh has served as counterpart Project Director.

Fundacao Educacional do Sul de Santa Catarina

The Fundacao Educacional do Sul de Santa Catarina (FESSC) is a well-respected, nonprofit, autonomous institution established by the Brazilian Civil Code and national legislation under Decree Laws 200 and 900. FESSC was established by Municipal Law No. 443/67 of October 18, 1967, and its bylaws define the following objectives:

1. Create, integrate, organize, and maintain schools of higher and medium level professional quality, as established by the needs of the labor market of the region, state, and nation.

2. Carry out course programs, training, and specialization for graduates and special courses for post-graduates.

3. Promote study and research in relation to the economic development and social development of the region and state by themselves, or with the assistance, or in cooperation with private and public entities.

4. Promote conferences, debates, and seminars as a dissemination of studies related to economic problems in general, or specifically of the region of South Santa Catarina.
5. Adopt, as needed, the necessary organization to implement the future University of South Santa Catarina.

The Council of Curators is made up of representatives of the entities which created and support the organization. The Executive Secretary is the representative of FESSC; at present, he is the President of the Executive Directorate of FESSC, Mr. Silvestre Heerdt.

The Executive Directorate of FESSC is composed of its President (the Executive Secretary of the Council of Curators) and the Directors of the Department of Higher Education, the Department of Secondary Education, and the Department of Research and Development. There is also an Educational and Technical Advisory Council to the Directorate.

The support organization to the administration includes a Secretary General, Associate Directors, Administrative Assistant, and assistants in teaching and planning.

The Research and Development Department has a center or institute to provide technical assistance, research, planning, and information oriented to local development and regional development of private enterprises, communities, municipalities, and other public sectors, as well as the private and civic community.

The campus at Tubarao started with the old Colegio Dehon, a 7,000-square meter building purchased in 1972. The new campus (under construction) covers a land area of 161,000 square meters. At present, enrollment is well over 3,000 students, of whom more than 1,000 are in higher education, 1,500 in high school, and the balance in grade school.

In 1974, when the project began, the Research and Development Department was assigned the responsibility for the program and has served as the counterpart unit to OIP. The Director of that department, Eco. Jose Muller, has been the counterpart Project Director for the past five years.

The area selected by FESSC for this program covers 9,409 square kilometers, encompassing 32 municipalities forming two micro-regions called AMUREL and AMSESC, with a population of over 650,000 inhabitants by the end of 1978. Map 2 depicts the political divisions of the project area.
University of the Philippines

The University of the Philippines' Institute for Small-Scale Industries (UP/ISSI) is a Philippine national agency and an integral part of the University of the Philippines System. Established in 1966, UP/ISSI is charged with promotion of the development of the Philippine small-industry sector, and its activities are directed to research, training, consultancy, entrepreneurial development, management and technical data development and dissemination, and extension services.

UP/ISSI is particularly concerned with the social advancement of the Philippine rural areas through appropriate industrial development. The organization maintains continuing and active professional linkages with international development organizations.

In August 1975, UP/ISSI decided to widen its professional capacity, particularly the intensification of its programs for direct rural development. This came about in response to government executive directives to governmental agencies to "intensify efforts for the establishment of appropriate industries in regions outside the Greater Manila area."

This counterpart entered the program in 1976. Since then, the development of further Government of the Philippines support to permit UP/ISSI to widen and direct its capacities to rural objectives has been abetted by this grant and by the technical cooperation provided by OIP.

At the start of the program, UP/ISSI designated Mr. Paterno V. Viloria, Director of ISSI, as counterpart Project Director, and he has served in that position to date. In 1976 it was decided that the target area of assistance would be the whole of Region VIII, comprising Leyte, Southern Leyte, Eastern Samar, and Northern Samar (see Map 3), with Tacloban City as headquarters. The total area of this region is 21,431.7 square kilometers, and its population in 1975 was 2,585,797 persons.

University of Science and Technology

The University of Science and Technology is located at Kumasi, in the central part of Ghana, about 200 kilometers from the capital city of Accra. The Technology Consultancy Centre (UST/TCC) was established in January 1972.
Map 3
SMALL INDUSTRY STUDY AREA,
UP/ISSI -- EASTERN VISAYAS

SAMAR

TACLOBAN CITY

LEYTE

PHILIPPINES

-19-
TCC was created to act as an agency for the stimulation of grass-roots development by means of "intermediate" or "appropriate" technology. It seeks to upgrade existing craft industries such as textiles, pottery, and woodworking, by the introduction of new products and improved manufacturing techniques. TCC also endeavors to generate new small-scale industries based on products developed by the Academic Faculty of the University and utilizing, insofar as possible, locally produced raw materials.

Between 1972 and 1976, TCC established a number of production units which have yielded useful commercial and industrial experiences under local conditions. These production units, making steel bolts and nuts, bar soap, and textile products, have been effective in training a number of craftsmen. Aided by grants from overseas in foreign exchange, TCC has imported over the years the tools and equipment for the production units. The University then uses its influence to secure small consignments of raw materials. In this manner, the manufacturing units are able to operate.

The functions of TCC are:

1. To offer consultancy service of a conventional, sponsored nature to government agencies, public corporations, and large industries.

2. To stimulate small-scale industry through free or low-cost consulting services, the establishment of production units by TCC, and the provision of manufacturing equipment, personnel training, and other appropriate means.

3. To collaborate with the faculties in the encouragement of research and development of an applied and practical nature aimed at solving problems of immediate importance to native industry.

On May 24, 1977, the sponsor advised OIP that it concurred with OIP's recommendation that the Nigerian Small Industry Grant not be extended and that the grant instead be initiated with TCC. The University of Science and Technology then entered the program, and Dr. John W. Powell, Director of TCC, was appointed as counterpart Project Director.

Objectives

At the initiation of this program, the continuing objectives were clearly defined, and they have been reviewed by the sponsor at each of two comprehensive reviews and several progress reviews since January 10, 1974.
The objectives are threefold:

1. To encourage selected developing country organizations to focus on employment generation through programs which accelerate the expansion of existing industry and the creation of new small industries.

2. To demonstrate and document the impact of alternative approaches to the stimulation of industry.

3. To create in the appropriate governmental, industrial, and financial sectors of small industry an awareness of potentials and ways to maximize these potentials.

To further ensure compliance with these program objectives, the Project Director, OIP, established two main areas of activities for his staff:

1. Training of selected counterpart staff, both on site and in the U.S.A.

2. Provision of on-site consulting services to the different programs implemented by the counterpart institutions.

It was also established that the OIP project staff would assist the counterpart teams in providing managerial, engineering, scientific, and technical assistance to selected small and medium-sized industries in the participating host countries. The established objectives for Year V were met during this reporting year.

Total Project Goals of the AID/ta-c-1062 Contract

The project goals were delineated by the Agency for International Development (AID) at the start of the Small-Scale Industry Grant on January 23, 1974. The established goals to be achieved over a five-year period are as follows:

The general objective of this contract is to generate employment in developing countries, particularly outside of the metropolitan centers, by: (a) strengthening the capability of a selected institution in each country to provide effective technical assistance to local small industry, (b) demonstrating and documenting the impact of alternative approaches to technical assistance to small industry, and (c) infusing the governmental, industrial and financial sectors of the local community selected to provide employment with the understanding of the techniques of generating jobs. The above objectives will be carried out through the use of grants to selected Lesser Developed Country (LDC) organizations.
Once the total project goals are attained, the sponsor anticipates the following outputs:

1. Increased job opportunity in four countries.
2. Increased viability of indigenously owned enterprises.
3. Improved capability of four LDC institutions to serve small industry.
4. Tested methodologies for strengthening LDC industries.
5. Evaluation report on successes and failures in assisting small industry.

The total project goals have been met over the past five years, plus several additional accomplishments during this year and the life of the project, all of which are presented in further detail in the balance of this final report.

Programs of Work

Under Project A-1600, the role defined for the Office of International Programs was that of administering the program, providing guidance to the participating institutions in designing and developing their own projects, providing advice and counsel as required, suggesting alternative options for their consideration, monitoring the implementation, and in general, providing the necessary leadership, all leading to the enhancement and assurance of positive results as established by the project goals.

For the past five years, the OIP Project Director has provided suggested programs for each of the participating counterpart institutions. These suggested programs of work were reviewed and modified by the counterpart Project Directors and their staffs in order to achieve their own goals and to meet established needs. In an attempt to create a basis for some degree of comparison, and to establish criteria applicable to all projects, the following guidelines were recommended to be incorporated in all counterpart projects, starting in Year I of the program.

1. Counterpart Organization Functional Activities
   a. Organization. The counterpart will administratively designate a unit to mount a program of research, service, training, and technical information for the small industry sector.
Staff personnel will design the program based on the organization's goals and motivations.

b. Facilities and Staff. The counterpart will provide adequate office, equipment, and other resources to the designated unit to permit its staff to function effectively. Staff personnel who have appropriate backgrounds and who, with appropriate training, can implement the program of assistance will be assigned to the unit.

c. Technology Transfer. An information collection will be established by the counterpart, where one does not already exist, to permit the staff to conduct research on industrial problems, needs, processes, and products, especially as they relate to small-scale industry, and to disseminate technical information.

d. Delivery System. The counterpart will design and implement a procedure to permit direct contact with small industries and entrepreneurs for the purpose of ascertaining their needs and problems and for the provision of staff assistance and research in the solution of problems, both management and technical in nature. This industrial extension activity will have as its aim the establishment of new industry and the expansion and diversification of existing industry.

e. Education and Training. The counterpart will design and deliver appropriate training programs related to small-scale industry. Educational programs related to industrialization will be encouraged.

2. Independent Continuing Activities. The counterpart will design, in cooperation with the OIP Project Director, a specific program of continuing activities which should include, but not be limited to, the following major subject areas:
a. Research Activities. For example, this could be in the areas of: (1) preparation of case histories; (2) approaches leading to employment generation; (3) analysis, evaluation, and development of new industrialization techniques (if appropriate), products, and processes. Other research activities also will be considered.

b. Industrial Extension Activities. This should be a pragmatic type of program related directly to serving the new and existing small-scale industries. Sample activities would be: (1) industrial problem-solving; (2) advice to and consultation with industry; (3) survey of small-scale industry problems and needs.

c. Training Activities. The counterpart institution should consider the possibility of providing on-site training to persons in industry. This training may be to management, supervisors, or employees, as needed. Some sample subjects to be considered are: (1) market analysis, (2) small industry operation, and (3) survey of small-scale industry problems and needs.

d. Educational Activities. This is an option, but if the counterpart is an educational institution, it is highly recommended.

e. Training and Consultation. This task will be the responsibility of the OIP staff. As needed, selected counterpart institution staff will receive appropriate training at OIP headquarters in Atlanta, Georgia. The training may take various forms as appropriate, including classroom work, on-the-job training, consulting and advisory services, plant tours, and other pertinent topics.

Using the established program guidelines, the individual counterpart institutions then developed their corresponding programs for this year. The individual programs are summarized as follows:
1. Technical/Managerial Assistance

a. Emphasis will continue to be placed on the mechanical engineering area, but expansion into other technical areas will proceed as begun in 1975 and carried forward in 1976 and 1977. During the latter year, assistance was provided in textile engineering, electrical engineering, chemical engineering, electronic engineering, and commercial design in both the Seoul and Taejon areas.

b. Managerial and industrial engineering assistance will continue to be expanded, with emphasis on quality control and general industrial management techniques.

c. During 1978-79, emphasis will continue to be placed more on adaptive technology and improvement of management practices in small-scale industries. During 1977-78, there has been an increasing demand on these areas from the small-scale industry sector.

2. Solar Energy and Small-Scale Industries. With continuing technical assistance from the Office of International Programs (OIP), SJU's engineering staff will seek to develop simple and inexpensive devices to utilize solar energy. These may be usable in small-scale industries or be suitable for production and sale by small firms. During 1977, work was begun by the Seoul campus engineers on a more efficient flat-plate solar energy collector which is being made of lighter weight, less expensive materials. Using published material furnished by OIP, SJU is developing this solar collector, which will be constructed of local materials, not relying on foreign-made materials. On the other hand, the Taejon campus staff developed and constructed a low-cost improved greenhouse for use by small farmers, which is being demonstrated to area residents.

As in 1977, SJU will continue to work with OIP and the Korea Institute of Science and Technology (KIST) in matters related to practical, marketable solar devices for production and use in Korea.

3. Appropriate Technology. The SJU staff has been engaged in the development of appropriate technology for several years.
During 1977 the Taejon campus staff has designed and tested two improved versions of the wheeled "cheegay." The latest model has been approved by the panel of users and a plant has been located, the management of which is willing to produce 500 units for sale next year. Application has been made for a Korean patent. Royalties from the sale of any units beyond the initial test run of 500 will be utilized by SJU for further work in appropriate technology. A traditional Korean scythe and a very dangerous cutting device already have been identified by SJU for improvement and production. On the other hand, at the Seoul campus SJU engineers have already developed a very simple device for utilizing wind power to pump water.

4. Organizational Linkages and Information Exchange. The joint SJU/OIP program, from its inception, has sought to facilitate linkages between various industries and governmental agencies interested in small-scale industries. During 1978-79, an information exchange between SJU and various agencies will be continued. Information useful to small-scale industry will be made available via SJU's Small-Scale Industry Information Center.

During 1977, SJU has begun to see the payoff from the groundwork laid during the previous years of the joint SJU/OIP program. Linkages have been established with the Korea Credit Guarantee Fund, the Korea Federation of Small Business, the Korea Ministry of Commerce and Industry, and the Korea Medium Industry Bank.

Discussions were in progress at year's end with representatives of the Korea Credit Guarantee Fund regarding substantial contractual work for SJU/OIP during 1978. As in past years, emphasis will be placed on the audiovisual material collection.

5. Training Programs. During 1977 SJU presented five seminars regarding various aspects of small business. One of these was presented to engineers, owners, and managers from member firms of the Korea Association of Communication Instrument Manufacturing Industry. A similar seminar had been conducted by SJU in 1976. Korean government and industry continue to be strongly interested in training in such fields as quality control, energy management, and production control. Such programs will be continued during 1978-79.
6. Educational Activities. 1977 was the third year of operation for SJU's new Industrial Engineering Department, which resulted from the joint SJU/OIP project.

As in 1977, it is planned that the following activities will be carried out:

a. Various training seminars for the faculty and students.
b. Assessment of the joint SJU/OIP program.
c. Development of written and audiovisual case histories.
d. U.S. training for faculty members.

7. General. During the last quarter of this final year, SJU together with an OIP staff representative will prepare an in-depth end-of-the-project report. This final report will present in detail the accomplishments and shortcomings of the total program (five years). A baseline study also will be prepared by the SJU staff during the year; it will be compared with the one published during Year I and appropriate conclusions will be drawn from this comparison.

B-427--Fundacao Educacional do Sul de Santa Catarina (FESSC)

1. Basic Data Center (CDB). In the past four years, the CDB more than doubled its holdings, but it is still developing. This important unit of the Department of Research and Development will be assisted in expanding its collection of information of social, economic, industrial, and technological origin. In the past year, this collection has been widely used by the staff in the day-to-day solving of the problems of the small-scale industries in the area. The collection also is open to the students and general public.

The systematic expansion of the existing center, within the specialty of providing information to small-scale industries, will continue to be of the highest priority during this proposed program year.

During Year V, emphasis will be given to the following areas of work within the CDB:
a. Collection, classification, and dissemination of pragmatic, up-to-date information on Brazilian and international material relevant to small-scale industries and appropriate technology.

b. Additional on-site consultation and assistance from the OIP senior staff as needed.

c. Implementation and expansion of the guidelines established during the Year I for the operation of the CDB.

d. Training of staff in audiovisual documentation.

2. Center for Management and Technical Assistance (CETEG). This is the strongest unit which has developed from this program over the past four years. For Year V, the following activities are planned:

   a. Continue to provide continuous technical assistance service to a total of 11 companies.
   b. Continue to provide discontinuous (as needed) technical assistance service to a total of 30 companies during the year.
   c. Conduct and complete two feasibility studies.
   d. Determine, select, and complete eight manufacturing opportunity studies.
   e. Continue the audiovisual case histories and documentation begun during Years I, II, III, and IV.
   f. Prepare two management guidelines for small-scale industries.
   g. Prepare a baseline study at the end of the year.
   h. Prepare two industrial case studies.

   The staff of OIP will provide support, assistance, and consultation to the CETEG staff in the above program activities.

3. Adaptive Technology Center (CATT). This growing center is in need of additional staff training. It is anticipated that during Year V a training program will be presented jointly with the OIP staff and assisted by the faculty at the Georgia Institute of Technology.
The OIP staff representatives on site will work closely with the CATT staff in developing guidelines, initiating activities, determining needs, identifying data requirements, and providing other assistance as necessary during the year.

4. Department for Permanent Education (DEP). As in the past years, the OIP staff on site will participate with FESSC staff in the presentation of short courses, lectures, and workshops. Three training programs are planned for on-site presentation during the project year. Dates will be established by the respective project directors for FESSC and OIP. Three lecture series also are planned for this year. The lectures and training programs will be presented at the same time that the OIP staff is on site at FESSC. During past years this activity was well received and programs were offered to the graduating classes of different disciplines.

5. General. During the last quarter of this final year, FESSC together with an OIP staff representative will prepare an in-depth end-of-the-project report. This final report will present in detail the accomplishments and shortcomings of the total program (five years). The baseline study which will be prepared this year shall be compared to the one published during Year I and appropriate conclusions will be drawn from this comparison.

B-463--University of the Philippines, Institute for Small-Scale Industries (UP/ISSI)

1. Extension Office - Tacloban City

The now-established Pilot Extension Office will continue to undertake the following services:

a. Extension Services
   - general information: handouts and reports
   - general management consultancy
   - direct plant assistance
   - project feasibility studies
   - industry and entrepreneurship promotion on the regional level
b. Research
   - provincial surveys
   - industry profiles/studies
   - technological studies
   - product research
c. Training
   - management and technical courses (short- and long-term)
   - seminars for selected industries
   - seminars on entrepreneurship

2. Industrial Extension - General

   Industrial extension will be continued as a major thrust. Strategies to be followed are as follows:

   a. The utilization of an industry-organization approach to industrial extension in order to provide a wider impact of assistance rendered.
   b. The introduction of appropriate technology to labor-intensive production processes.
   c. The continuation of entrepreneurship training.
   d. The preparation of project feasibility studies involving plant expansion or new projects which are labor intensive.
   e. The dissemination of information on technology.
   f. The selection of projects having high impact potential will be done using the following criteria:
      - appropriate technology applications 40%
      - employment and productivity levels 30%
      - resource-orientatedness 20%
      - capital/labor ratio 10%

      (Weight has been arbitrarily assigned, depending on perceived importance and impact of criteria.)

3. Industrial Training and Education

   To continue the training and education activities started the previous year, the following are to be implemented:
a. To continue to upgrade, through training/recruitment, the skill level and performance effectiveness of the UP/ISSI Pilot Extension Office (Redentor Dakanay to GIT).
b. To continue to follow up the trainees on the Entrepreneurship Training programs conducted in Maasin, Tacloban, and Catarman on a bimonthly basis.

4. Research

The following research activities will be considered as priorities:

a. To continue to develop the bandsaw design and belt-switching mechanism for San Juanico Industries, Inc.
b. To conduct a baseline study during the last half of the year to be compared with the published study done during Year I.

5. Linkages

In order to reinforce the linkages established in the past, these actions are recommended:

a. DSSD/NSDB/UPISSI Joint Project on Fermentative Food Processing and Food Preservation.
b. LSBDA/LDS/NACIDA/UPISSI Handicraft Project.
c. Survey of Small-Scale Industry and Pre-Investment Study of Leyte with UP College, Tacloban.
d. Introduction of EDP in business courses at the college level in Region VIII.

B-392--University of Science and Technology, Technology Consultancy Centre (UST/TCC)

1. Industrial Training and Education

a. To establish optimum objectives for TCC professional staff training to be subsequently provided in Atlanta by the Georgia Institute of Technology. It is anticipated that these training courses may include the following:
o Field office management for industrial extension services
o Industrial data gathering and dissemination for rural users
o Vegetable oil processing, soap making, and rubber processing

2. Technical Assistance

a. To better utilize scheduled visits by OIP staff members to TCC facilities in support of technical assistance transfer activities. The activities are to include:
   o General management consultancy
   o In-plant assistance
   o Feasibility analysis
   o Entrepreneurial promotion
   o Development of appropriate rural technology

3. Research

   To support, as indicated, related research activities of TCC through interaction with OIP staff and through continuing contact with the International Development Data Center (IDDC) at OIP. This support will be particularly directed to:
   a. Appropriate technology
   b. Alternative sources for scarce raw materials, such as palm oil for the production of soap
   c. Techniques for ferrous and nonferrous casting

4. Applied Research

   Under a separately funded budget, OIP and TCC will continue to develop a project to demonstrate pyrolysis as a feasible and economic alternative energy source for Ghana and possibly for other developing countries. The pyrolytic converter system, once developed, would be used to provide energy for a brick kiln.

   In the following section of this final report, each of the counterpart programs for Year V is described in detail and in Part II, a five-year summary is presented.
Use of Grant Funds

Each of the grantees participating in the Year V program was funded for a one-year period in the amount of $45,000. The following institutions participated:

Year V Funding

Soong Jun University
Fundacao Educacional do Sul de Santa Catarina
University of the Philippines
University of Science and Technology
(six months only, July 1978-January 1979)

Project B-426
Project B-427
Project B-463
Project B-492

In addition to the $45,000 grant, Soong Jun University received $4,974 from the terminated grant to the University of Ife (B-455), and the University of Science and Technology received an additional $7,600 from the same fund. Both these additional grants were authorized by the sponsor. Disbursements of all these funds are shown in Tables 1 through 4 for the corresponding counterpart institutions.

All of the four counterpart institutions described in this part of the report have shown commitments to the program by investing their own funds in their respective projects. For example, during Year V, SJU spent $50,000 (50.4% of the total); FESSC invested $59,900 (57.1% of the total); UP participated with $1,226 (2.7% of the total); and UST contributed $45,000 (59.9% of the total).

The first two counterparts mentioned have contributed heavily to the program over the past five years. A complete analysis of the disbursement and use of grant funds from 1974 to 1979 is presented in Part II of this report.
Table 1
DISBURSEMENT OF GRANT AND PROJECT FUNDS
SOONG JUN UNIVERSITY (B-426)
YEAR V
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Funds by Source</th>
<th>Project Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>SJU*</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
<td>16,987</td>
<td>29,000</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>1,300</td>
<td>3,000</td>
</tr>
<tr>
<td>Local</td>
<td>1,700</td>
<td>3,500</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Conferences/ Seminars</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>22,987</td>
<td>-</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>200</td>
</tr>
<tr>
<td>Technical Research and Support</td>
<td>1,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Overhead</td>
<td></td>
<td>9,000</td>
</tr>
<tr>
<td>Total</td>
<td>49,974&lt;sup&gt;1/&lt;/sup&gt;</td>
<td>50,700</td>
</tr>
</tbody>
</table>

Participation: AID 49.6%
SJU 50.4%

* Includes cost sharing from industry, university and foundations.

<sup>1/</sup> Year V includes $45,000 grant plus an additional $4,974 from B-455, as authorized by sponsor, for a total of $49,974.

Sources: OIP accounting and counterpart financial reports.
Table 2
DISBURSEMENT OF GRANT AND PROJECT FUNDS
FUNDACAO EDUCACIONAL DO SUL DE SANTA CATARINA (B-427)
YEAR V
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>AID</th>
<th>FESSC*</th>
<th>Project Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year V</td>
<td></td>
<td></td>
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<tr>
<td>Direct Salaries and Wages</td>
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<td>42,900</td>
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<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>6,000</td>
<td>-</td>
<td>6,000</td>
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<tr>
<td>Local</td>
<td>1,200</td>
<td>1,500</td>
<td>2,700</td>
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<tr>
<td>Materials and Supplies</td>
<td>3,600</td>
<td>-</td>
<td>3,600</td>
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<tr>
<td>Contract Services</td>
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</tr>
<tr>
<td>Local</td>
<td>-</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>GIT</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
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<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Consultants (Local)</td>
<td>-</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Overhead</td>
<td>-</td>
<td>3,500</td>
<td>3,500</td>
</tr>
<tr>
<td>Other (Publications)</td>
<td>-</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td>59,900</td>
<td>104,900</td>
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</table>

Participation: AID
FESSC

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>42.9%</td>
</tr>
<tr>
<td></td>
<td>57.1%</td>
</tr>
</tbody>
</table>

* Includes cost sharing from federal and state governments as well as industry.

Sources: OIP accounting and counterpart reports.
Table 3
DISBURSEMENT OF GRANT AND PROJECT FUNDS
UNIVERSITY OF THE PHILIPPINES (B-463)
YEAR II
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Funds by Source</th>
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</tr>
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<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UP*</td>
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<tr>
<td>Direct Salaries and Wages</td>
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<td>Travel</td>
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<td>International</td>
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<td>Local</td>
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<tr>
<td>Materials and Supplies</td>
<td>3,000</td>
<td>-</td>
</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>20,500</td>
<td>-</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
</tr>
<tr>
<td>Equipment</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td>1,226</td>
</tr>
</tbody>
</table>

Participation: AID 97.3%
                 UP 2.7%

* Includes cost sharing from other sources.

Sources: OIP accounting and counterpart financial reports.
<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Funds by Source</th>
<th>Project Total</th>
<th>Year II</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UST*</td>
<td></td>
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<tr>
<td>Direct Salaries and Wages</td>
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<td>45,000</td>
<td>45,000</td>
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<tr>
<td>Travel</td>
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<tr>
<td>International</td>
<td>4,760</td>
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<td>Local</td>
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<td>Materials and Supplies</td>
<td>2,400</td>
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<tr>
<td>Contract Services</td>
<td>14,050</td>
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<td>(GIT)</td>
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<tr>
<td>Audiovisual Documentation</td>
<td>1,000</td>
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<tr>
<td>Equipment</td>
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<tr>
<td>Total</td>
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<td>45,000</td>
<td>75,100</td>
</tr>
</tbody>
</table>

Participation:  
- AID: 40.1%  
- UST: 59.9%

<sup>1/</sup> Year II is from July 1, 1978, to January 9, 1979, and includes $22,500 plus $7,600 additional from B-455, as authorized by sponsor, for a total of $30,100.

Sources: Accounting and counterpart financial reports.

* Includes cost sharing from other sources.
GENERAL ACTIVITIES DURING PROGRAM YEAR V

In the Introduction section of this final report, it was indicated that Project A-1600 was established by the Georgia Institute of Technology as the base project and that all implementation would be carried out under the four companion projects: B-426, B-427, B-463, and B-492.

It was considered necessary by the Project Director to structure this final report in such a manner as to permit this section to highlight the relevant activities implemented under each companion project by the participating counterpart institutions. Year V was initiated on January 10, 1978, and came to its programmed end on January 9, 1979.

Soong Jun University (SJU)

This institution has been in the program since 1974, so this was its fifth year with the Small-Scale Industry Grant.

1. Technical/Management Assistance. The end-of-the-year report presented by the SJU project staff indicates that during this year 25 companies were provided with technical/management assistance by the Seoul campus staff, and another five companies were assisted by the Taejon campus staff. The firms assisted manufacture a wide variety of products, such as cotton fabric, racket gut, adhesives, capacitors, electric motors, radial drilling machines, golf balls, toys, and other products, to name a few.

The greater bulk of the assistance required was of a technical nature or related to production problems. Of five companies assisted in Taejon, three cases were completed by the end of the year; the other two were to be continued after the closing date of the program.

Figure 1, on the following page, presents one of the companies assisted by the program this year.

-39-
2. **Employment Generation.** As in other years, the project staff conducted a survey of companies which had received technical/management assistance in the past or present year to determine the increase or decrease in employment of these companies. In Year V, 15 companies were surveyed by the Seoul campus staff and an additional 12 by the Taejon campus staff. The survey reported a gain of 119 jobs during the year.
Tables 5 and 6, following, summarize the employment changes in the companies surveyed as reported by the SJU staff on each campus. In Part II of this report a five-year summary also is presented so as to provide an overall project recapitulation.

A significant result of previous work in this area was the granting in 1978 of several contracts by the Industry Development Office, Credit Assurance Fund, and the Small Business Association to expand further the provision of technical assistance and the employment generation activities of SJU.

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<thead>
<tr>
<th>Company Name</th>
<th>Start</th>
<th>End</th>
<th>Absolute</th>
<th>Percent</th>
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<tr>
<td>Dae Won Textile</td>
<td>60</td>
<td>72</td>
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<td>Samkang Textile</td>
<td>65</td>
<td>74</td>
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<td>Kukie Industrial</td>
<td>5</td>
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<td>Chungang Hwashin</td>
<td>12</td>
<td>15</td>
<td>3</td>
<td>25.00</td>
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<tr>
<td>Hyundai Oil-Press</td>
<td>50</td>
<td>52</td>
<td>2</td>
<td>4.00</td>
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<tr>
<td>Chilsung Polymer</td>
<td>10</td>
<td>12</td>
<td>2</td>
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<tr>
<td>Dae Yang Paper</td>
<td>52</td>
<td>55</td>
<td>3</td>
<td>5.77</td>
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<tr>
<td>Sejin Electronic</td>
<td>436</td>
<td>450</td>
<td>14</td>
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<tr>
<td>Daehan Marcon</td>
<td>151</td>
<td>163</td>
<td>12</td>
<td>7.94</td>
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<tr>
<td>Hankwan Industrial</td>
<td>110</td>
<td>121</td>
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<td>Samjin Electric</td>
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<td>Hungsuk Industrial</td>
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<td>36</td>
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<td>Dongbang Industrial</td>
<td>52</td>
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<td>Suho Industrial</td>
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<td>Samil Industrial</td>
<td>45</td>
<td>52</td>
<td>7</td>
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<tr>
<td><strong>Total</strong></td>
<td>1,263</td>
<td>1,361</td>
<td>98</td>
<td>7.76</td>
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</table>

Table 6
SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES ASSISTED BY SJU, TAEJON CAMPUS, 1978-79

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Employment, 1978-78</th>
<th>Variation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Start</td>
<td>End</td>
<td>Absolute</td>
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<tr>
<td>Dong-A Pencil Industry</td>
<td>300</td>
<td>300</td>
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<td>Measung Agr. Chemical</td>
<td>120</td>
<td>120</td>
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<tr>
<td>Kyung In Moolsan</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Hong Do Food</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Han Mi Towel</td>
<td>290</td>
<td>299</td>
<td>9</td>
</tr>
<tr>
<td>Tae-A Industrial</td>
<td>20</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Han Mi Paint</td>
<td>80</td>
<td>86</td>
<td>6</td>
</tr>
<tr>
<td>Sam Sung Sodium Chloride</td>
<td>5</td>
<td>5</td>
<td>-</td>
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<tr>
<td>Tae Ginang Oxygen</td>
<td>31</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>Tae Dong Food</td>
<td>11</td>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td>Dae Won Food</td>
<td>7</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Hwashin Industrial</td>
<td>37</td>
<td>37</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>907</td>
<td>928</td>
<td>21</td>
</tr>
</tbody>
</table>


3. Energy and Small-Scale Industries. The SJU research staff continues working in the area of solar energy, and during the program year several items of solar energy hardware have been developed or improved. As early as 1976, the Seoul campus staff developed a solar flat-plate collector. A second-generation collector was designed in 1977 utilizing lighter materials, less costly indigenous products, and providing a better efficiency. The ultimate goal is to produce a design which can be manufactured in commercial quantities by small-scale industry at a price affordable by the Korean consumer. During this reporting year this activity was continued and a solar plate collector was constructed as per the new design generated. Figure 2 presents a picture of the second-generation solar plate collector.
During the year, experiments were continued on the solar water heater which was built at Ma Dong Village in Wae-San Myon during Year IV by Professor Charles Krauth of the Taejon campus. The hothouse has proven very successful so far in the experiment, and due to its location in Ma Dong, close to a favorite resting place of local farmers, it has had maximum exposure.

Figure 2
EXPERIMENTAL SOLAR PLATE COLLECTOR-SJU
4. **Appropriate Technology.** The staff of the Taejon campus has continued working on the development of a semi-portable methane gas generator using animal dung as raw material. At the Seoul campus, in response to the needs of two local companies (Kukie Industries and Chungang Hwashin), an appropriate technology device was developed to assist in the manufacture of gut strings for tennis rackets. This device was developed by Professor Yeong-Seok during the reporting year. At the Taejon campus the staff is now developing an appropriate technology device to frighten birds away from the planted crops (rice). They are being assisted by the Intermediate Technology Development Group, Ltd., London, in the development of this device.

5. **Organizational Linkages and Information Exchange.** During Year V SJU continued working with the Korea Credit Guarantee Fund (KCGF), the Korean Federation of Small Business (KFSB), the Korean Ministry of Commerce and Industry (KMCI), and the Korea Medium Industry Bank (KMIB). Additional linkages were established at the Taejon campus with the Institute of Internal Revenue Services, the Asia Foundation, the Ministry of Trade, Industry and Labor of the Solomon Islands, the Taejon Chamber of Commerce and Industry, the Village Technology Innovation Experiment (Ethiopia), the Deutsche Gesellschaft Fur Technische Zusammenarbeit (West Germany), and the Settlement Study Center of Israel. During the year, Dr. Seyeul Kim, Director of the Regional Development Institute, Taejon, was appointed as a consultant to the Korea Credit Guarantee Fund.

6. **Educational and Training Activities.** The Seoul campus presented an industrial seminar on electric correspondence technique and some 40 persons participated. The Taejon staff presented, in conjunction with the Taejon Chamber of Commerce and Industry, a short course on industrial design. The course was presented in two segments: theory and practice. More than 50 participants were present, among them local managers, engineers, and industrial designers. Other lectures, workshops, and speeches were presented on such topics as regional development planning, central government training, new community development movement, and rural regional development. Dr. Yoong Bae Ouh visited the OIP headquarters in Atlanta during the month of November 1978 to exchange information and to obtain guidance in the preparation of the final report.
7. Publications. Five publications were completed by the counterpart staff at the Seoul campus and another nine prepared by the Taejon staff. The titles of these publications are as follows:


g. "Systematic Linkages between RDI Activities and the Department of Regional Development Model Curriculum Building," by Dr. Seyeul Kim.


k. "Chemical and Nutritional Studies on Dioscorea Japonica Thunberg," by Professor Chong Ick Kim.

l. "The Role of Entrepreneurship in Regional Development," by Mr. Myeong Kee Chung.
m. "Extension Service Report-Case of Sungnam Industrial Co.," by staff.

n. "Extension Service Report-Case of Kukje Special Metal Co.," by staff.

8. Audiovisual Documentation. The fifth year of audiovisual documentation was completed by the joint project staff. Mr. F. Malvar of OIP taped some of the old technical assistance cases presented in Years I-IV as well as some selected new cases from this year. Copies of the corresponding tapes and photographs have been made available to the sponsor and counterpart institution.

9. Other Activities. Again this year, the grant to SJU generated other significant activities of benefit to the grantee. For example: (a) the Korean Federation of Small Business granted $1,800 to assist in supporting the industrial extension services; (b) the United Board for Christian Higher Education in Asia provided a grant of $8,750 for a three-year research project on intermediate technology development.

Figure 3, on the following page, is the Project Plan for the activities scheduled and implemented during Year V.

Fundacao Educacional do Sul de Santa Catarina (FESSC)

One of the two original counterparts, FESSC entered the program on January 10, 1974, for the full five years to January 9, 1979.

1. Basic Data Center (CDB). As in the past years, the CDB continued to expand its holdings as well as users of the system. For Year V, new acquisitions were on the order of 2,169 items plus well over 985 additional newspaper clippings (about two file cabinet drawers). Table 7 presents the acquisitions made by CDB during this program year. A five-year summary of acquisitions also is presented in Part II of this report. It is only proper to note the fact that following the 1974 flood, the Project Director conducted an inventory of the CDB holdings and found that only 241 units had been saved from the flood; since that time, the collection has grown to over 6,300 units through this program.

At the start of the 1976-77 project year, the Project Director suggested to the CDB staff that they initiate a register in order to record the number of users of the CDB collection. This year 707 requests for information were made to the CDB staff, seven times as many as recorded for the initial year.
Project No. B-426, Year V
Project Title SIG-SJU
Project Director Nelson C. Wall

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LEGEND
Table 7
CDB - PUBLICATIONS ACQUIRED
FESSC, PROGRAM YEAR 1978-79

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<th>Type of Publication</th>
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<td>Maps</td>
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<td>Reports</td>
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<td>Monographs</td>
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<td>Journals</td>
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<td>Censuses</td>
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<td>Calendars</td>
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<td>Studies</td>
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<td>Booklets</td>
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<td>Pamphlets</td>
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<td>Newspaper Clippings</td>
<td>985*</td>
</tr>
<tr>
<td>Miscellaneous</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>2,169</strong></td>
</tr>
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</table>

* Newspaper clippings not included in total.


2. **Center for Management and Technical Assistance (CETEG)** For the past five years, CETEG has been responsible for the implementation of this project. The very successful operation of CETEG has been the key to the project's success. The CETEG staff has provided pragmatic technical and management assistance to the small and medium-scale industries of the area since Program Year I, when the director of CETEG, Mr. Humberto Dalsasso, completed his training at OIP in Atlanta, Georgia.
During the 1978-79 year, a total of 61 local industries requested assistance, but only 35 of these were considered as technical or management assistance cases. In the past five years, the counterpart staff has serviced a total of 196 technical or management assistance cases. The counterpart staff covers a geographical area of about 9,500 square kilometers, as shown on Map 2 of this report. Table 8 presents a recapitulation of the technical or management assistance cases by municipalities for the reporting year. Figures 4 and 5 are representative of two of the small-scale industries which have received technical-management assistance, and Table 9 presents the new jobs generated during the year.

Table 8
RECAPITULATION OF TECHNICAL-MANAGEMENT ASSISTANCE CASES BY MUNICIPALITIES CETEG, YEAR 1978-79

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Technical Assistance</th>
<th>Total</th>
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<tr>
<td></td>
<td>Continuous</td>
<td>Discontinuous</td>
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<tr>
<td>Criciuma</td>
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<tr>
<td>Tubarao</td>
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<td>Urussanga</td>
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<tr>
<td>Other Locations in State</td>
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<tr>
<td></td>
<td>Total</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 4

INDUSTRIA DE DOCES AUREA
(Producer of Jellies and Jams)
Figure 5
METALURGICA EQUIPE LTDA
(Manufacturer of Safes)
Table 9

VARIATION IN EMPLOYMENT OF SELECTED COMPANIES RECEIVING TECHNICAL ASSISTANCE DURING FESSC PROGRAM YEAR V

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Employment 1978-79</th>
<th>Variation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Start</td>
<td>End</td>
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<tr>
<td>Isaltino Pandini Lima</td>
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<td>13</td>
</tr>
<tr>
<td>Inel</td>
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<td>73</td>
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<tr>
<td>Indarmeling &amp; Filho</td>
<td>35</td>
<td>35</td>
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<tr>
<td>Rodflex</td>
<td>115</td>
<td>83</td>
</tr>
<tr>
<td>N. Brunato &amp; Co.</td>
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<td>42</td>
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<td>Metalurgica Souza</td>
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<td>Incoseja</td>
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<td>Metasul</td>
<td>9</td>
<td>19</td>
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<tr>
<td>Grupo Gaindzinski*</td>
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<td>3,750</td>
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<td>Fomar Ind. y Com.</td>
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<td>15</td>
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<tr>
<td>Nivaldo Cunha</td>
<td>21</td>
<td>22</td>
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<tr>
<td>Moveis Santa Barbara</td>
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<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>2,481</td>
<td>5,202</td>
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</tbody>
</table>

* Grupo Gaindzinski included two new industries started by Ceramica Eliane, which reported 800 employees at the end of the 1977-78 year.


3. Adaptive Technology Center (CATT). The Adaptive Technology Center was one of the first units established by this program during Year I. CATT was designed to serve as the focal point around which FESSC could start developing engineering and technical disciplines. During Year IV of the program, FESSC finally was able to obtain financial support from the state government to build a Technology Center to house CATT and other units. Construction began in July 1977 and the Technology Center was completed early in 1978.
At present, the Technology Center (3,200 square meters) houses CATT, which is responsible for the review and evaluation of existing technology, and will attempt in the future to adapt technologies for use by local, small-scale industries. Within the Technology Center, there are also a Food Technology Center and the Industrial-Chemical Engineering Faculty.

Figure 6 presents a phase during construction in 1978, and Figure 7 shows the Chemistry Laboratory being used by the students. The now completed Technology Center has four laboratory areas (11 classrooms and laboratories), four support areas (nine classrooms), and five offices, plus the water, power, and drainage support system. The total cost is in excess of 23 million cruzeiros (over $1.2 million at present rate), all of which is being financed by federal or state funds. This may well be the single most important accomplishment of the program.

Figure 6
TECHNOLOGY CENTER UNDER CONSTRUCTION
FESSC, JANUARY 1978
4. **Industrial Training and Education.** This segment of the program is being implemented by the newly created Department of Permanent Education (DEP), which is a spin-off of the Center for Permanent Education established by this project during Year I. During Year V, DEP presented 42 courses and 1,658 adults completed the program. Of these 42 courses, 11 were in the area of industrial management, three in health sciences, 11 in electrical-mechanical, 10 in education, one in social studies, and the balance of six can be classified as "general knowledge." Classroom hours ran from as few as eight per course to as many as 255 per course. Well over 6,000 adults have completed courses at DEP since the beginning of this program in 1974.

Staff training was continued this year and 107 registrations for training programs were made by the staff. Most of these programs were offered by other institutions in cooperation with the FESSC staff; some were presented in Tubarao, others in Florianopolis and in other cities in Brazil. The 107
participants from the FESSC staff attended a total of 26 different training programs during the past year.

5. Audiovisual Documentation. The fifth annual audiovisual documentation was carried out in mid-1978 by a member of the OIP staff, assisted by the FESSC staff. Copies of the tapes and still photographs have been made available to the sponsor and the participating counterpart institution.

6. Other Activities. Training and upgrading of the project staff has continued during this fifth year. The OIP staff on site presented a series of lectures for the senior staff of FESSC. Table 10 lists the lectures and subjects presented. The FESSC staff also completed and published two feasibility studies, 14 new manufacturing opportunity studies, three management guidelines, and two case studies.

As usual, a Project Plan was developed for Year V. This is presented as Figure 8.

University of the Philippines, Institute for Small-Scale Industries (UP/ISSI)

Most of the activities reported in this section for UP/ISSI were carried out by the Pilot Extension Office, Tacloban City, Leyte. The University of the Philippines entered the program at the start of Year III (January 10, 1976) and has now completed three years of programmed activity.

1. Extension Service. The overall project plan called for the initiation of this service during UP/ISSI Year I. Thus, early in that year the Pilot Extension Office was established in Tacloban City, Leyte, in Region VIII. Map 4 presents more detail on the area covered by this office.

During the year the Pilot Extension Office staff continued working with nine companies which had requested technical assistance during the 1977-78 program year. Of these nine firms, five were located in Tacloban City, two in Jaro, and one each on Sogod and Pinamopoan. These last four are situated in southern Leyte. Twenty additional technical assistance cases were initiated in this reporting year. Table 11 shows the geographical distribution of these 20 cases. At the end of the 1978-79 program year, a survey of a selected group of firms which had received technical assistance was conducted to determine whether there had been changes in employment figures. Table 12 presents these results.
Additional information on the employment generated in the past three years is presented in Part II of this document. As has been indicated in earlier reports, one must note that small-scale industries in the Philippines are usually quite small in employment; normally a small industry is a family group with perhaps two or three employees. Some of the firms assisted in the past have developed well and are now beginning to show good financial returns.

Table 10
LECTURES PRESENTED BY OIP STAFF
AT FESSC, 1978-79

<table>
<thead>
<tr>
<th>Date</th>
<th>Participants</th>
<th>Subject</th>
<th>OIP Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 30, 1978</td>
<td>18 members of project staff</td>
<td>Review of the 211(d) Grant and</td>
<td>N. C. Wall</td>
</tr>
<tr>
<td>March 30, 1978</td>
<td>10 members, administration</td>
<td>Review of the Small-Scale Industry Grant</td>
<td>N. C. Wall</td>
</tr>
<tr>
<td>April 2, 1978</td>
<td>170 persons, students: economics, management,</td>
<td>Role of the University in Economic Development</td>
<td>N. C. Wall</td>
</tr>
<tr>
<td></td>
<td>accounting and engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 24, 1978</td>
<td>40 students and professors: management and</td>
<td>Electrical Power Transmission</td>
<td>F. Malvar</td>
</tr>
<tr>
<td></td>
<td>economics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 25, 1978</td>
<td>50 students: management, economics and</td>
<td>Industrial Development</td>
<td>N. C. Wall</td>
</tr>
<tr>
<td></td>
<td>engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>December 18, 1978</td>
<td>35 persons: City Council of Laguna</td>
<td>Tourism Potentials of Laguna</td>
<td>N. C. Wall</td>
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Source: OIP records.
<table>
<thead>
<tr>
<th>Project No.</th>
<th>B-427, Year V</th>
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</thead>
<tbody>
<tr>
<td>Project Title</td>
<td>SIG-PESSC</td>
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<tr>
<td>Project Director</td>
<td>Nelson C. Wall</td>
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</table>

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Preparation of Final Report Year IV</td>
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<tr>
<td>Evaluation Year IV (Internal)</td>
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<td>Review of Organization</td>
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<td>Planning Year V Program</td>
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<td>Selection of New Municipalities</td>
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<tr>
<td>On-Site Assistance - N. C. Wall</td>
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<tr>
<td>Audiovisual Filming on Site</td>
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<tr>
<td>Technical Assistance Service (CETEG)</td>
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<td>Assistance to CDB</td>
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<tr>
<td>Technical Assistance to CATT</td>
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<tr>
<td>Staff Training</td>
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<td>Baseline Study</td>
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<tr>
<td>Final Evaluation (Five-Year)</td>
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</tbody>
</table>

**Figure 2**

**PROJECT PLAN**

1978-79

**LEGEND**
Map 4
Area Covered by the UP/ISSI Pilot Extension Office

Legend:
1 Northern Samar
2 Eastern Samar
3 Western Samar
4 Leyte
5 Southern Leyte
6 Biliran (Sub-Prov.)
7 Calbayog City
8 Ormoc City
9 Tacloban City—Regional Center

Philippines

Region B
Eastern Visayas Region

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Table 11
GEOGRAPHICAL DISTRIBUTION OF UP/ISSI
TECHNICAL ASSISTANCE CASES, 1978-79

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Location</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Padre Burgos, S. Leyte</td>
<td>Salt</td>
</tr>
<tr>
<td>11</td>
<td>Bato, Leyte</td>
<td>Wood Furniture</td>
</tr>
<tr>
<td>12</td>
<td>Maasin, S. Leyte</td>
<td>Charcoal</td>
</tr>
<tr>
<td>13</td>
<td>Padre Burgos, S. Leyte</td>
<td>Salt</td>
</tr>
<tr>
<td>14</td>
<td>Macrohon, S. Leyte</td>
<td>Hollow Blocks</td>
</tr>
<tr>
<td>15</td>
<td>Baybay, S. Leyte</td>
<td>Wood Furniture</td>
</tr>
<tr>
<td>16</td>
<td>Tacloban City</td>
<td>Wood Sash</td>
</tr>
<tr>
<td>17</td>
<td>Malitbog, S. Leyte</td>
<td>Hollow Blocks</td>
</tr>
<tr>
<td>18</td>
<td>Abuyog, Leyte</td>
<td>Wood Furniture</td>
</tr>
<tr>
<td>19</td>
<td>Calbayog City</td>
<td>Canned Food</td>
</tr>
<tr>
<td>20</td>
<td>Catarman, N. Samar</td>
<td>Printing</td>
</tr>
<tr>
<td>21</td>
<td>Catarman, N. Samar</td>
<td>Feedmill</td>
</tr>
<tr>
<td>22</td>
<td>Catarman, N. Samar</td>
<td>Coconut Products</td>
</tr>
<tr>
<td>23</td>
<td>Catarman, N. Samar</td>
<td>Farm Products</td>
</tr>
<tr>
<td>24</td>
<td>Tacloban City</td>
<td>Public Transportation</td>
</tr>
<tr>
<td>25</td>
<td>Tacloban City</td>
<td>Packed Paper</td>
</tr>
<tr>
<td>26</td>
<td>Alang-Alang, Leyte</td>
<td>Deep Sea Fishing</td>
</tr>
<tr>
<td>27</td>
<td>Can-Avid, E. Samar</td>
<td>Shells - Decorations</td>
</tr>
<tr>
<td>28</td>
<td>Llorente, E. Samar</td>
<td>Palm Wood</td>
</tr>
<tr>
<td>29</td>
<td>Maasin, S. Leyte</td>
<td>Car Batteries</td>
</tr>
</tbody>
</table>


Figures 9 and 10 present two small companies which have done very well in the past two years and have been assisted through this program.

The Pilot Extension Office also assisted in establishing five new industries in the area during 1978-79:

- Sash Manufacturing
- Motor Repair Shop
- Land Transportation
- Bakery
- Agricultural Products

Tacloban City
Tacloban City
Tacloban City
Catarman City
Catarman City
Table 12

VARIATION IN EMPLOYMENT OF SELECTED COMPANIES RECEIVING TECHNICAL ASSISTANCE-UP/ISSI, YEAR III

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Location</th>
<th>Employment 1978-79</th>
<th>Variation</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Start</td>
<td>End</td>
<td>Absolute</td>
<td>Percent</td>
</tr>
<tr>
<td>11</td>
<td>Bato, Leyte</td>
<td>5</td>
<td>5</td>
<td>0</td>
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</tr>
<tr>
<td>14</td>
<td>Macrohon, S. Leyte</td>
<td>109</td>
<td>129</td>
<td>20</td>
<td>18.34</td>
</tr>
<tr>
<td>15</td>
<td>Baybay, S. Leyte</td>
<td>14</td>
<td>14</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Malitbog, S. Leyte</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>Abuyog, Leyte</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>Calbayog City</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>170</strong></td>
<td><strong>20</strong></td>
<td><strong>13.33</strong></td>
</tr>
</tbody>
</table>


Figure 9

SAN JUANICO MANUFACTURING INDUSTRIES
2. **Industrial Training.** The UP/ISSI staff is heavily involved in industrial training programs, at its headquarters in Manila as well as in other locations throughout the Philippines. Usually these industrial training programs are in cooperation with other agencies or institutions in the country. During the year, UP/ISSI implemented training programs with the following government agencies:

- Entrepreneurial Development, University
- Leyte Sab-A Basic Development Authority
- Entrepreneurial Development, Ministry of Education
- Philippine Business for Social Progress
- Rural Workers Office
- Ministry of Social Services and Development
- Information Technology
- Coconut Board
- Ministry of Agrarian Reform
From these programs a series of publications also resulted, as well as
several feasibility studies. A complete listing of publications generated in
the past three years is presented in Part II of the report. As a result of
this activity, 28 trainers were taught to instruct rural workers in the basic
concepts of business; 28 entrepreneurs participated in a training seminar on
project feasibility study preparation, and a group of 20 rural workers com-
pleted a training program in handicraft skills.

3. **Education and Staff Training.** Mr. Cesar E. Lee, Research Assistant
with the Pilot Extension Office, received a fellowship from Technonet Asia and
attended a one-month Industrial Extension Training Course at UP/ISSI, Diliman,
Quezon City.

The officer in charge of the Pilot Extension Office, Mr. Redentor C. Da-
kanay, participated in a three-week Residency Program in Industrial Extension
at OIP headquarters in Atlanta, Georgia. He also attended a one-week train-
ing program on Group Technology conducted by the Asian Productivity Organiza-
tion and the Productivity Development Center.

4. **Appropriate Technology.** The Pilot Extension Office continues to be
heavily involved in the development of appropriate technology. In Year III
three new appropriate technology devices were conceived and produced.

**Wood Lathe Machine Spindle.** Last year the UP/ISSI staff
developed an inexpensive wood lathe. This year, a new
spindle was designed and fabricated to improve the
original lathe.

**Steel Weaving Frame.** This metal frame was designed to
replace wood frames presently used as users had been
experiencing difficulties in obtaining the wood re-
quired for the frames. The modified metal frame has
an estimated life span of three years, which makes
them less expensive in the long run than the wood frames.

**Solar Dryer.** The staff has been experimenting with a
solar dryer based on the Brace Research Institute design.
They are attempting to modify it to serve local needs
and conditions.
5. Audiovisual Documentation. The audiovisual documentation was initiated during UP/ISSI program Year I and was continued this year. Mr. F. Malvar of OIP, together with Ms. Dotsie Vinuya, completed Year III audiovisual documentation in the provinces of Leyte and southern Leyte.

6. Other Activities. The staff continued to work with the Divine Word University in the area of entrepreneurship development. During this year the UP/ISSI staff completed nine feasibility studies, eight case studies, six industrial surveys, and eight project proposals. Figure 11, on the following page, presents the Project Plan for Year III.

University of Science and Technology, Technology Consultancy Centre (UST/TCC)

In 1977, when the University of Ife (UI) grant was discontinued, the OIP staff recommended to the sponsor that UST/TCC replace UI as a funded counterpart. The sponsor approved the recommendation and UST/TCC entered the program on June 27, 1977. This report is for the last six months of the program, the period from June 27, 1978, to January 9, 1979.

1. Stimulation of Small-Scale Industry Development. TCC considers its most important role to be the transfer of technology from the campus to the small-scale indigenous industries of Ghana. Over the years, TCC has established small demonstration enterprises in order to show local entrepreneurs how to operate these firms while, at the same time, testing technologies and adapting them to local conditions.

a. Manufacture of Steel Bolts and Nuts. In February 1973, TCC started a small unit to manufacture steel bolts and nuts, using local steel rods. This unit has proved very successful and is now a viable business. Several entrepreneurs have been interested in setting up similar operations, but were unable to do so for lack of equipment (import prohibition). During the past year, TCC was able to obtain some additional lathes and help establish one local industry to manufacture steel bolts and nuts. Also during the year, Mr. J. Russell of the Department of Economics and Industrial Management completed two reports or studies on the productivity of the unit at TCC. These studies will assist the TCC staff in continuing their experiments and technology transfer.

-63-
<table>
<thead>
<tr>
<th>Project No.</th>
<th>B-463, Year III</th>
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<tbody>
<tr>
<td>Project Title</td>
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<td>Project Director</td>
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**Start Year III (January 10, 1978)**

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<td>On-Site Assistance - R. Johnston</td>
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<td>On-Site Assistance - N. C. Wall</td>
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<tr>
<td>Industrial Extension Service</td>
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<tr>
<td>Small Industry Research</td>
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<tr>
<td>Training Workshops, Seminars</td>
</tr>
<tr>
<td>Baseline Study</td>
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<tr>
<td>Audiovisual Documentation</td>
</tr>
<tr>
<td>Staff Training (OIP)</td>
</tr>
<tr>
<td>Data Support (OIP)</td>
</tr>
<tr>
<td>Final Evaluation (Three-Year)</td>
</tr>
</tbody>
</table>

**Quarterly Reports**

**Annual & End-of-Project Report**

**LEGEND**
b. **Broadloom Weaving.** The weaving of narrow strips for the beautiful and well-known "Kente" cloth is a traditional craft in several Ashanti villages near TCC. In 1972 TCC began the introduction of a new technology, the "broadloom," to the local weavers and the broadloom weaving unit began operating. The unit has been very successful and has introduced not only the new technology, but also many products such as tablecloths, curtains, cushion covers, table mats, babies' shawls, bedspreads, napkins, fancy towels, and cloth for garments.

c. **Soap Pilot Plant.** TCC constructed a prototype soap manufacturing plant in 1973. It produced 39,000 bars of soap during the first year of operation. Later, another plant was built in the village of Kwamo which still serves as a demonstration operational plant. During this year the high cost of palm oil has been a big threat to the native soap industry, so TCC has been carrying out research to identify alternative raw materials. A short-term solution has been to encourage farmers to produce more oil at a relatively low cost. TCC designed and constructed a hand-operated screw press for the extraction of palm oil. The press is capable of pressing 20 kgs of pounded boiled palm fruit at one time with an efficiency rating of 75% to 80%. Figure 12 shows an oil press being completed at the TCC shop. At the same time, the TCC staff has been involved in finding local plants with seeds which can produce oil suitable for soap making at lower cost than that of palm oil. So far, experiments have been conducted with oils extracted from several local plants; namely, castor beans, physic nuts, monkey cola, and neem. During this year a three-acre planting of castor beans was begun as well as 1½ acres of physic nuts.
d. Sugar Pilot Plant. For several years TCC negotiated with government agencies for a contract to build a sugar pilot plant on the lines of the soap plant. The idea was to develop a rural industry with a daily output of around one ton of sugar. In April 1977 TCC was awarded a 12-month contract to design such a plant. The work was partially completed during this reporting year, and plans are now being developed to finance construction of the pilot plant.

2. Rural Industries of Ashanti. The Ashanti traditional craft industry promotion program was begun at TCC in 1974. The program was continued this year as part of the grant activities. The Craft Tourist Centre at Wonoo was completed under separate funding from Oxfam in the U.K. When the Centre is opened in early 1979, it will be a regular stopping and resting place and will provide the following facilities:
o A craft area where both traditional and broadloom weaving will be on display.
o A refreshment area where drinks and food will be sold.
o A sales area where "Kente" cloth, "Adinkra" cloth, brass castings, and glass beads will be sold at controlled prices.
o Two bedrooms to accommodate four persons at a minimal fee.
o A courtyard whose walls are decorated with symbolic mural designs which will be used for showing films in the evenings or at other social functions.

a. **Brass Casting - Korofofurom.** Over the years, TCC has been attempting to help traditional Kurofofurom brass founders diversify their products. It was decided to investigate seriously the possibility of applying their lost-wax method of casting to the production of simple architectural fittings, such as window catches, knobs, and door handles. During the program year, the successful reproduction of wax castings has been introduced by the use of plaster of Paris molds, and beeswax used has been improved by the addition of appropriate amounts of tallow. The TCC staff also developed an appropriate technology furnace for brass casting which is presently being tested by one of the craftsmen from a nearby village. A picture of this furnace is presented in Part II of this report.

b. **Glass Beads.** During this year, TCC continued its research work to upgrade the glass bead industry in the area of Daabar. TCC has been able to obtain coloring for the beads and also has introduced appropriate techniques for polishing the finished product.

c. **Rubber Products.** An existing rubber plantation has been reactivated and an appropriate technology roller press is now in operation making coagulated rubber sheets. Figures 13 and 14 depict a rubber tree producing latex and the device now in operation. In order to dry the coagulated rubber sheets, the TCC staff converted an existing appropriate technology dryer (designed for drying fish) to be used in the drying of the rubber sheets.
Figure 13
RUBBER TREE - TCC PLANTATION

Figure 14
APPROPRIATE TECHNOLOGY PRESS FOR MAKING RUBBER SHEETS
d. Lemongrass Distillation. Several years ago, another OIP counterpart institution, the Central American Research Institute for Industry (ICAITI), developed an appropriate technology device to distill lemongrass. This technology was transferred to TCC, which built on the campus an adapted device. The lemongrass extract is currently being tested in the manufacture of toilet soap. Figure 15 shows the still at the TCC shop.

Figure 15
LEMONGRASS DISTILLER

3. Training. A member of the TCC staff, Mr. K. Opoku-Debrah, visited the OIP headquarters in Atlanta and participated in a three-week Residency Program in Industrial Extension. The training program incorporated various training methods, including tours and exposure to local small-scale industries.

Local training programs were offered by TCC in the various pilot plants and manufacturing units. Details of the numbers of persons trained are presented in Part II of this report.
4. **Pyrolysis.** Under a separate project, TCC, the Building and Road Research Institute of Ghana, and OIP have been developing a prototype pyrolytic convertor to produce charcoal and fuel oil from sawdust and sawmill wastes. The test unit has been completed and at present is being tested. Once the prototype is operational, three additional units will be built and installed at a location selected by the Building and Road Research Institute.

The four pyrolytic convertors will be used to operate a brick kiln. Figure 16 shows the prototype unit at the TCC campus.

**Figure 16**

*PYROLYTIC CONVERTOR, TCC CAMPUS*

5. **Audiovisual Documentation.** The second annual audiovisual documentation was completed during the year. Copies of the tapes and still photographs have been made available to the sponsor and to counterpart institutions.

6. **Other Activities.** At the request of TCC, the OIP staff completed literature searches and provided materials on a series of topics. Figure 17, which appears on the following page, is the Project Plan for this year.
**Project No.** B-492  
**Project Title** Small-Scale Industry Program--TCC  
**Project Director** Nelson C. Wall

### Project Plan

<table>
<thead>
<tr>
<th>Task Description</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Assistance Field Support to TCC</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Training Program Development (Atlanta)</td>
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</tr>
<tr>
<td>Training Program Execution (Atlanta)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarterly Report Submission to TCC</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Report Submission to TCC/USAID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Support to TCC by the OIP Int'l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development Data Center</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 17**  
**PROJECT PLAN**  
**Year II**  
1978-79  

**LEGEND**
Office of International Programs (OIP)

As in past years, each of the counterpart institutions invested 50% of its grant funds to contract with the Office of International Programs to provide the required technical support, training, and consultancy assistance, as well as the audiovisual documentation of the individual projects. Detailed accounts of actions taken and on-site assistance provided by the OIP staff are given in the individual trip reports for the year, but are not included with this document. Copies of the trip reports are available to the sponsor upon request.

A number of members of the OIP staff were on site during Year V to provide the above-mentioned support services. Listed below are the names of all members of the OIP staff who were on site under these four projects during the 1978-79 grant year.

Soong Jun University (B-426)

April 30 - May 12, 1978                      Richard Johnston
July 14 - July 31, 1978                    Frank Malvar
July 15 - August 14, 1978                   Donald E. Lodge
November 22 - December 2, 1978             Nelson C. Wall

Fundacao Educacional do Sul de Santa Catarina (B-427)

March 16 - April 7, 1978                    Nelson C. Wall
August 13 - August 30, 1978                 Nelson C. Wall
August 13 - August 30, 1978                 Frank Malvar
December 17 - December 21, 1978             Nelson C. Wall

University of the Philippines (B-463)

April 8 - April 28, 1978                      Richard Johnston
July 2 - July 14, 1978                      Frank Malvar
August 21 - September 6, 1978               Ross W. Hammond
November 12 - November 21, 1978             Nelson C. Wall

University of Science and Technology (B-492)

April 22 - May 6, 1978                   Donald E. Lodge
May 30 - July 9, 1978                    Ross W. Hammond
September 30 - October 26, 1978            Frank Malvar
October 27 - November 10, 1978              Nelson C. Wall
PART II
LIFE OF PROJECT
SUMMARY OF ACCOMPLISHMENTS, 1974-79

At the end of the five years of this program (A-1600), OIP has successfully established four counterpart projects with operations overseas; a fifth was started but had to be terminated. Two of these counterparts participated the full five years and have shown that they are capable of continuing to assist their local small-scale industries if funding support is provided by their institutions. All four existing counterparts are fully dedicated to the basic concept of generating employment, expanding small-scale industries, and providing pragmatic technical assistance to local entrepreneurs.

The existing counterparts are capable of operating with minimal technical support from outside sources and have proved their ability to implement action-oriented programs of technical-management assistance to small-scale industries. The accomplishments highlighted in the previous sections speak for themselves. Each of the counterpart institutions had to adapt the methodology offered by OIP, and assisted by the technical staff of OIP, was able to implement the methodology.

Among the five counterparts, more than 5,100 new jobs have been generated in rural areas of developing nations. These institutions have now trained 16 staff members at OIP. These persons are capable, to varying degrees, of (a) conducting appropriate research, (b) transferring technology, (c) managing technology, (d) adapting existing technology, (e) developing methodology, as well as designing, implementing, and managing industrial programs and industrial training programs.

Some 29 appropriate technology devices or manufacturing processes have resulted from this program. At the same time, some 515 technical-management assistance cases were serviced by the counterparts and more than 8,600 persons participated in and completed industrial training programs.

The counterpart institutions have started their own data bases and some have good-sized holdings at this time. A great number of research papers, feasibility studies, monographs, and other data have been published by the participating institutions. The following sections will highlight the individual accomplishments of the participating counterparts.
Starting in calendar year 1974, Soong Jun University (SJU) received a grant and assistance from the Office of International Programs (OIP) of the Engineering Experiment Station at the Georgia Institute of Technology. The principal objective of this cooperative program has been to generate employment by the expansion of existing small-scale industries, as well as to help, where feasible, other small-scale industries in that country.

Reports of past activities and accomplishments have been submitted on schedule.\(^1\) Presented below is a summary of the achievements over the past five years.

1. **Appropriate Technology.** The counterpart staff has actively pursued the concept of appropriate technology and, over the past five years, has developed, constructed, and field-tested 12 appropriate technology devices. These devices are:

   - Low-cost tensile strength tester
   - Sizing or shaving die for truing metal cross sections
   - Low-cost immersion pyrometer
   - Flat-plate solar collector
   - Multi-tapping machine
   - Drilling fixture
   - Filter press
   - Bicycle brake testing device
   - Semi-portable methane gas generator
   - Third generation "cheegay" (traditional backpack)
   - Device to assist in manufacturing gut strings for tennis rackets
   - Device to frighten birds (crop protection)

   Detailed drawings of these devices may be requested directly from the counterpart institution. Many of these appropriate technology devices were developed during the provision of technical assistance to local firms. Usually, the developed tool was donated to the company being serviced.

2. Employment Generation. One indicator used in this project to determine the possible impact of the services provided has been the number of new jobs directly generated by the program.

Table 13 presents the employment variance reported by the SJU staff in the companies they have monitored.

![Table 13: Variation in Employment of Companies Receiving Technical Assistance SJU, 1974-79](image)

According to this information, the 100 companies which were monitored experienced an average increase of 6.32 jobs per company in the five-year period.

In the Taejon area, 10 of these 100 companies were monitored for all five years. Their labor force changes are presented in Table 14.
Table 14
VARIATION IN EMPLOYMENT OF
TEN SELECTED COMPANIES, TAEJON AREA
KOREA, 1974-79

<table>
<thead>
<tr>
<th>Name of Company</th>
<th>Start 1974</th>
<th>End 1979</th>
<th>Absolute Variance</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shin Sung Paper Mill</td>
<td>77</td>
<td>96</td>
<td>19</td>
<td>24.67</td>
</tr>
<tr>
<td>Kook Ri Machinery</td>
<td>10</td>
<td>13</td>
<td>3</td>
<td>30.00</td>
</tr>
<tr>
<td>Shin Kinang Textile</td>
<td>105</td>
<td>127</td>
<td>22</td>
<td>20.95</td>
</tr>
<tr>
<td>Nam-Il Machinery</td>
<td>25</td>
<td>130</td>
<td>105</td>
<td>420.00</td>
</tr>
<tr>
<td>Hae Ryuk Machinery</td>
<td>115</td>
<td>135</td>
<td>20</td>
<td>17.39</td>
</tr>
<tr>
<td>Moon Kinang Towels</td>
<td>13</td>
<td>25</td>
<td>12</td>
<td>92.30</td>
</tr>
<tr>
<td>Dae Won Paper Mill</td>
<td>270</td>
<td>334</td>
<td>64</td>
<td>23.70</td>
</tr>
<tr>
<td>Nam Sun Machinery</td>
<td>92</td>
<td>204</td>
<td>112</td>
<td>121.73</td>
</tr>
<tr>
<td>An Jon Bicycle</td>
<td>83</td>
<td>106</td>
<td>23</td>
<td>27.71</td>
</tr>
<tr>
<td>Don Jin Leather</td>
<td>46</td>
<td>66</td>
<td>20</td>
<td>43.47</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>836</strong></td>
<td><strong>1,236</strong></td>
<td><strong>400</strong></td>
<td><strong>47.84</strong></td>
</tr>
</tbody>
</table>


As may be noted, the companies monitored over the full five-year period have reported a much higher number of new jobs generated than the 100 shown in Table 13. These 10 companies have averaged 40 new jobs per company during the life of the project.

The SJU project staff also kept records on increase/decrease of productivity of the selected companies. This information was gathered to be used as another indicator in determining the results or accomplishments achieved by the project. Table 15 presents the information reported by the counterpart staff.
Table 15

PRODUCTIVITY INCREASES IN SELECTED COMPANIES
TAEJON AREA, 1974-78*

<table>
<thead>
<tr>
<th>Name of Company</th>
<th>Products</th>
<th>Units</th>
<th>1974</th>
<th>1978</th>
<th>Absolute</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shin Sung Paper Mill</td>
<td>Paper</td>
<td>Tons</td>
<td>12.2</td>
<td>21.3</td>
<td>9.1</td>
<td>74.59</td>
</tr>
<tr>
<td>Kook Ri Machinery</td>
<td>Milling Mach.</td>
<td>Units</td>
<td>20.0</td>
<td>30.0</td>
<td>10.0</td>
<td>50.00</td>
</tr>
<tr>
<td>Shin Kinang Textile</td>
<td>Textiles</td>
<td>1,000 sq. mts.</td>
<td>282.7</td>
<td>627.2</td>
<td>344.5</td>
<td>121.86</td>
</tr>
<tr>
<td>Nam-Il Machinery</td>
<td>Milling Mach.</td>
<td>Units</td>
<td>50.0</td>
<td>96.0</td>
<td>46.0</td>
<td>92.00</td>
</tr>
<tr>
<td>Hae Ryuk Machinery</td>
<td>Farm Equipt.</td>
<td>1,000 units</td>
<td>32.5</td>
<td>69.8</td>
<td>37.3</td>
<td>114.76</td>
</tr>
<tr>
<td>Moon Kinang Towels</td>
<td>Towels</td>
<td>1,000 sq. mts.</td>
<td>600.0</td>
<td>780.0</td>
<td>180.0</td>
<td>30.00</td>
</tr>
<tr>
<td>Dae Won Paper</td>
<td>Paper</td>
<td>Tons</td>
<td>32.1</td>
<td>69.8</td>
<td>37.7</td>
<td>117.44</td>
</tr>
<tr>
<td>Nam Sun Machinery</td>
<td>Milling Mach.</td>
<td>Units</td>
<td>120.0</td>
<td>278.0</td>
<td>158.0</td>
<td>131.66</td>
</tr>
<tr>
<td>An Jon Bicycle</td>
<td>Bicycle Gears</td>
<td>1,000 units</td>
<td>550.0</td>
<td>671.0</td>
<td>121.0</td>
<td>22.00</td>
</tr>
</tbody>
</table>

* Fifth year (1979) statistics not available at the time of preparation of this report.

Source: SJU, Taejon Annual Report, years 1974-78.

The basic action was, as has been indicated, to provide technical-management services to small-scale industries in the target areas. During the life of the project, the SJU staff reports having provided these services to 137 companies, as detailed in Table 16.
Table 16
SUMMARY OF TECHNICAL-MANAGEMENT
ASSISTANCES CASES, SJU, 1974-79

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Technical Assistance Cases</th>
</tr>
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<tbody>
<tr>
<td>1974-75</td>
<td>18</td>
</tr>
<tr>
<td>1975-76</td>
<td>28</td>
</tr>
<tr>
<td>1976-77</td>
<td>33</td>
</tr>
<tr>
<td>1977-78</td>
<td>28</td>
</tr>
<tr>
<td>1978-79</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>137</td>
</tr>
</tbody>
</table>

Source: SJU Annual Report, years 1974-79.

Details of the problems and solutions suggested by the counterpart staff are presented in the individual year reports.

3. Education and Training. When this program was initiated in 1974, it was determined that since SJU was a technologically oriented institution, it would be desirable to assist it in expanding its engineering programs to include industrial engineering. It also was anticipated that through such an extension, future SJU graduates could participate more usefully in the industrial development of Korea.

As a result of this single action, the appropriate national authorities eventually allowed SJU to establish the Department of Industrial Engineering as part of the College of Engineering at SJU. Several members of the OIP and GIT academic staffs were involved in assisting the new department while it was being established. The impact or benefit which this single accomplishment may produce cannot be quantified at this time, but all members of the joint staffs consider it to be significant.

Industrial training also has been an objective of this program. In the past five years, the two staff groups (Seoul and Taejon) have presented 18 industrial training programs for local participants. Table 17 is a summary of these programs.
Table 17
INDUSTRIAL TRAINING PROGRAMS
SJU, 1974-79

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Participants</th>
<th>Number of Industrial Training Programs Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974-75</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>1975-76</td>
<td>500</td>
<td>5</td>
</tr>
<tr>
<td>1976-77</td>
<td>98</td>
<td>2</td>
</tr>
<tr>
<td>1977-78</td>
<td>310</td>
<td>8</td>
</tr>
<tr>
<td>1978-79</td>
<td>90</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1,038</td>
<td>18</td>
</tr>
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</table>

Source: SJU, Annual Report, years 1974-79.

Also as part of the program of work in the area of industrial training and education, several members of the SJU staff participated in special training programs offered by OIP at its headquarters in Atlanta, Georgia. Table 18 provides details on this activity.

Other staff members, including the President of SJU, visited OIP headquarters in Atlanta, but they have not been listed. Many other educational seminars, conferences, and workshops were presented in loco by the joint project staff during the life of this project.

4. Data Collection Development. The Small-Scale Industry Information Center (SSIIC) was established on the Seoul campus during Year I. In 1975, this unit was relocated to the Department of Industrial Engineering and the project staff did not continue keeping records of the data acquisitions. A similar unit was started on the Taejon campus, and these records are available for the past five years. Figure 18 shows the number of books and other documents acquired yearly by the collection. Of the total of 5,529 units added to the data center, many were donated by institutions and individuals.
Figure 18
GROWTH OF ACQUISITIONS
DATA CENTER, SJU, TAEJON
1974-79

Source: SJU Project Records - Taejon Campus
Table 18
SJU STAFF TRAINING AT OIP, 1974-79

<table>
<thead>
<tr>
<th>Participant</th>
<th>Title</th>
<th>Starting Date</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>Hae Byung Lee</td>
<td>Assoc. Director, RDI</td>
<td>July 1, 1974</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Jae Bok Yoon</td>
<td>Chairman, Dept. of Mechanical Eng.</td>
<td>July 1, 1974</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Clarence Prince</td>
<td>Dean of Engineering</td>
<td>July 1, 1974</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Won-Hoe Koo</td>
<td>Head, Chemistry Dept.</td>
<td>July 1, 1975</td>
<td>5 weeks</td>
</tr>
<tr>
<td>Young-Ho Chae*</td>
<td>Pres., Sam Ho Machine Co.</td>
<td>July 1, 1975</td>
<td>5 weeks</td>
</tr>
<tr>
<td>Byoung-Kyu Choi</td>
<td>Acting Chairman, Dept. of Engineering</td>
<td>July 10, 1976</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Yoon-Bae Ouh</td>
<td>Counterpart Proj. Director</td>
<td>November 17, 1978</td>
<td>1 week</td>
</tr>
</tbody>
</table>

* Not a staff member of SJU.

Source: Project Director's records.

5. Research Papers and Publications. A significant number of research papers, industrial case studies, and other publications have been completed by the SJU staff during the life of the project. The following listing highlights the more important documents published.

1974-75: "Trends of Korean Small-Scale Industries During the Period 1974"
          "Study on Park Development Planning in Chonan"
          "A Preliminary Study on the Small-Medium Industries Potential in the Regional Development of the Taejon Area"
          "A Study on Industrial Site Selection and the Types of Industry for Choong Nam Province"
          "Final Report: Small-Scale Industry Grant - Soong Jun University Activities 1974-75"

1975-76: "A Study on Small-Medium Entrepreneurs in Korea"

1976-77: "The Sam-Ho Woodworking Machine Manufacturing Company - A Case Study"
          "Low-Cost Tensile Strength Tester and Immersion Pyrometer"
1976-77: "Sam-Shin Sewing Machine Company - A Case Study"
(cont'd.) "A Study on the Marketing Structure of Textiles in Choong Nam Province"

1977-78: "A Case Study on the Possibility of Improving Simple Traditional Farm Equipment in Korea"
"Theory and Practice of Community Development"
"Model Curriculum for a Department of Community and Regional Development"
"The Economic and Social Determinants of Rural-Urban Migration in Korea"

1978-79: "A Study on Improvement of the Domestic Racket Gut"
"A Study of Lighting Performance Calculations and Shielding Angle on the 345 KV EHV Transmission Line"
"A Study on the Fabrication of a CaTe-CdS Solar Cell and Its Properties"
"A Study on the Performance of a LiBr-Water Absorption Refrigeration"
"Probability of Error for Frequency-Shift Keying"
"A Pictorial History on the Development of an Improved Cheegay"
"Sungnam Industrial Co. - A Case Study"
"Kukje Special Metal Co. - A Case Study"

6. Organizational Linkages. As a result of the AID-sponsored grant, over the past five years SJU has been able to lay the necessary groundwork to gain recognition as a leading Korean institution in the field of stimulating and fostering small-scale industry. The institution has established linkages with the Korea Credit Guarantee Fund, the Korean Federation of Small Business, the Korea Ministry of Commerce and Industry, the Korea Medium Industry Bank, and many others.

7. Audiovisual Documentation. Five years of audiovisual documentation are now available as a result of this program. Furthermore, the SJU staff has been trained and equipment purchased so that in the future they may continue this documentation on their own.

8. Financial Commitment. The administration of SJU has committed itself to supporting this project in the past and plans to continue it once the grant funds cease as programmed. As shown in Table 19, over the past five years, AID has provided $229,974 through this grant and SJU has matched this investment with an additional $104,950. Over the life of the project, a total of
<table>
<thead>
<tr>
<th>Year</th>
<th>Expenditures</th>
<th>AID</th>
<th>SJU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Direct Salaries and Wages</td>
<td>11,100</td>
<td>-</td>
<td>11,100</td>
</tr>
<tr>
<td></td>
<td>Travel</td>
<td>4,810</td>
<td>-</td>
<td>4,810</td>
</tr>
<tr>
<td></td>
<td>International</td>
<td>1,500</td>
<td>-</td>
<td>1,500</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td>2,900</td>
<td>-</td>
<td>2,900</td>
</tr>
<tr>
<td></td>
<td>Materials and Supplies</td>
<td>1,000</td>
<td>-</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td>Conferences/ Seminars</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
</tr>
<tr>
<td></td>
<td>Contract Services (GIT)</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td>Audiovisual Documentation</td>
<td>1,190</td>
<td>-</td>
<td>1,190</td>
</tr>
<tr>
<td></td>
<td>Technical Research and Support</td>
<td>8,000</td>
<td>-</td>
<td>8,000</td>
</tr>
<tr>
<td></td>
<td>Overhead</td>
<td>45,000</td>
<td>-</td>
<td>45,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>45,000</td>
<td>45,000</td>
<td>90,000</td>
</tr>
</tbody>
</table>

Participation Ratio: AID 100.00% | SJU 0.00% | Total 72.8% | 72.6% | 72.6% | 49.6% | 68.7% | 50.4% | 31.3%

* Includes cost sharing from industry, university, and foundations.
** Includes $45,000 grant plus an additional $4,974 from B-455, as authorized by sponsor, for a total of $49,974.

Source: Project accounting files and counterpart financial records.
$334,924 was disbursed, of which AID contributed 68.66% and SJU matched 31.34%. Figure 19 is a graphic summary of the year-to-year funding of this project.

In addition to the above AID funding, SJU has received grants from many other institutions for research projects and general support to the university. Much of the credit for these accomplishments belongs to the counterpart staff. Figure 20 is a photograph of the two Counterpart Project Directors, Dr. Yoon-Bae Ouh and Dr. Seyeul Kim, but many other staff members were involved in this work.
Figure 19
SOONG JUN UNIVERSITY
GRANT AND PROJECT FUNDS
1974-79

Dollars

334,924

Source: Table 19
Figure 20

COUNTERPART PROJECT DIRECTORS, SJU
(From left to right, Dr. Y. B. Ouh and Dr. S. Kim)
FUNDACAO EDUCACIONAL DO SUL DE SANTA CATARINA, 1974-79

The Fundacao Educacional do Sul de Santa Catarina (FESSC) project also was initiated at the start of calendar year 1974. The Office of International Programs (OIP) and FESSC had been working together since 1972, at which time a senior member of the FESSC staff participated in a 13-week internship program at OIP headquarters in Atlanta. As part of his program of work, the FESSC staff member developed a long-range economic development plan for South Santa Catarina. Many of the actions outlined in that long-range plan were later implemented under this program.

Reports of the past years' activities and accomplishments have been submitted to the sponsor annually,\(^1\) and the following section is only a highlight of the accomplishments over the past five years.

1. **Employment Generation.** In 1973-74, the target area had a population of 541,000 inhabitants\(^2\) living in a land area of 9,400 square kilometers. At the time, this huge area encompassing 32 municipalities was considered "depressed" by the government of Brazil, and one of the principal objectives of this project was to assist in the generation of employment within the area.

   From the start, records were kept on as many companies as possible to determine if any new jobs were being generated and, if so, how many. Thirty companies receiving technical-management assistance were monitored to determine their variation in employment. Of this number, 16 were followed for the full five years, three for the years 1975-79, five for the period 1976-79, and six cover the period 1977-79. In total, FESSC reports the generation of 4,504 new jobs in the 30 companies monitored over the five years. (See Table 20.)

   From the reported information, it appears that these 30 companies have done well in generating new employment at an average of 150 new jobs per company over the five-year period. In a further attempt to quantify the development of these selected companies, the FESSC team also kept records on their annual sales. Table 21 presents this information in detail.

---

\(^2\) The 1970 Census of Brazil reported 496,765; the above figure is adjusted to 1973-74.
Table 20
VARIATION IN EMPLOYMENT OF MONITORED COMPANIES RECEIVING TECHNICAL-MANAGEMENT ASSISTANCE
FESSC, 1974-79

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Period Monitored</th>
<th>Start</th>
<th>End</th>
<th>Absolute</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1974-79</td>
<td>17</td>
<td>33</td>
<td>16</td>
<td>94.11</td>
</tr>
<tr>
<td>2</td>
<td>1974-79</td>
<td>43</td>
<td>48</td>
<td>5</td>
<td>11.62</td>
</tr>
<tr>
<td>3</td>
<td>1974-79</td>
<td>12</td>
<td>45</td>
<td>33</td>
<td>275.00</td>
</tr>
<tr>
<td>4</td>
<td>1974-79</td>
<td>5</td>
<td>13</td>
<td>8</td>
<td>160.00</td>
</tr>
<tr>
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<td>1974-79</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>60.00</td>
</tr>
<tr>
<td>6</td>
<td>1974-79</td>
<td>43</td>
<td>73</td>
<td>30</td>
<td>69.76</td>
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<tr>
<td>7</td>
<td>1974-79</td>
<td>27</td>
<td>22</td>
<td>-5</td>
<td>-18.50</td>
</tr>
<tr>
<td>8</td>
<td>1974-79</td>
<td>30</td>
<td>35</td>
<td>5</td>
<td>16.66</td>
</tr>
<tr>
<td>9</td>
<td>1974-79</td>
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<td>83</td>
<td>23</td>
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<td>10</td>
<td>1976-79</td>
<td>272</td>
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<td>478</td>
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<td>2,751</td>
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<td>3</td>
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<tr>
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<td>29</td>
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<td>21</td>
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<td>1977-79</td>
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<td>Total</td>
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Source: FESSC, Final Report, Year V.
<table>
<thead>
<tr>
<th>Case No.</th>
<th>Period Monitored</th>
<th>Start</th>
<th>End</th>
<th>Absolute</th>
<th>Percent</th>
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<tbody>
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<td>290.53</td>
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<tr>
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<tr>
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<td>3,225</td>
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<td>762</td>
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<tr>
<td>18</td>
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<td>194,682</td>
<td>384,000</td>
<td>129,318</td>
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<td>1975-79</td>
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<td>2,880</td>
<td>590</td>
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<td>6,000</td>
<td>1,136</td>
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<tr>
<td>25</td>
<td>1977-79</td>
<td>2,840</td>
<td>4,500</td>
<td>1,660</td>
<td>58.45</td>
</tr>
<tr>
<td>26</td>
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<td>9,500</td>
<td>5,447</td>
<td>134.39</td>
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<tr>
<td>27</td>
<td>1977-79</td>
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<td>36,970</td>
<td>34,130</td>
<td>1,201.76</td>
</tr>
<tr>
<td>28</td>
<td>1977-79</td>
<td>8,707</td>
<td>10,824</td>
<td>2,117</td>
<td>24.31</td>
</tr>
<tr>
<td>29</td>
<td>1977-79</td>
<td>611</td>
<td>4,000</td>
<td>3,389</td>
<td>554.66</td>
</tr>
<tr>
<td>30</td>
<td>1977-79</td>
<td>2,840</td>
<td>3,000</td>
<td>160</td>
<td>5.63</td>
</tr>
<tr>
<td>Total</td>
<td>852,022</td>
<td>1,903,195</td>
<td></td>
<td>1,051,173</td>
<td>123.37</td>
</tr>
</tbody>
</table>

Source: FESSC, Final Report, Year V.
According to the FESSC report, the annual sales figures reported have been adjusted for inflation of the cruzeiro. It appears that the 30 monitored companies have had a very healthy growth over the period of time that they have been assisted by the counterpart staff.

The main action provided, as has been indicated, was technical-management assistance to small-scale industries located in the selected area. During the life of the project, the FESSC staff provided technical-management assistance to many companies in addition to the 30 monitored firms, as shown in Table 22.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number of Cases</th>
<th>Number of Technical Assistance Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974-75</td>
<td>45</td>
<td>24</td>
</tr>
<tr>
<td>1975-76</td>
<td>57</td>
<td>37</td>
</tr>
<tr>
<td>1976-77</td>
<td>70</td>
<td>45</td>
</tr>
<tr>
<td>1977-78</td>
<td>62</td>
<td>34</td>
</tr>
<tr>
<td>1978-79</td>
<td>61</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>295</td>
<td>175</td>
</tr>
</tbody>
</table>

Source: FESSC, Final Report, Year V.

Of the 32 municipalities in the target area, 16 received technical-management assistance during the life of the project. Due to the limited funding available, it was not possible to cover all of the area. Map 5 delineates the territory serviced by the FESSC staff during the past five years.

There is no doubt that both of these mini-regions were showing some signs of growth prior to the initiation of this project, but it is also true that the manufacturing/industrial and commercial sectors were the weak points in the economy. Since 1973, the FESSC staff has been keeping records on the revenue from two taxes that are representative of these activities: (a) tax on circulation of merchandise (imposto sobre circulacao de mercadorias--ICM) and
Map 5
MUNICIPALITIES RECEIVING TECHNICAL-MANAGEMENT ASSISTANCE, FESSC, 1974-79

In one or more of four years

All five years

Note: Municipalities receiving technical or management assistance from CETEG
(b) industrial production tax (imposto producao industrial--IPI). The program
does not claim the increase in these revenues as a direct achievement, but the
program did help some companies become more productive and indirectly contrib­
uted to the increases shown in Tables 23 and 24. It is interesting to note
from both of these tables that the index for South Santa Catarina is consist­
tently higher than that for the nation.

Table 23

REVENUE FROM IPI TAXES, 1973-78
(in thousands of cruzeiros)

<table>
<thead>
<tr>
<th>Year</th>
<th>Brazil Absolute</th>
<th>Brazil Index</th>
<th>South Santa Catarina Absolute</th>
<th>South Santa Catarina Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>144,699,129</td>
<td>1.00</td>
<td>254,121</td>
<td>1.00</td>
</tr>
<tr>
<td>1974</td>
<td>155,901,765</td>
<td>1.07</td>
<td>286,646</td>
<td>1.13</td>
</tr>
<tr>
<td>1975</td>
<td>163,748,316</td>
<td>1.13</td>
<td>369,252</td>
<td>1.45</td>
</tr>
<tr>
<td>1976</td>
<td>166,151,156</td>
<td>1.15</td>
<td>386,915</td>
<td>1.52</td>
</tr>
<tr>
<td>1977</td>
<td>175,766,745</td>
<td>1.21</td>
<td>571,943</td>
<td>2.25</td>
</tr>
<tr>
<td>1978*</td>
<td>160,676,596</td>
<td>1.11</td>
<td>500,926</td>
<td>1.97</td>
</tr>
</tbody>
</table>

* Estimated on the basis of the first 10 months of the year.

Source: FESSC, Final Report, Year V.

Table 24

REVENUE FROM ICM TAXES, 1973-78
(in thousands of cruzeiros)

<table>
<thead>
<tr>
<th>Year</th>
<th>Brazil Absolute</th>
<th>Brazil Index</th>
<th>South Santa Catarina Absolute</th>
<th>South Santa Catarina Index</th>
</tr>
</thead>
<tbody>
<tr>
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<td>93,413,299</td>
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<td>70,585</td>
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<td>101,360,617</td>
<td>1.08</td>
<td>119,326</td>
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<tr>
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<td>103,260,071</td>
<td>1.11</td>
<td>158,445</td>
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<td>105,884,471</td>
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<td>1978*</td>
<td>96,983,035</td>
<td>1.03</td>
<td>256,148</td>
<td>3.63</td>
</tr>
</tbody>
</table>

* Estimated on the basis of the first 10 months of the year.

Source: FESSC, Final Report, Year V.
2. **Education and Training.** In 1974, when the project was initiated, FESSC did not have a research and development capability. One of the goals established was to create such a capability. Five years later, FESSC has a Technology Center on the campus and is using this facility for research and development as well as for educational purposes. This Technology Center is described in Part I of this report.

Another accomplishment that needs to be highlighted is in the industrial training field. Over the life of the project, FESSC has presented 226 training programs and a total of 6,666 adults have completed these programs. The development of human resources (native manpower) should be considered a significant achievement within the general project goals. Table 25 presents more detail on this subject.

<table>
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<th>Table 25</th>
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<td>SUMMARY OF TRAINING PROGRAMS</td>
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<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1974</td>
<td>-</td>
<td>18</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td></td>
<td></td>
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<td>112</td>
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<td>1975</td>
<td>4</td>
<td>15</td>
<td>-</td>
<td>9</td>
<td>-</td>
<td></td>
<td></td>
<td>3</td>
<td>31</td>
</tr>
<tr>
<td>1976</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td></td>
<td></td>
<td>4</td>
<td>19</td>
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<tr>
<td>1977</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td>5</td>
<td>22</td>
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<tr>
<td>1978</td>
<td>11</td>
<td>11</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td>6</td>
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</tr>
<tr>
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<td>14</td>
<td>18</td>
<td>5</td>
<td></td>
<td></td>
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<td>226</td>
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</thead>
<tbody>
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<td>-</td>
<td>195</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td></td>
<td></td>
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<td>2,552</td>
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<tr>
<td>1975</td>
<td>131</td>
<td>454</td>
<td>-</td>
<td>192</td>
<td>-</td>
<td></td>
<td></td>
<td>26</td>
<td>803</td>
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<tr>
<td>1976</td>
<td>120</td>
<td>94</td>
<td>56</td>
<td>22</td>
<td>-</td>
<td></td>
<td></td>
<td>67</td>
<td>359</td>
</tr>
<tr>
<td>1977</td>
<td>97</td>
<td>77</td>
<td>31</td>
<td>129</td>
<td>121</td>
<td>839</td>
<td></td>
<td>1,294</td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>350</td>
<td>155</td>
<td>132</td>
<td>171</td>
<td>70</td>
<td>780</td>
<td></td>
<td>1,658</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>698</td>
<td>975</td>
<td>219</td>
<td>564</td>
<td>191</td>
<td>4,019</td>
<td></td>
<td>6,666</td>
<td></td>
</tr>
</tbody>
</table>

Source: Project files, FESSC.
Staff training has also been continued throughout the five years. Some of the staff received training at OIP headquarters; others attended training programs and seminars offered by OIP staff members while on site, and still others participated in educational and training programs offered by other institutions in Brazil. In total, 372 registrations have been recorded during this five-year period. More than 50% of these registrations were for training programs in the field of management. Three senior members of FESSC, Messrs. Humberto Dalsasso, Marcos Hemkemeier and Adalgiso Dominguez, completed a six-week training program at OIP headquarters which began on January 6, 1975.

3. Data Collection Development. Another unit of FESSC which has shown tremendous growth since 1974 is the Basic Data Center (CDB). When the project was initiated, the CDB and most of the city of Tubarao were severely damaged by a freak flood that occurred in March 1974. After the flood, the CDB was able to salvage only 241 units of its collection; since then, the CDB holdings have grown to some 6,300 units. Table 26 presents annual growth data classified by types and numbers of publications acquired, and Figure 21 is a graphic presentation of the growth of the CDB collection. The present holdings are over 26 times as large as the original collection salvaged from the 1974 flood.

4. Research Papers and Publications. As a result of the research programs conducted by the FESSC staff, many reports, studies, feasibility studies, new manufacturing opportunity studies, and other documents have been published in the past five years. Since the 153 titles of these publications have been mentioned in the yearly reports on this project, Table 27 shows only the total number published in each category in order to summarize the publications generated by this project.

In addition to the publications shown in Table 27, the FESSC staff generated 21 other research studies, under contract to other sponsors, but related to industry, education, and the economics of the area. Some of these studies are at present being used by the state government as part of its long-range plans for South Santa Catarina.

5. Organizational Linkages. The project staff, over the years, has developed very strong linkages with a large number of state and federal organizations, as well as with the industrial/commercial sector. During the life of the project, 23 formal seminars or workshops have been presented in cooperation
with one or more of these organizations. At present, FESSC is continually involved in all major actions that develop in the region and the state government is constantly seeking its advice and guidance on subjects related to the economic/industrial development of the area.

Table 26
CDB-PUBLICATIONS ACQUIRED
FESSC, 1974-79

<table>
<thead>
<tr>
<th>Type of Publication</th>
<th>1974-75</th>
<th>1975-76</th>
<th>1976-77</th>
<th>1977-78</th>
<th>1978-79</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periodicals</td>
<td>120</td>
<td>477</td>
<td>863</td>
<td>1,187</td>
<td>1,791</td>
<td>4,438</td>
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<tr>
<td>Annuals</td>
<td>-</td>
<td>9</td>
<td>10</td>
<td>31</td>
<td>12</td>
<td>62</td>
</tr>
<tr>
<td>Articles</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>Catalogs</td>
<td>-</td>
<td>33</td>
<td>81</td>
<td>44</td>
<td>22</td>
<td>180</td>
</tr>
<tr>
<td>Books</td>
<td>121</td>
<td>57</td>
<td>107</td>
<td>285</td>
<td>146</td>
<td>716</td>
</tr>
<tr>
<td>Manuals</td>
<td>-</td>
<td>2</td>
<td>9</td>
<td>38</td>
<td>2</td>
<td>51</td>
</tr>
<tr>
<td>Maps</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>31</td>
<td>4</td>
<td>39</td>
</tr>
<tr>
<td>Reports</td>
<td>-</td>
<td>15</td>
<td>22</td>
<td>39</td>
<td>39</td>
<td>115</td>
</tr>
<tr>
<td>Profiles</td>
<td>-</td>
<td>1</td>
<td>74</td>
<td>-</td>
<td>-</td>
<td>75</td>
</tr>
<tr>
<td>Monographs</td>
<td>-</td>
<td>3</td>
<td>11</td>
<td>4</td>
<td>-</td>
<td>18</td>
</tr>
<tr>
<td>Journals</td>
<td>-</td>
<td>5</td>
<td>12</td>
<td>20</td>
<td>17</td>
<td>54</td>
</tr>
<tr>
<td>Censuses</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>0</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Calendars</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
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<td>Studies</td>
<td>-</td>
<td>-</td>
<td>88</td>
<td>67</td>
<td>72</td>
<td>227</td>
</tr>
<tr>
<td>Booklets</td>
<td>-</td>
<td>-</td>
<td>88</td>
<td>41</td>
<td>5</td>
<td>134</td>
</tr>
<tr>
<td>Pamphlets</td>
<td>-</td>
<td>-</td>
<td>53</td>
<td>44</td>
<td>22</td>
<td>119</td>
</tr>
<tr>
<td>Newspaper Clippings</td>
<td>-</td>
<td>-</td>
<td>1,475*</td>
<td>1,931*</td>
<td>985*</td>
<td>4,391*</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>-</td>
<td>-</td>
<td>48</td>
<td>132</td>
<td>-</td>
<td>180</td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>606</td>
<td>1,471</td>
<td>1,972</td>
<td>2,169</td>
<td>6,459</td>
</tr>
</tbody>
</table>

* Newspaper clippings not included in total.

Source: FESSC, Final Report, Year V.

6. Internal Development. Following the 1974 flood, the losses at FESSC were established at well over one quarter million dollars. Although this
Figure 21
GROWTH OF ACQUISITIONS
BASIC DATA CENTER-FESSC
1974-79

Units Acquired
6,500
2,000
1,500
1,000
500


241 606 1,471 1,972 2,169 6,459
The project did not provide any funds for the reconstruction of FESSC, the recognition by a foreign sponsor of the capability of FESSC helped them in seeking local, state, and federal funds to rebuild the institution. At present, FESSC is located on a modern campus, and construction of new buildings continues. The internal organization has also evolved as a result of this program. The Department of Research and Development is an important component of the institution and the educational programs are oriented to solving real-world problems. The institution has grown from a student body of 1,200 in 1974 to nearly 4,000 by the end of 1978. Next year, the first class of industrial-chemical engineers will be graduating from the Technology Center as a direct result of this program. The Department of Research and Development is an important component of the institution and the educational programs are oriented to solving real-world problems.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility Studies</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Manufacturing Opportunity Studies</td>
<td>18</td>
<td>14</td>
<td>24</td>
<td>13</td>
<td>14</td>
<td>83</td>
</tr>
<tr>
<td>Case Studies</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Management Guidelines</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Other Studies</td>
<td>-</td>
<td>10</td>
<td>6</td>
<td>12</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>22</td>
<td>28</td>
<td>39</td>
<td>33</td>
<td>31</td>
<td>153</td>
</tr>
</tbody>
</table>

7. Audiovisual Documentation. Five consecutive years of audiovisual documentation are now available as a result of this program. FESSC now has its own audiovisual facilities, and two persons were trained by the OIP staff to continue this work. The FESSC staff is currently experimenting with closed-circuit television teaching techniques as well as videotape.

8. Financial Commitment. From the day of inception of this project, the administration of FESSC has been committed to it; one quantifiable indicator
is the amount of funding that FESSC has provided to match or to complement the AID grant. Table 28 presents this information, and Figure 22 graphically illustrates the favorable relationship between the funds invested in the project by AID and those generated by FESSC, either internally or from other national sources (federal government, state government, national agencies, banks, and many other sources).

In addition to the above funding, during the past two years FESSC also obtained a grant of over 23 million cruzeiros (about $1.2 million at the present rate) to establish the Technology Center on the new FESSC campus.

As has been pointed out, the FESSC staff showed great dedication during the life of this project, and it was they who carried out the bulk of the tasks programmed over the years. Mr. Jose Muller, Counterpart Project Director, and Mr. Humberto Dalsasso, Head of Technical Assistance Services, both appear in Figure 23 representing the many persons involved in this project.
Table 28
DISBURSEMENT OF GRANT AND PROJECT FUNDS
FUNDACAO EDUCACIONAL DO SUL DE SANTA CATARINA (B-427)
YEARS I-V
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Year I</th>
<th>Year II</th>
<th>Year III</th>
<th>Year IV</th>
<th>Year V</th>
<th>Total</th>
<th>Project Total</th>
<th>Years I-V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>FESSC</td>
<td>Total</td>
<td>AID</td>
<td>FESSC</td>
<td>Total</td>
<td>AID</td>
<td>FESSC</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
<td>18,000</td>
<td>16,000</td>
<td>13,000</td>
<td>29,000</td>
<td>17,000</td>
<td>73,789</td>
<td>90,789</td>
<td>19,000</td>
</tr>
<tr>
<td>Travel</td>
<td>4,000</td>
<td>2,000</td>
<td>1,500</td>
<td>3,150</td>
<td>2,000</td>
<td>4,152</td>
<td>4,152</td>
<td>2,360</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>1,500</td>
<td>3,191</td>
<td>4,691</td>
<td>500</td>
<td>2,720</td>
</tr>
<tr>
<td>Contract Services</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Consultants (Local)</td>
<td>4,000</td>
<td>2,000</td>
<td>4,610</td>
<td>6,610</td>
<td>4,560</td>
<td>4,560</td>
<td>4,560</td>
<td>5,000</td>
</tr>
<tr>
<td>Overhead</td>
<td>4,350</td>
<td>4,350</td>
<td>9,456</td>
<td>9,456</td>
<td>1,290</td>
<td>1,290</td>
<td>1,290</td>
<td>3,500</td>
</tr>
<tr>
<td>Other (Publications)</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Participation Ratio:</td>
<td>100%</td>
<td>-</td>
<td>66.6%</td>
<td>-</td>
<td>35.5%</td>
<td>-</td>
<td>35.5%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FESSC</td>
<td>0%</td>
<td>33.4%</td>
<td>-</td>
<td>64.5%</td>
<td>-</td>
<td>57.1%</td>
<td>-</td>
</tr>
</tbody>
</table>

* Includes cost sharing from federal and state governments as well as industry.

Source: Project accounting files and counterpart financial records.
Figure 22

FUNDACAO EDUCACIONAL DO SUL DE SANTA CATARINA
GRANT AND PROJECT FUNDS
1974-79

Source: Table 28
Figure 23
FESSC SENIOR STAFF
(From right to left, Mr. J. Muller and Mr. H. Dalsasso)
This project was initiated out of phase with the rest of the grants and was first funded in late June 1975. Originally it was planned to run through January 9, 1979, but instead was terminated at the end of June 1977.

Some accomplishments resulted from Year I of this grant, as reported in the corresponding end-of-the-year report.\(^1\) Unfortunately, the grantee did not submit the progress reports (quarterly) for Year II and to date has failed to issue a final report for the year ending in June 1977.

During the first year, the grantee reported having provided 53 small-scale industries with technical assistance. They did establish an industrial extension service during that year and opened two field stations -- one each at Ile-Ife and Ado-Ekiti. Two additional field stations were planned for Year II, but there has been no official report on them.

The UI staff reported having completed and published 16 studies on various aspects of small-scale industry development in Nigeria. They also presented two seminars -- one for government officials occupying small-scale industry positions in all of the states of the federation, the other for some 50 small-scale industrialists interested in the problems of that sector.

The project got off to a normal start, and during Year I the UI reported contributing substantial funding to the project as shown in Table 29 and graphically in Figure 24. At the start of Year II (June 25, 1976), the administration of UI was changed; the new administration either lost interest in this project or had other priorities, and project activities began slowing down, coming finally to a halt by March 1977. The grant, therefore, was not continued by the sponsor at the recommendation of the OIP Project Director.

\(^1\) Final Report--Small-Scale Industry Grant, University of Ife, by Nelson C. Wall, published by the Georgia Institute of Technology, Atlanta, Georgia, January 1977.
Table 29
DISBURSEMENT OF GRANT AND PROJECT FUNDS
UNIVERSITY OF IFE (B-455)
Years I-II
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Year I</th>
<th>Year II</th>
<th>Project Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UI*</td>
<td>Total</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
<td>-</td>
<td>133,738</td>
<td>133,738</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Travel</td>
<td>2,490</td>
<td>8,300</td>
<td>10,790</td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>15,770</td>
<td>53,950</td>
<td>69,720</td>
</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Technical Research and Support</td>
<td>4,240</td>
<td>10,790</td>
<td>15,030</td>
</tr>
<tr>
<td>Publications</td>
<td>-</td>
<td>1,826</td>
<td>1,826</td>
</tr>
<tr>
<td>Overhead</td>
<td>-</td>
<td>20,059</td>
<td>20,059</td>
</tr>
<tr>
<td>Technical Equipment</td>
<td>-</td>
<td>47,791</td>
<td>47,791</td>
</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td>276,454</td>
<td>321,454</td>
</tr>
</tbody>
</table>

Participation Ratio:
AID  14.0%
UI   86.0%

* Includes cost sharing from government sources.
** Of the $45,000 grant in Year II, $11,434.87 was not spent and was returned to sponsor.

Source: Project accounting files and counterpart financial records.
Figure 24

UNIVERSITY OF IFE
GRANT AND PROJECT FUNDS
1975-77

*Dollars*

Data not available on counterpart contribution for 1976-77

Source: Table 29

-109-
The Institute for Small-Scale Industries of the University of the Philippines (UP/ISSI) was advised by OIP on February 9, 1976, that this grant had been awarded to them with an effective implementation date of January 10, 1976. UP/ISSI took immediate action to nominate a counterpart Project Director and establish a project staff. Soon thereafter, work was begun to provide working space and related facilities for the Pilot Extension Office at the UP facilities in Tacloban City. The extension office was opened officially to the public on May 12, 1976.

The Pilot Extension Office in Tacloban City has five staff members. As embodied in the original design, extension services comprise the main bulk of the involvement of the extension office in the region. Detailed reports of past activities have been submitted on schedule; consequently, only the more outstanding accomplishments are summarized below.

1. **Appropriate Technology.** In the past three years the UP/ISSI staff has developed, fabricated, and field-tested seven appropriate technology devices. These devices are:

   - Mechanical feed mixer (55-gallon oil drum)
   - Material handling -- wooden cart
   - Simple wood lathe
   - Wood lathe spindle
   - Steel weaving frame
   - Solar dryer
   - Band-saw adjuster

Institutions or persons interested in receiving detailed drawings of these devices may request them directly from the counterpart institution. All of these devices were developed during the provision of technical assistance to the local enterprises.

---

1/ For full details, refer to the respective end-of-the-year reports entitled Final Report--Small-Scale Industry Grant, University of the Philippines, by Nelson C. Wall, published by the Georgia Institute of Technology, Atlanta, Georgia, January 1977 and 1978.
2. **Employment Generation.** As in the case of the other counterparts, one indicator used to determine the positive impact of the new service being provided has been the increase or decrease in the labor force of the serviced firms. The counterpart staff kept records on 29 companies which have received technical-management assistance over the past three years. According to their records, a total of 37 new jobs have been generated as a result of this program. Table 30 presents this information. In addition to the reported figure, UP/ISSI also indicated having generated 78 additional jobs through handicraft skills training programs offered in the past year.

The UP/ISSI staff has reported servicing 83 technical assistance cases in the three-year period, as shown in Table 31. Details of the problems encountered and the solutions implemented may be found in the counterpart annual reports.

3. **Education and Training.** The area of human resources has also been high in priority to the counterpart staff and some achievements can be identified.

Table 32 presents the numbers of persons trained by UP/ISSI during the life of the project.

In addition to the training programs offered to entrepreneurs and others, the staff of UP/ISSI has been receiving special training either at OIP headquarters in Atlanta, Georgia, or in other institutions. Table 33 lists the participants and institutions providing the training.

4. **Research Papers and Publications.** The extension office staff provided information and guidance to the public and private sectors in projects related to the development and promotion of small and medium-scale industries in the region. Research was conducted on subjects either directly related to the inquiry or to the technical assistance cases. As a result, UP/ISSI prepared and published 77 documents in the past three years.
Table 30

VARIATION IN EMPLOYMENT OF MONITORED COMPANIES RECEIVING TECHNICAL-MANAGEMENT ASSISTANCE
UP/ISSI, 1976-79

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Period Monitored</th>
<th>Start</th>
<th>End</th>
<th>Absolute</th>
<th>Variance</th>
<th>Percent</th>
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<tr>
<td>1</td>
<td>1976-79</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>1976-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>1976-79</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>1976-79</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>1976-79</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>1976-79</td>
<td>22</td>
<td>33</td>
<td>11</td>
<td>50.00</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>1976-79</td>
<td>8</td>
<td>11</td>
<td>3</td>
<td>37.50</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>1976-79</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>150.00</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>1976-79</td>
<td>29</td>
<td>29</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>1978-79</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>1978-79</td>
<td>109</td>
<td>129</td>
<td>20</td>
<td>18.34</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>1978-79</td>
<td>14</td>
<td>14</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
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<tr>
<td>17</td>
<td>1978-79</td>
<td>3</td>
<td>3</td>
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<td></td>
<td>-</td>
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<tr>
<td>18</td>
<td>1978-79</td>
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<td>4</td>
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<td></td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>1978-79</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>1978-79*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>1978-79</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>25</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>26</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>27</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>28</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>29</td>
<td>1978-79*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>231</td>
<td>268</td>
<td>37</td>
<td>16.01</td>
<td>-</td>
</tr>
</tbody>
</table>

* Proposed project; business not yet established.
Source: UP/ISSI, Final Report, Year III.
### Table 31

**TECHNICAL ASSISTANCE CASES**

**UP/ISSI, 1976-79**

<table>
<thead>
<tr>
<th>Type of Assistance</th>
<th>1976-77</th>
<th>1977-78</th>
<th>1978-79</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous</td>
<td>15</td>
<td>22</td>
<td>29</td>
<td>66</td>
</tr>
<tr>
<td>Discontinuous</td>
<td></td>
<td>4</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>26</td>
<td>42</td>
<td>83</td>
</tr>
</tbody>
</table>

Source: UP/ISSI, Final Report, Year III.

### Table 32

**SUMMARY OF PERSONS TRAINED**

**UP/ISSI, 1976-79**

<table>
<thead>
<tr>
<th>Type of Training</th>
<th>1976-77</th>
<th>1977-78</th>
<th>1978-79</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiplier Level (Trainers)</td>
<td>-</td>
<td>-</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Entrepreneurial Level</td>
<td></td>
<td>16</td>
<td>28</td>
<td>44</td>
</tr>
<tr>
<td>Industrial Skills</td>
<td></td>
<td>136</td>
<td>20</td>
<td>156</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>152</td>
<td>88</td>
<td>240</td>
</tr>
</tbody>
</table>

Source: UP/ISSI, Final Report, Year III.

### Table 33

**UP/ISSI STAFF TRAINING, 1976-79**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Training Institution</th>
<th>Date</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. U. Alvizo</td>
<td>OIP</td>
<td>July 13, 1976</td>
<td>4 weeks</td>
</tr>
<tr>
<td>T. Vinuya</td>
<td>East-West Center</td>
<td>Sept. 26, 1976</td>
<td>4 weeks</td>
</tr>
<tr>
<td>T. C. Gotico</td>
<td>OIP</td>
<td>Nov. 7, 1977</td>
<td>3 weeks</td>
</tr>
<tr>
<td>L. Abrugar</td>
<td>Technonet Asia</td>
<td>1977</td>
<td>2 months</td>
</tr>
<tr>
<td>C. E. Lee</td>
<td>Technonet Asia</td>
<td>1978</td>
<td>1 month</td>
</tr>
<tr>
<td>R. C. Dakanay</td>
<td>OIP</td>
<td>Oct. 1, 1978</td>
<td>3 weeks</td>
</tr>
</tbody>
</table>

Source: Project Director's records.
Table 34 offers a summary of the publications resulting from this project. Titles of all these documents appear in the yearly reports for the project.

Table 34
SUMMARY OF PUBLICATIONS
UP/ISSI, 1976-79

<table>
<thead>
<tr>
<th>General Classification</th>
<th>Number Published</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1976-77</td>
</tr>
<tr>
<td>Feasibility Studies</td>
<td>17</td>
</tr>
<tr>
<td>Case Studies</td>
<td>3</td>
</tr>
<tr>
<td>Industry Surveys</td>
<td>4</td>
</tr>
<tr>
<td>Project Proposals</td>
<td>5</td>
</tr>
<tr>
<td>Other Studies</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

Source: Project Director's records.

5. Organizational Linkages. Recognizing the need to coordinate the extension office activities with other government agencies in the region, UP/ISSI has developed good working relationships with the following agencies:

- National Economic Development Authority (NEDA)
- Leyte Sab-A Basin Development Authority
- Entrepreneurial Development in General Education (EDGE)
- Small Business Advisory Center (SBAC)
- National Cottage Industry and Development Authority (NACIDA)
- Development Bank of the Philippines (DBP)
- Ministry of Social Services and Development (MSSD)
- Ministry of Agrarian Reforms (MAR)
- Divine Word University (DWU)
- Rural Workers Office (RWO)

Other agencies also have linkages to the project, but the above have been the most active ones in the past few years.

6. Audiovisual Documentation. Three years of audiovisual documentation were completed and are now available to the counterpart. Members of UP/ISSI were trained to continue performing this service in the future.
7. **Financial Commitment.** The administration of UP has shown great interest in this project, but to date its financial assistance has been limited. During November 1978, the Project Director visited Dr. Emanuel Soriano, Executive Vice President of UP, to determine how the project would continue to be funded once the grant came to its programmed end in January 1979. Dr. Soriano at the time assured the author that UP would fund the extension office (at present budget level) for the next year or until other sources are identified.

As shown in Table 35, a total of $139,358 has been invested in this project, of which 96.9% was provided by the AID grant and 3.1% came from UP funds. Figure 25 presents this information in a graphic manner.

The Counterpart Project Director, Mr. Paterno V. Viloria, has been most active in the past three years and has greatly assisted in meeting the project goal. Mr. Viloria appears in Figure 26, together with the author, at a meeting held in Guatemala City.
Table 35
DISBURSEMENT OF GRANT AND PROJECT FUNDS
UNIVERSITY OF THE PHILIPPINES (B-463)
YEARS I-III
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Year I</th>
<th>Year II</th>
<th>Year III</th>
<th>Project Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UP*</td>
<td>Total</td>
<td>AID</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
<td>4,200</td>
<td>-</td>
<td>4,200</td>
<td>9,400</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>5,600</td>
<td>-</td>
<td>5,600</td>
<td>2,900</td>
</tr>
<tr>
<td>Local</td>
<td>1,300</td>
<td>-</td>
<td>1,300</td>
<td>1,300</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>3,300</td>
<td>-</td>
<td>3,300</td>
<td>6,900</td>
</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
<td>20,500</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>8,100</td>
<td>-</td>
<td>8,100</td>
<td>2,000</td>
</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td>-</td>
<td>45,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Participation Ratio:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AID</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UP</td>
<td>0.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Includes cost sharing from other sources.

Source: Project accounting files and counterpart financial records.
Figure 25

UNIVERSITY OF THE PHILIPPINES
GRANT AND PROJECT FUNDS
1976-79

Dollars
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000

1976-77 1977-78 1978-79

48,132 46,226

AID FUNDS
UP FUNDS

Source: Table 35
Figure 26

UP/ISSI COUNTERPART PROJECT DIRECTOR
(Right to left: Mr. P. Viloria and the author)
Much as in the case of Project B-455 (University of Ife), this grant was initiated out of phase with the rest of the program. The Technology Consultancy Centre (TCC) of the University of Science and Technology has been a counterpart institution of OIP since July 1975. When it became apparent to OIP during late 1976 and early 1977 that Project B-455 would not be extended, it was recommended to the sponsor that TCC be initiated into the program, replacing the University of Ife. On May 24, 1977, the sponsor advised OIP that it concurred with OIP's recommendation, and thus UST/TCC became a grantee for an 18-month period, beginning June 25, 1977.

Reports covering the first year of activity and corresponding accomplishments have been submitted to the sponsor on schedule. The balance of this section will highlight some of the achievements attained in the past 18 months.

1. **Appropriate Technology.** It is generally recognized that the most important role of TCC is the transfer of technology from TCC to the small-scale indigenous industries of Ghana. TCC is, therefore, geared to the concept that what is needed is a multitude of indigenous enterprises which progress technically and economically as rapidly as the abilities of the entrepreneur and the available technological, managerial, and financial assistance will allow. Many of the achievements in the area of appropriate technology are not "devices," but rather demonstrative units that are operational and feasible in Ghana. The following listing is representative, but not all evolved during the last 18 months of work.

   o Manufacture of steel bolts and nuts
   o Broadloom weaving
   o Soap plant
   o Sugar pilot plant
   o Brass casting furnace
   o Glass bead manufacturing

---
1/ For full details, refer to the end-of-the-year report entitled *Final Report: Small-Scale Industry Grant, University of Ife and University of Science and Technology*, by Nelson C. Wall, published by the Georgia Institute of Technology, Atlanta, Georgia, January 1978.
o Rubber sheets (latex)
o Lemongrass distillation
o Pyrolysis of sawdust
o Glue manufacturing

These manufacturing units have been discussed in the corresponding end-of-the-year reports, but anyone wishing additional details, drawings, and information may contact the counterpart institution directly.

Due to the indigenous nature of the companies assisted by TCC, it was not possible to keep records on employment generation. The real objective was to help the entrepreneur get started rather than to keep tally on the number of persons employed.

2. Education and Training. As has been indicated, it is not always possible to persuade a local entrepreneur to initiate a new venture. In an attempt to resolve this, TCC has been establishing what it calls "production units." The purpose of establishing these units is fourfold:

(1) To train craftsmen and managers in the skills of a new industry;
(2) To complete product development under production conditions;
(3) To test the market for the product in a realistic way;
(4) To demonstrate to entrepreneurs the viable operation of the industrial activity.

Since 1972, when TCC started operating and setting up "production units," it has concentrated on the first objective of training craftsmen and managers. During the past 18 months, some 91 persons have participated and received a total of 685 months of training. Table 36 presents a summary of this activity.

The training programs offered by UST/TCC represent an average of seven months of training per person. During the entire training period, the participants receive training wages from TCC on the basis of their skills and production.

Also during the life of this project, two members of the TCC staff came to OIP for special training. They were Mr. S. Buatsi (1977) and Mr. P. Donkor (1978). Mr. Buatsi is a metal products designer, and during his three-week stay he gathered information on this subject. Unfortunately, his interest was
in the "lost wax process," for which little information was available. On the other hand, Mr. Donkor was concerned with the manufacture of soap and the extraction of vegetable oil. OIP was able to assist him in gathering information and meeting with manufacturers in the U.S.A.

Table 36
SUMMARY OF INDUSTRIAL TRAINING
UST/TCC, 1977-79

<table>
<thead>
<tr>
<th>Production Unit</th>
<th>Number of Trainees</th>
<th>Aggregate Months of Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadloom Weaving</td>
<td>34</td>
<td>260</td>
</tr>
<tr>
<td>Steel Bolts and Nuts</td>
<td>19</td>
<td>199</td>
</tr>
<tr>
<td>Plant Construction</td>
<td>18</td>
<td>103</td>
</tr>
<tr>
<td>Castor Oil</td>
<td>14</td>
<td>82</td>
</tr>
<tr>
<td>Rubber Project</td>
<td>6</td>
<td>41</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>91</strong></td>
<td><strong>685</strong></td>
</tr>
</tbody>
</table>

Source: TCC project records.

3. Research Papers and Publications. The senior staff of TCC is research oriented. In the past 18 months, they have researched and published 13 documents and studies. The following listing presents these titles for the first time.


- Dr. B. A. Ntim, The Role of the Technology Consultancy Centre in Industrial Development, Paper presented at the ITOG Conference in Indianapolis, Indiana, April 1977.


Dr. J. W. Powell, Appropriate Technology in India, TCC, UST, Kumasi, Ghana, January 1978.


Mr. Peter Donkor, Extraction of Palm Oil Using Appropriate Technology Hand Screen Press, TCC, UST, Kumasi, Ghana, July 1978.

Mr. K. Opoku-Debrah, Traditional Soap-Making (Amonkye) at Wiamoase, Ashanti, TCC, UST, Kumasi, Ghana, April 1978.

4. Organizational Linkages. Overseas support of TCC has been in evidence since the initial phase of the Centre, and the inflow of funds from outside Ghana has been at a record high during the past 18 months. The main organizations linked to TCC are:

- The International Development Research Centre of Canada (IDRC)
- Oxfam, U.K.
- United States Agency for International Development (AID)

Linkages exist with many other organizations, but only the three named are funding research at TCC. At the national level, TCC maintains close linkages with organizations such as:

- State Goldmining Corporation
- State Transport Corporation
- Ministry of Health
- Sugar Industry Board

5. Audiovisual Documentation. As part of the activities under this project, two audiovisual documentations were completed by OIP staff members, assisted by the TCC staff. At present, TCC does not plan to continue this activity because of the lack of equipment, videotape, and other support systems.
6. **Alternative Energy Sources.** Early in 1977, TCC became interested in studying the opportunities in Ghana for utilizing alternative and renewable energy sources. Wood waste as an energy source was the first area of research; as a result, under separate funding, a project was established in connection with OIP and the Building and Road Research Institute of Ghana. OIP designed a prototype pyrolytic convertor to produce charcoal, fuel oil, and heat from sawdust. One unit has been built and is now being tested. Three more units also will be manufactured under this project. All four units will be used by the Building and Road Research Institute to operate a brick kiln.

 Several experimental solar water heaters have been built and are being tested currently. Another area of research in the field of solar energy has been the sun-drying of brewers' spent grain for animal feed. This has been successful, but with the increasing price of grain, it may cease to be financially profitable.

7. **Financial Commitment.** As in the case of the other counterpart institutions, TCC has invested in this program. According to TCC reports, some $135,000 of its own funds have been matched to the grant funds. Table 37 presents this information, and Figure 27 is a graphic presentation of the 18 months' funding.

The Counterpart Project Director, Dr. John Powell, has been of great assistance to the project and has worked closely with the author. Figure 28 shows Dr. Powell at a meeting at OIP headquarters in Atlanta.
Table 37
DISBURSEMENT OF GRANT AND PROJECT FUNDS
UNIVERSITY OF SCIENCE AND TECHNOLOGY (B-492)
YEARS I-II
(in dollars)

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Year I</th>
<th>Year II</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AID</td>
<td>UST*</td>
<td>Total</td>
</tr>
<tr>
<td>Direct Salaries and Wages</td>
<td>-</td>
<td>90,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>3,000</td>
<td>-</td>
<td>3,000</td>
</tr>
<tr>
<td>Local</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>3,000</td>
<td>-</td>
<td>3,000</td>
</tr>
<tr>
<td>Contract Services (GIT)</td>
<td>20,500</td>
<td>-</td>
<td>20,500</td>
</tr>
<tr>
<td>Audiovisual Documentation</td>
<td>2,000</td>
<td>-</td>
<td>2,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>14,500</td>
<td>-</td>
<td>14,500</td>
</tr>
<tr>
<td>Total</td>
<td>45,000</td>
<td>90,000</td>
<td>135,000</td>
</tr>
</tbody>
</table>

|                               | Year I       | Year II         | Total         |
|                               | AID**        | UST*            | Total         |
| Direct Salaries and Wages     | -            | 45,000          | 45,000        |
| Travel                        |              |                 |               |
| International                 | -            | 4,760           | 4,760         |
| Local                         | -            | 1,000           | 1,000         |
| Materials and Supplies        | -            | 2,400           | 2,400         |
| Contract Services (GIT)       | -            | 14,050          | 14,050        |
| Audiovisual Documentation     | -            | 1,000           | 1,000         |
| Equipment                     | -            | 6,890           | 6,890         |
| Total                         | 30,100       | 45,000          | 75,100        |

Participation Ratio: AID 33.3% 40.1% 35.7%
UST 66.7% 59.9% 64.3%

* Includes cost sharing from other sources
**Year II is from July 1, 1978, to January 9, 1979, and includes $22,500 grant plus $7,600 additional from B-455 as authorized by sponsor, for a total of $30,100.

Source: Project accounting files and counterpart financial records.
Figure 27

UNIVERSITY OF SCIENCE AND TECHNOLOGY
GRANT AND PROJECT FUNDS
YEARS 1977-79

* Note: Year I started July 1977

Source: Table 37
Figure 28

UST/TCC COUNTERPART PROJECT DIRECTOR
(Dr. John Powell)
At the end of the fifth year of this project (A-1600), OIP has successfully established four operational counterpart programs with units overseas and had to terminate one additional counterpart program. The two counterparts with five years of participation appear to be fully dedicated to the basic concept of generating employment and assisting small-scale industries. The other two counterparts, with three or fewer years, are fully operational and equally dedicated. All four counterparts are now capable of operating with minimal technical support from outside sources and have proven their ability to implement pragmatic action programs.

OIP had two main functions under this program:

1. Training of selected counterpart staff both on site and in the U.S.A.;
2. Provision of on-site consultative services to the different programs implemented by the counterpart institutions.

Both of these functions have been carried out under the program.

1. Training of Counterpart Staff. Over the past five years, the OIP staff has presented special training programs for selected members of the counterpart staffs. These programs, presented in Atlanta, Georgia, have attempted to enhance the capability of the counterpart staffs to deal with "real-world" problems common to small-scale industries. The training programs were carried out in various forms as appropriate, including classroom activities, on-the-job training, guidance, consultation, industrial tours, and general business contacts, as needed. They also were planned to allow the student to participate in the training activity and develop his research capability. Table 38 lists the counterpart participants trained at OIP.

A total of 16 persons participated in these special training programs at OIP, and some 69 weeks of instruction were offered to these participants. At the same time, the OIP staff presented on-site workshops, lectures, and seminars to the counterpart staffs. These were reported on a year-by-year basis in the respective final reports.
Table 38
COUNTERPART STAFF TRAINED AT OIP, 1974-79

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Year</th>
<th>Duration of Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hae Byung Lee</td>
<td>SJU</td>
<td>1974</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Jae Bok Yoon</td>
<td>SJU</td>
<td>1974</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Clarence Prince</td>
<td>SJU</td>
<td>1974</td>
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<td>P. Donkor</td>
<td>UST/TCC</td>
<td>1978</td>
<td>3 weeks</td>
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</table>

Source: Project Director's records.

2. On-Site Consultation. Since OIP had the responsibility of providing on-site consultation and technical support to the counterpart staff members, in the past five years a substantial number of staff man-hours were served overseas. Table 39 summarizes this on-site staff support. As shown, 91 visits were made by OIP staff members to the five counterparts during the life of the project.

3. Information Service. As part of the assistance provided to the counterpart institutions, the International Development Data Center (IDDC) of OIP was made available for specific requests. As the counterpart staff members provided technical assistance, they would address specific requests to IDDC for information on technology, state of the art, background data, appropriate techniques, or other aspects. On an average, the IDDC staff spent two days per month per counterpart institution obtaining the requested information. When staff members of the counterpart institution came to OIP for special training, they used IDDC freely, and much of their research was conducted there.
### Table 39
SUMMARY OF OIP ON-SITE STAFF SUPPORT, 1974-79

<table>
<thead>
<tr>
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<th>Institution</th>
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<td></td>
<td>SJU</td>
<td>April 3-April 10, 1974</td>
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<tr>
<td>H. Eller*</td>
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<tr>
<td>B. James</td>
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<td>SJU</td>
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<td>June 28-July 6, 1974</td>
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<td>April 27-May 8, 1978</td>
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<td>July 2-July 14, 1978</td>
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<td>December 7-December 21, 1978</td>
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</tbody>
</table>

* Funded under separate AID grants and contracts.

Source: Project Director's records.

4. Research Papers and Publications. Many of the studies published were cosponsored by another AID grant (211-d), so it is not appropriate to mention
them as resulting from this project only. Under A-1600, the following publications were issued: SJU, five annual reports and one baseline study; FESSC, five annual reports and one baseline study; UI, two annual reports and one baseline study; UP/ISSI, three annual reports and one baseline study; and UST/TCC, two annual reports. All of these publications were submitted on schedule to the sponsor and circulated to the participating counterparts.

5. Audiovisual Documentation. In the past five years, OIP has developed an audiovisual documentation capability and it presently has the necessary equipment to go on site and tape audiovisual records. A total of 17 audiovisual documentations were performed over the life of the project -- five each at SJU and FESSC, three at UP/ISSI, and two each at UI and UST/TCC. Counterpart staff members were trained to continue with this activity once the project reached its programmed termination. All of the audiovisual material has been submitted to the sponsor and to the participating counterparts.

6. Use of Grant Funds. As designated by the sponsor, OIP and the Georgia Institute of Technology were responsible for the administration of grant funds under Project A-1600. OIP served as the administrator of the program and was responsible for the use of the individual grant funds. Table 40 outlines disbursement of grant and project funds for each participating institution over the past five years. As may be noted from Table 40, AID invested a total of $837,574 (51.94% of total) and the counterpart institutions report investing $774,917 (48.06% of total) for a total funding of $1,612,491. Accounting records are available to the sponsor at both OIP and the Office of Contract Administration of the Georgia Institute of Technology.
Table 40
DISBURSEMENT OF TOTAL GRANT AND PROJECT FUNDS
ALL COUNTERPARTS
(D-426, B-427, B-455, B-463, B-492 and A-1600)
YEARS I-V
(in dollars)

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*Includes cost sharing from other sources.
(a) SJU (B-426) grant and project started January 10, 1974, and ended January 9, 1979.
(b) FESSC (B-427) grant and project started January 10, 1974, and ended January 9, 1979.
(c) UP (B-455) grant and project started June 25, 1975, and ended May 24, 1977.
(d) UP (B-463) grant and project started January 10, 1976, and ended January 9, 1979.
(e) GIT (A-1600) grant and project started January 10, 1975, and ended January 9, 1979.
(f) GIT (A-1600) grant and project started January 10, 1975, and ended January 9, 1979.
(g) Of the 945,000 grant for Year II, $111,434.87 was not spent and was returned to sponsor.

Source: Project accounting files and counterpart financial records.
The objectives of this program were defined by the sponsor as follows:

1. To encourage selected developing country organizations to focus on employment generation through programs which accelerate the expansion of existing industry and the creation of new small industries;

2. To demonstrate and document the impact of alternative approaches to the stimulation of small industry; and

3. To create in the appropriate governmental, industrial, and financial sectors of small industry an awareness of potentials and ways to maximize these potentials.

The counterparts selected to participate were institutions in developing countries that were seeking a larger role in solving "real-world" relevant problems associated with the socioeconomic climate of their countries. All had a problem-solving motivation, some manpower and technology, but all were seeking pragmatic know-how. They shared five basic problems associated with the development of small-scale industry:

1. Lack of an organized plan to provide research, service, and information applicable to small-scale industry;

2. Insufficient funding to expand or initiate industrial assistance activity;

3. Need for training of organization staff personnel;

4. Lack of knowledge of practical methodologies;

5. A limited (or deficient) information base related to technical-management problems of small-scale industry.

The program that has just been completed has served as a demonstration to prove that an organization with long-established expertise in the small industry development field can provide training in organization, technical and consulting assistance to counterpart institutions that will enable them to effectively carry out programs of assistance to small industries and generate employment.

The program implemented by OIP had four basic elements:
1. An organized focus with clearly defined aims for each counterpart.

2. A well-trained and motivated staff.

3. An information base.

4. A technical assistance "delivery system," operating on site.

At the initiation of the project, OIP and the counterparts conducted baseline studies of industry status in the target areas. These studies included industrial employment, number of plants, demographic data, industrial financing organizations, profile of counterpart organization, and other appropriate information. These data have served as a "benchmark" for the yearly reports and performance evaluations in trying to determine the success of the project.

On a yearly basis, the sponsor has received individual progress reports on the counterpart projects. On three occasions during in-depth reviews of a companion grant (211-d), these projects also have been informally reviewed with the sponsor.

The anticipated end-of-the-project results were that the activities conducted under this project would result in the establishment of units in developing countries specifically oriented to the generation and expansion of small-scale industry. These units also would generate action-oriented programs of research, service, technology transfer, and industrial training. Further, it was anticipated that over a period of time results would include the expansion of existing companies, the creation of new small-scale enterprises, and the generation of new jobs, with the corresponding beneficial effects on income level and distribution. The bulk of this work was to be carried out in rural areas in order to benefit the low-income regions of the host nation.

The OIP administration conducted a limited evaluation during the last quarter of the fifth grant year, for which purpose the author visited each of the participating counterpart institutions for a period of some 10 days each. The factual information gathered about what had happened will be used as a management tool for improving planning and implementation of future activities.

In conducting these evaluations, the author sought to obtain answers to three basic questions:
1. **Effectiveness.** Had the targets and purposes been achieved?

2. **Significance.** Will these achievements contribute to the economic development or other end-of-the-project goals? What side effects occurred?

3. **Efficiency.** Did the achievements justify the investment, or could the project have been implemented at a lower cost?

It is possible that the sponsor may wish to conduct a more in-depth evaluation of this project at a later date; if so, the author is certain that the findings of the sponsor will be of great value in future decision making regarding programs and projects of this type.

During the final on-site visits by the author, the Counterpart Project Directors were asked to prepare short critiques of the project and their personal evaluations. These critiques are reproduced below in the same order and format as they were received.

* * *

**TECHNOLOGY CONSULTANCY CENTRE**

**A REVIEW OF THE SMALL SCALE INDUSTRY DEVELOPMENT PROGRAMME WITH GEORGIA INSTITUTE OF TECHNOLOGY**

**JULY 1977 - DECEMBER 1978**

**Historical**

The association between the Technology Consultancy Centre (T.C.C.) and the Office of International Programs (O.I.P.), Georgia Institute of Technology began in 1975 as a linkage under the USAID 211D funding programme. During the first two years, the association resulted only in exchanges of visits, publications and correspondence. However, in July 1978, it was possible to embark on a joint programme of work when a Small Scale Industries Development Programme (S.S.I.D.P.) was transferred from Nigeria. This programme made available funds of $45,000 per annum for eighteen months of which the T.C.C. received half and the O.I.P. received half. Five small-scale industry projects of the T.C.C. were selected for promotion under the programme.

**Associate Residency Program in Industrial Extension**

This programme is run at Georgia Institute of Technology and provides a three week training programme including lectures and field experience in industrial extension. Two T.C.C. Research Fellows were sent on the programme under the S.S.I.D.P. They were Mr. S. Buatsi (1977) and Mr. P. Donkor (1978). Mr. Buatsi is a metal products designer working on a project with a rural lost wax casting industry. His experience in Georgia was useful in a general context but not in relation to his specific project under the S.S.I.D.P.
Mr. Donkor's work is with the soap industry and vegetable oil extraction. His experience in Georgia was both generally interesting and of specific relevance to his project under the S.S.I.D.P.

On the whole the Associate Residency Program in Industrial Extension was useful to the T.C.C. and helpful to its small industry projects. However, the cost was borne out of the T.C.C.'s half of the programme funding and hence diminished the funds available for project work in Ghana. It would have seemed more appropriate if the O.I.P. had carried the costs of the training in Georgia from its half of the programme funding.

Other O.I.P. Activities

It has to be placed on record that from the T.C.C.'s point of view it received very little support from O.I.P. for its small industry projects in Ghana. Several O.I.P. staff visited Kumasi during the period under review but these were mostly concerned with general discussions and collecting data using audiovisual techniques. The T.C.C. requested literature searches, back-up research in Georgia and visits to Kumasi by practical specialists to work on projects with Ghanaian staff. None of this support was forthcoming until the visit by Mr. Frank Malvar in October 1978. Malvar brought useful literature and examples of small, manually operated agricultural tools. He might have contributed to the development of agricultural implements for local manufacture had it not been for the critical stage reached on the pyrolysis project. As it was, Mr. Malvar spent four weeks working on the pyrolytic converter during which he made a significant contribution to its development. It is regretted that this one opportunity to involve an able Georgia Engineer in the S.S.I.D.P. was missed and the whole eighteen months passed without any such contribution from the O.I.P.

Recommendations

The experience of the S.S.I.D.P. suggests a number of recommendations for the planning of future projects.

1. Short visits of less than two weeks are of little value to institutions in African LDCs. They may even be counter-productive in diverting senior staff time from project work. Visits should be long enough to enable a practical input to be made such as supervision of the construction of a prototype device, the field testing of such a device or the training of local technicians in a new technique or product manufacture. Such tasks can seldom be accomplished in less than 3 months and can take up to 2 years or more.

It is preferable for a linked institution to have a permanent representative attached to the staff of the institution in the LDC. This was done by Virginia State College during its 211D link with U.S.T. Staff members from V.S.C. spent one or two years in Kumasi and usually overlapped to ensure good continuity. By these means, a real meaning is given to shared development projects with an effective input coming from the American University.
2. Supporting research resources should be provided at the American University. Practical problems of a complex or fundamental nature could often be solved more quickly in America where facilities are better and staff are more specialised in their knowledge and experience. This supporting effort should include laboratory experiments and engineering development as well as literature searches and report writing. The T.C.C. was expecting such support during the S.S.I.D.P. and referred several problems to O.I.P. concerned with lost wax casting of non-ferrous metals, the extraction of vegetable oils and the design of man-powered village industry equipments. As recorded above, the response was long delayed and involved only literature and samples of commercial models of corn sheller, cassava grater and palm kernel cracker. Adaptations of designs suitable for local manufacture in Ghana would have been much more useful.

3. The courses in industrial extension provided at Atlanta were the single most useful part of the S.S.I.D.P. for the T.C.C. These might have been even more useful if they had been longer and included on-the-job experience preferably in another LDC. Ideally such courses should be mounted in India or the Philippines where the African extension worker could see a wide range of relevant intermediate technologies in everyday use.

4. The last recommendation concerns a less tangible factor and is more difficult to define. It relates to a perceived reluctance on the part of O.I.P. to address itself to real issues and problems of immediate significance to economic development in Africa. There is no doubt that O.I.P. has had a greater involvement with Asia and Latin America and that in these areas its consultative approach may be appropriate to the needs of the people. However, to be effective in Africa, a much deeper involvement is required. Advice, as such, is seldom heeded and guidance needs to be given. Whereas, in Asia and Latin America, development can be seen to be proceeding, albeit slowly and in the teeth of population growth, in Africa the key to progress has yet to be discovered. The challenge of Africa requires a sterner attitude and a more profound involvement on the part of institutions who seek to be involved in its development. These recommendations have been drafted with this in view.

3rd November, 1978

DR. J. W. POWELL
DIRECTOR

Author's Note to the Critique Presented by the UST/TCC

The critique presented by UST/TCC fails to recognize the limitations of the small-scale industry grant. The sponsor determined beforehand the scope of work to be implemented under the grant and all potential grantees were made aware of this. More specifically, the author wishes to note the following points:
1. **Funding.** The grantee was allocated $45,000 per year, so for an 18-month program a total of $67,500 should have been made available. Instead, OIP recommended an increase of $7,600, bringing the total to $75,100; the sponsor approved this additional allocation of funds required to complete the program of work. It is true that the cost of travel and per diem were borne by the grantee as established by the grant document, but it is also true that the grantee had some additional funding to assist in supporting its program. Two other grantees in this program received only the base grant and no additional funds, as shown in Table 40.

2. **Training.** A senior representative of the grantee institution was advised of the fact that it would be difficult to find a "rural lost wax casting industry" in Georgia for their staff member to visit. When Mr. J. Buatsi visited OIP in 1977, he (a) interacted with a mechanical engineer specializing in casting, (b) was taken to a number of foundries in the area, and (c) was assisted in conducting library searches on the subject.

3. **Technical Support.** The literature searches requested by the grantee were conducted and information was forwarded on the following subjects:

   - Investment casting (lost wax)
   - Manually operated sugarcane crusher
   - Soap manufacturing (oils)
   - Solar water heaters
   - Food processing
   - Briquetting machines
   - Manually operated nutcrackers
   - Cassava grinders

   There is no doubt that it would be desirable to be able to provide on-site staff on a year-round basis, but as has been pointed out, the grant funds could not support more than three to four man-months of professional time (including travel) per year.

   A more detailed response has been submitted to the sponsor by the OIP administration.

   * * *

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Office of the Director

Mr. Nelson C. Wall  
Associate Director  
Office of International Programs  
Engineering Experiment Station  
Georgia Institute of Technology  
Atlanta, Georgia

Dear Mr. Wall:

We were pleased to learn that you share with us the importance of the UP/ISSI Pilot Extension Office, the Institute's answer to the government's call for regional development. The establishment of the PEO in Region VIII (Eastern Visayas Region) is in consonance with the present drive of the government to develop appropriate small and medium industries in regions outside the Metro Manila area. It delivers the type of service to the small industrialists in the Visayas and Mindanao regions that cannot be effectively delivered by the Institute by reason of geographical location.

The only constraint in the continuance of the satisfactory performance of the PEO is its being phased out by 1979 because funding from the USAID through GIT will be withdrawn at the end of 1978.

Much as we dread the termination of funding from USAID, we have already started exploring the possibilities of obtaining funding from other sources. However, we still hope and look forward to the support of the USAID in this project. In fact, we have submitted to the USAID, Manila office a letter requesting for another grant so that the UP Pilot Extension office may continue its on-going development programs in Region VIII. (Copy is attached).

We sincerely hope you will favorably recommend to the USAID the continuance of the funding for this project.

Very truly yours,

Editha A. Reyes  
Officer-in-Charge

Attached: a/s
November 17, 1978

TO : Mr. Nelson C. Wall
    Associate Director
    Office of International Programs
    Georgia Institute of Technology
    Atlanta, Georgia

FROM : Redentor C. Dakanay
      Officer-in-Charge
      Pilot Extension Office
      Tacloban City

RE : The Pilot Extension After Three Years

Critique:

The Pilot Extension Office's existence in Tacloban City has entirely made the five provinces of Region VIII move ahead in small-scale industries development than it had been many years back. Several newly opened and existing enterprises have been assisted technically to some extent and had also been helped solve some of their business problems. Of course, no amount of financial capacities have been given to them by the Institute but would-be entrepreneurs were made to feel that they were being supported and guided in some other aspects along the line in making their project proposals a reality. For ISSI also prepared for them project feasibility studies with a high percentage of bank's approval when submitted as compared to other agencies involved in similar functions here in town. By improving their processes, methods of work and management through consultancy extended by the staff members of the ISSI, it can be said that more people had been given employment. More income generating projects have cropped up too with the different programs it had implemented.

Different linkages with other government agencies were made possible aside from the self-project generation conducted by the extension office. The ISSI has enabled other offices' unmoved or inactive services to become extra useful the fact that the PEO never stops identifying, and pinpointing prospects for assistance that could possibly be helped by these other agencies who are more expert or knowledgeable on the line. In other words, this one thrust of the PEO is very unique and does a lot of good works to the region.

ISSI is right in adopting personalized monthly visits to clients in the various parts of Region VIII to follow-up on their progress and see for them their undefined problems. Not all interested potential proponents can come to the office where it is presently based, however, because of distance barrier. Not all of them have the courage to come to the office and say for themselves the things they want to say because not all of them are endowed with talents and proper education. These things do make gaps between the officer and the clients, and therefore, this thrust is a good implication on behalf of the program.
In this connection, GIT has made it a point to meet every possible needs of the PEO. Its funds have enabled the ISSI to perform its task beyond par. To enhance the office's credibility for extension works, GIT has sent every staff to attend training, seminar and workshop here and abroad. Much needed advices were provided by its pool of consultants who shared their expertise with the staff. It has financed all these activities and all other expenses incurred in the making of the whole program a success.

Definitely, the task is big and the time is short, but no matter what its factors are, the extension's motto will always prevail, "The Greatest Gift We Can Give To Our Fellowmen Is To Help Them Help Themselves."

Redentor C. Dakanay

* * *

SOONG JUN UNIVERSITY
1-1 Sang-Do 1Dong
Seoul, Korea 151

December 1, 1978

Dr. Joseph M. Pettit,
President,
Georgia Institute of Technology
Atlanta, GA. 30332

Dear Dr. Pettit:

Since 1974, as you would recall, our Soong Jun University and your Georgia Institute of Technology have jointly carried out AID-funded small industry development project in accordance with the principle and spirit of an agreement made between our two institutes in July, 1973.

As our annual reports clearly indicate, accomplishments we have jointly achieved in the last five years are too numerous in kind to list down on this limited space. Besides economic aspects of our achievement in terms of employment generation through stimulation of small industry in Korea, I would like to point out that your academic as well as technical assistance through Office of International Programs has brought to our university an enormous impact in developing industrial extension service programs, adaptive technology, a new department of industrial engineering, and so forth. I want you to know that our university enjoys an unprecedented reputation among academic as well as business communities as a pioneer of "university-government-industry cooperation movement."

We wish to strengthen further our relationship beyond AID-funding project which we understand will be terminated at the end of this year.

Once again, on behalf of trustees, faculty members and staff of Soong Jun University, I sincerely express my hearty thanks to all of you for the services and assistance given to us over the years.
We wish you a Merry Christmas and a Happy New Year.

Sincerely yours,

Bum Soe Koh, Ph.D.
President

c.c. - Mr. Ross W. Hammond
Mr. Nelson C. Wall

* * *

FUNDACAO EDUCATIONAL DO SUL DE SANTA CATARINA

Tuabrao-SC (Brasil), December 18, 1978.

MEMORANDUM

From: Econ. Jose Muller/FESSC
To: Eng. Nelson C. Wall/GIT

Subject: Small-Scale Industry Assistance Program - Benefits generated to FESSC during Grant Periods 1974-1978.

The Small-Scale (micro and units of production non-formally organized) Industry Assistance Program, systematically carried out by FESSC in the period 1974/78 - and operated by non-systematically action since 1969 - meant to FESSC, besides other, the following benefits:

- The implementation of organized technical pragmatic action, and more effective, of FESSC (in grant period) concerned to the integration between Science and Technology as well as to the University and the Real World of Work either concerning FESSC and the Enterprise, or FESSC and the Community and Government.

- The generation of significant products, in direct benefit to the industry, to the social and economic development of the community of South Santa Catarina, always considering the basic philosophy of FESSC which result in the technical-pragmatic objective of the institution and of the regional development. Therefore, of 295 assistance cases to industries carried out during the life of the program and generation of 4,500 new jobs in these companies result in a dollar investment of about $100.00 per new job and this assures FESSC that the technical assistance is desirable. South Santa Catarina has been transformed into an area of "Special Programs" by both the Federal and the State Government. And this occurred as the direct result of the studies and research conducted by FESSC, the
State Planning (Terms of Reference) and the promotion by the Government for the implementation conducted by FESSC. This implementation was aimed at assisting Government, local enterprise, and the community through the provision of scientific analysis of the existing situation and alternatives for the development of the region. The program resulted into a dynamic action with FESSC as the catalytic agent and co-executor of the activities. These programs directly or indirectly implemented by FESSC contributed to the recognition of the institution as a "Regional Developer."

Another activity may be considered is the generation of support systems to other actions such as research, development, public administration, and investments, to name a few. These actions resulted directly in the conception, design, and implementation of the Technological Center "started in 1978." The center received highest priority and the institution consolidated its resources to create a center to provide technical training, implementation of technology, contractual programs and research programs all focusing on development testing, adapting and disseminating technology. This concept is basic in the economic development and technological education of this region in Brazil. In the same manner, thanks to the direct participation of our professional staff and students, a significant amount of new courses have evolved and are being considered or implemented by the institution.

Another achievement may be considered the growth of our human resources following the process of "Theory-Practice-Theory." Through this the staff has developed and the institution has a better potential for self-support "economic-financial." Thus FESSC has developed into a university nucleus and will continue to operate under the objectives of "Science-Technology-Education-Development."

There has been an increasing relationship with similar institutions "Scientific Community-Technological-Educational-Development Agencies." Not only in Brazil but in other parts of the world. As the result FESSC now has a leading position within the State (there are 18 other Educational Foundations and 1 Federal University) not only as producer of applied research, consultant, and training but also as a strong link in the chain of national development.

Outlining of the concept based on the backbone of "technology-economy" and "social-economy" as the nucleus of the FESSC activities in the Region and in the Country focusing on appropriate technology, alternate sources of energy and rural industry.

Through the utilization of outside financial resources (USAID, SUBIN, BBSA) together with technical assistance from Georgia Tech, FESSC was able to assist enterprises and the community. These enterprises there are extremely small and lacking formal management, funding, and technical know-how together with the small communities also lacking these resources became the clients of FESSC. Because these are small industries and small communities they are unable to support the cost of this service and only through the use of outside funding was FESSC in a position to implement these actions.
The outside funding generated by this program permitted FESSC to develop itself, create the Technological Center, acquire the information for the Basic Data Center and many other actions. All of these have greatly enhanced FESSC and through them the institution is now in a position to better serve the region.

These highlights all resulted through this program and on behalf of the staff and FESSC we wish to thank the sponsors.

Sincerely,

Econ. Jose Muller, Director
Research and Development Department

* * *

The critiques presented by the counterpart project directors are self-explanatory and need no further comment. The author's overall evaluation of the program follows below:

1. **Effectiveness.** The targets established for the project have been met. At least 5,100 new jobs have been generated by this program, some 8,000 persons have received industrial training, and over 500 small-scale industries have received technical-management assistance during the life of the project. Many other goals have been achieved; some of these were not considered initially when the project was designed. Many of the by-product achievements are highly important and will have long-term impact on the target areas.

The participating counterparts are now capable of continuing these services, and it is now up to local governments to assist them in their funding needs. The process has been documented, and all counterpart units have had the opportunity of field-testing their individual alternative approaches to the stimulation of small-scale industry.

2. **Significance.** There is no doubt that these achievements will contribute both directly and indirectly to the economic development of the host nations, with one limitation -- the magnitude of the achievement. In order to achieve a national impact, these programs would have to be implemented nationwide in host countries; thus, instead of generating 8,000 jobs, several hundreds of thousands of jobs would be generated. This sort of impact is desirable, but is not always possible to bring about.
3. Efficiency. It is difficult to determine whether the achievements justify the investment required to produce them since so many of the achievements are not presently quantifiable. For example, the establishment of the Technology Center at FESSC and the generation of a number of appropriate technology devices may, over the next 10 or 20 years, have great multiplier effects. However, such results are presently not quantifiable. Had several counterparts been in existence in each of the participating nations, some travel costs could have been reduced and personnel time better planned.

Underlying this summary evaluation is the basic recognition that much of this project work was experimental in nature, and as such cannot be expected to produce only measurable outputs. There is no doubt that the inputs produced the intended outputs; the author believes also that the greatest single accomplishment resulting from this five-year program may well be the fact that several of the participating counterpart institutions now are capable of developing their own methods and techniques in such areas as research, technology transfer, and appropriate technology. Through participation in the project, they have established their own technological expertise and are beginning to break away from the old process of importing technology.

The problem continues to be that in most LDCs there is no effective mechanism to provide the technical-management assistance required by small-scale enterprises. Through this program it was possible to demonstrate that an LDC can participate with a developed country in developing its own indigenous technological capability and that this can be accomplished through mutual agreement between two peer institutions. It appears to the author that this program established a mechanism capable of developing "centers for small-scale industry development" in LDCs.

The counterpart institutions have developed their own extension-type services and provide this service to a network of small-scale enterprises in their regions. The participating institutions are currently providing technical-management consulting services as well as bookkeeping, accounting, manpower training, and many other services which are necessary for the viability of small-scale and mini-industries. Because the selected counterparts are affiliated with or located within an educational institution, they already have engineering, marketing, economic and management know-how, as well as library and information support -- all of which are also available to the small-scale industries being assisted.
The OIP served as the U.S. institution responsible for providing technical support services, training, and experienced personnel to assist the counterparts. During the development stage, OIP provided the following general services:

- Served as a training center for counterpart staff members selected to establish similar programs in their native countries;
- Collected data on small-scale industry development for a wide variety of applications;
- Served as a collection/distribution center for appropriate technology and general industrial data;
- Performed limited research and development upon request from participating institutions; and
- Imparted operational know-how to the LDC staffs by participating with them on site.

The counterparts are now capable of providing most of the services listed above with their own staffs, and it is hoped they will continue to do so for many years. In summary, the program was most worthwhile in both engineering and pragmatic technical assistance. It has proven itself, and in the process produced a large number of measurable results, all within the program objectives and goals. It is the conclusion of the Project Director that the results attained to date surpass those initially conceived by the program.

In view of the above evaluation and conclusions, the question now is, "How best can the experience and results generated by this project be replicated so as to maximize the development of indigenous capabilities in developing areas, especially "the poorest of the poor" countries?" A number of recommendations can be made.

**Recommendation No. 1.** Continue the small industry grant mechanism to include a new set of counterpart organizations in the poorest countries of the world.

**Recommendation No. 2.** Support and assist the establishment of centers for small-scale industry and rural development in developing nations.
Recommendation No. 3. Promote interchanging of personnel and programs among industrial research institutes in developing countries.

Recommendation No. 4. Support continuing research into the process of industrialization.

Recommendation No. 5. Support U.S. institutions that are creating and developing engineering and management technology for developing nations.

Recommendation No. 6. Assist research institutions in developing countries that are affiliated with U.S. counterparts.