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Second Annual Report

EMPLOYMENT GENERATION THROUGH
STIMULATION OF SMALL-SCALE INDUSTRY

211(d) Grant Year: February 23, 1974 - February 22, 1975

Prepared for
Agency for International Development

Georgia Institute of Technology
Atlanta, Georgia 30332

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211(d) Annual Report
Date due: April 22, 1975
Date submitted: April 22, 1975

Grant Title: Employment Generation through Stimulation of Small-Scale Industry (Institutional Grant AID/csd-3175)
Grantee: Georgia Institute of Technology
Grant Program Director: Ross W. Hammond, Industrial Development Division, EES
AID Sponsoring Technical Office: Technical Assistance/Office of Science and Technology

STATISTICAL SUMMARY

Period of Grant	February 23, 1973 to February 22, 1978
Amount of Grant:	\$800,000
Expenditures for Report Year:	\$182,000
Accumulated:	\$312,237
Anticipated for Next Year:	\$177,000

NARRATIVE SUMMARY: Georgia Tech 211(d) Program

EMPLOYMENT GENERATION THROUGH STIMULATION OF SMALL-SCALE INDUSTRY

The primary objective of this two-year-old program is to strengthen Georgia Tech's demonstrated capability in employment generation through the expansion of the small industry sector. This capability is particularly relevant to massive unemployment and rural-to-urban migration problems in many developing countries. The program is integral to the institutional commitment to international education and development.

Activities during Grant Year One included organizational staffing and start-up of the program, the initiation of a small industry data center, the establishment of counterpart relationships with six organizations in developing countries, ten field trips to developing countries, the development of applied research studies relating to small industries, the design of a master's curriculum focused on industrialization, a series of international development seminars, and the maintenance of communications with many international development and linkage organizations. Five published reports and three published papers, as well as two informational brochures, were produced.

During Grant Year Two, the preceding activities were fully implemented and expanded and new activities were generated. The counterpart relationships became more operational and considerable interaction developed. Separately funded but related projects with two counterparts (Soong Jun University in Korea and the Fundacao Educacional do Sul de Santa Catarina in Brazil) were initiated. Twenty-four field trips were made by 211(d)-associated personnel.

The International Development Data Center, established under the program, doubled its small industry information holdings and responded to many internal and external requests and inquiries.

Ten research reports, as well as an industrial extension guideline series (covering 13 subject areas), a monthly newsletter (covering new data acquisitions), and two conference-presented papers were published as products of the 211(d) program.

The master's program in industrialization was activated in September 1974 and is ongoing. New courses were developed and presented. A training program was developed and prepared for field testing. Eight international development seminars were held in Atlanta, and 13 conferences and seminars elsewhere were participated in by 211(d) program staff.

One External Advisory Committee, two Internal Advisory Committee, and 16 staff coordination meetings were held during the year. In addition, the AID recommendations (minor) stemming from the 18-month AID review of the program were implemented by Georgia Tech.

DETAILED REPORT

I. GENERAL BACKGROUND

One of the massive problems faced by many developing countries is high unemployment and underemployment. In addition, most of these nations have large numbers of young people in their population makeup. These young people are now, or shortly will be, joining the labor force, compounding the existing unemployment and creating more severe pressures for job generation.

An associated and difficult matter in many of these countries is the continuing rural-to-urban migration, generated in part by the quest for employment opportunities.

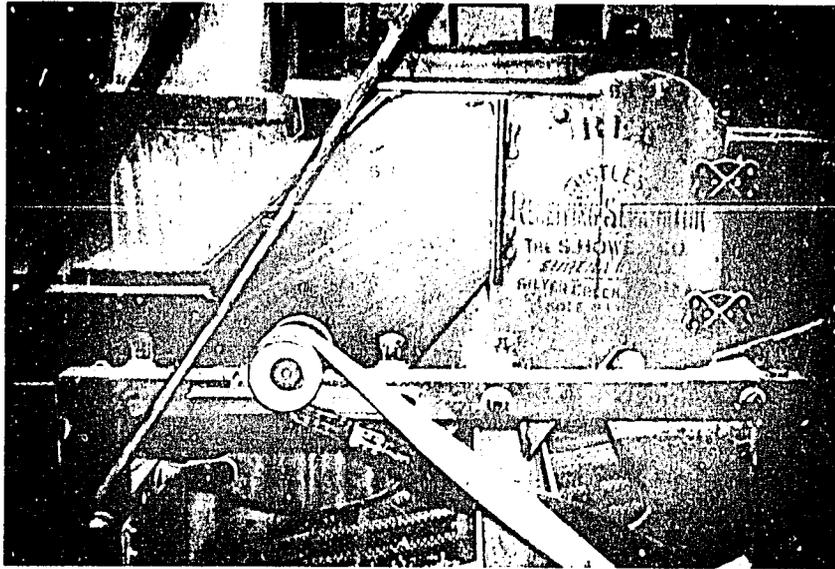
One of the approaches which can be used to ameliorate these and other developing country difficulties is the generation of industrial activities in the rural areas. Such industries could create employment opportunities and new income in the rural areas and, conceivably, reduce the population migration to the urban centers.

There are, of course, difficulties and inhibiting factors connected with rural industrialization. Rural industries tend to be small in size, unsophisticated in technology, limited in markets, hamstrung by inadequate capitalization and lack of access to technology, and unresponsive to factor changes. The owners tend to be self-made entrepreneurs with little education or managerial training. The rural areas frequently lack the infrastructure which industry needs.

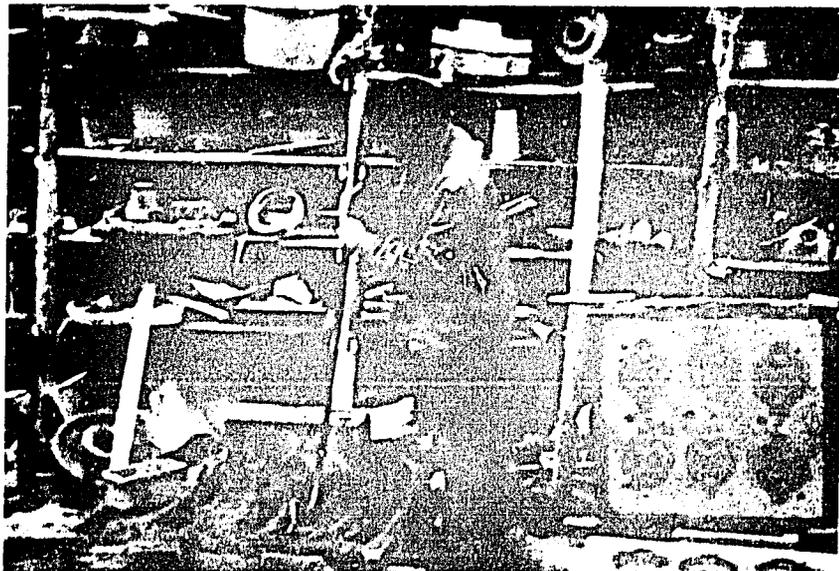
The small industry segment in many developing countries tends to be owned by nationals, whereas the medium-size and large industries tend to be foreign owned. Hence, there is merit from the viewpoint of the home government in insuring that a viable small industry sector exists. Many governments have recognized this and developed programs to encourage this type of industry.

Moreover, small-scale industries tend to be numerous, diversified as to product, and marginal in profit-making capability. They are too small to support staff specialists who could solve many of their relatively simple problems of management, manpower, training, purchasing, production, and sales. Indeed, specialists in these fields are in short supply in most developing

ECUADOR



Twenty-five-year-old equipment at flour mill with cattle feed by-product in Quito, Ecuador. In spite of need for modernization, this stable 14-employee plant competes successfully in the Ecuadorean market.



A Quito, Ecuador, bronze, brass, and iron foundry. Problems include the need for capital for production casting lines and inadequate machine shop space. Utilizing scrap metal primarily, castings are poured twice a month.

countries, and generally would not be available even if the rural industries could support them.

II. PURPOSE OF THE GRANT

It is with this difficult small industry area that Georgia Tech presently is concerned in its international development activities. The Georgia Tech 211(d) grant focuses on the mechanisms to generate employment through the expansion and diversification of existing industry and the creation of new industrial enterprises, particularly, but not exclusively, in the rural areas of developing countries.

While this program is only one aspect of Georgia Tech's continuing interest and commitment to international education and development, it is an important aspect. Tech has a long history of applied management and technical assistance to domestic and overseas industry. One unit, the Industrial Development Division of the Engineering Experiment Station, has provided such assistance to approximately 4,000 industrial enterprises over an 18-year period. Other units have had experiences of various sorts with industry of all sizes.

Hence, the 211(d) grant provides the institution with an opportunity to build its capability to assist small industry from a departure point of considerable experience in the field.

III. OBJECTIVES OF THE GRANT

A. Objectives Restated. The general objective of this program is to strengthen the capabilities of the Georgia Institute of Technology to more effectively apply its present interests, skills, and experience in developing small-scale industries in Georgia and Latin America to the problems of small industry in the less developed countries.

The program will consolidate presently available methodologies for achieving small-scale industrialization and job creation in the LDCs. It will systematically further the development of these methodologies by research, evaluation, generalization, and codification so that generally applicable and transferable principles and procedures will be readily available for effective application in the less developed countries. Innovation in developing new technological approaches to industrialization and employment generation is another objective.

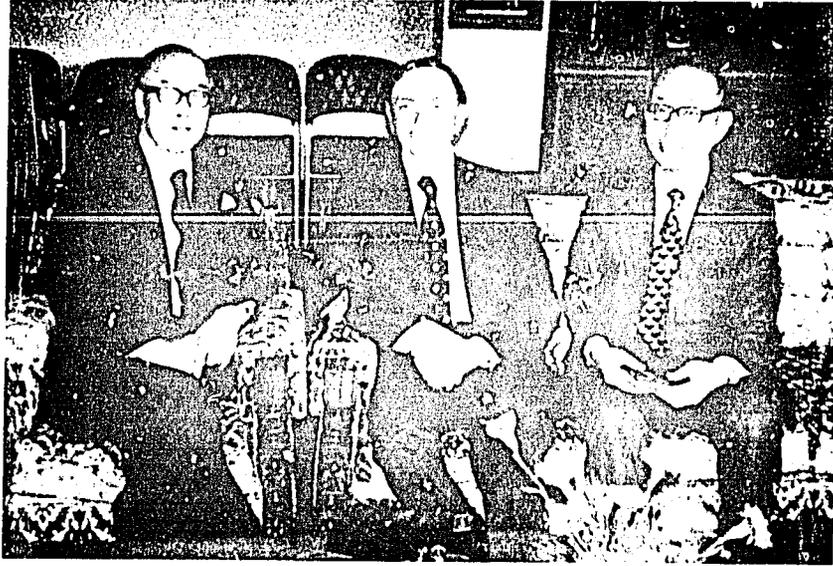
In particular, emphasis will be placed on the following program elements:

- (1) Establishment and maintenance of linkages with six counterpart institutions in developing countries is an essential component. These linkages will provide a real-world laboratory in which to gather jointly essential data and test alternative approaches to the accelerated development of small-scale industry.
- (2) Case studies of LDC small industry problems will be compiled, analyzed, and codified. This data base will be obtained through literature searches and development organization contacts and will be compiled in the field by the program staff when appropriate.
- (3) Analysis of methods and techniques for solving small-scale industry problems and encouraging expansion and diversification will be made to determine the reasons for success or failure under varying environmental conditions.
- (4) New approaches and alternative methodologies will be evolved and tested in the field to determine their suitability for the accelerated development of small-scale industries and elimination of problems.
- (5) Preparation will be undertaken of a graduate degree program, new courses, seminars, and other training programs for students and faculty who have an interest in small-scale industry development. The preparation and testing of these programs will serve to enlarge the capability of the institution's staff in understanding the small-scale industry problems and employment generation processes, and to broaden the base of knowledge in the institution.

The objectives will be achieved through a program of sustained activities in applied research, relevant education and training, appropriate seminars and conferences, and program linkages with other institutions. The knowledge base derived from these activities will provide the institution's staff with valuable inputs and insights, as well as being of interest to development practitioners and organizations. To the extent feasible, the above activities will be implemented in collaboration with these institutions.

B. Review of Objectives. As the program developed in the first and second years of the grant, it became increasingly apparent that the most

KOREA



Left to right, Dr. Kim, Chairman of the Soong Jun University Board of Trustees, Dr. Pettit, President, Georgia Institute of Technology, and Dr. Lee, President, Soong Jun University, during commencement at Soong Jun University in January 1975. Dr. Pettit made the commencement address and received an honorary doctorate in economics from this 211(d) counterpart organization.



Interaction of Georgia Tech team with Soony Jun University, Fall 1975. Left to right, President Lee, SJU; Dr. Crawford, Vice President, Academic Affairs, Georgia Tech; Mrs. Crawford, who was born and brought up in Korea; Dr. Fyffe, Georgia Tech; Dr. Prince, Dean of Engineering, SJU; and Ross Hammond, Georgia Tech.

KOREA



Planning meeting of Soong Jun University and Georgia Tech teams, prior to industrial extension field trips.



Mold room of the Jinhung Cast Iron Company in the Yong Dong Po Industrial Estate, a producer of barbell weights, dumbbells, and shot puts. This company was assisted in upgrading of molding sand and in tensile testing of products by Soong Jun University.

important single element is likely to be the relationship between Georgia Tech and the counterpart institutions. This network of organizations with a common interest in stimulating the developing of small-scale industries serves as information-gathering and dissemination loci, as well as a real-world laboratory for testing alternative approaches to industrialization. Moreover, some of the counterpart activities are likely to provide material for new case histories on industrialization which can be written up during the life of the 211(d) grant, thus making a significant contribution to the development literature.

As a consequence of these developing counterpart relationships, a greater emphasis is being placed on this element of the program than originally contemplated. This will be reflected in larger allocations of resources to on-site work in the counterpart countries in subsequent grant years. Otherwise, the emphasis on other program elements remains unchanged.

C. Review of Critical Assumptions. Basic assumptions related to this small industry project are as follows:

- The labor/technology equation will remain of priority concern.
- U.S. engineering, industrial analysis, entrepreneurial, extension, and economic skills can be more effectively harnessed.
- There will be opportunities for U.S. inputs -- either bilaterally or through multilateral organizations -- that can significantly influence LDC actions.

It is believed that these assumptions were valid initially, still hold true, and that many of the activities generated by the 211(d) and the associated international activities at Georgia Tech, and by counterpart institutions, demonstrate the basic correctness of these assumptions.

IV. ACCOMPLISHMENTS

The second grant year of the Georgia Tech 211(d) program has involved an increasing number of Georgia Tech faculty members and students in a broad program of activities related to small-scale industry development. The annual goals and resulting program outputs are detailed on the following pages. Almost all of the year's goals have been attained or exceeded.

The specific goals established by Georgia Tech for achievement in the second year are detailed in the first-year annual report. For convenient

reference, they are repeated in the detail of each objective/output. Table 1, on the next page, is a quick reference activity profile which compares second grant year goals and results.

A. Applied Research and Knowledge Base (50% of effort)

1. Description. The applied research efforts in the second grant year related to the continued development of the International Development Data Center, including the collection and analysis of case histories, the publication of relevant information documents, and the preparation of research reports resulting from staff field trips to counterpart organizations.

2.(a) Targets for Reporting Year and Means of Verification

<u>Target</u>	<u>Verification Means</u>
Manufacturing opportunity studies (Korea and Nigeria)	Reports
Economic analyses with emphasis on industrialization (Brazil and Philippines)	Reports
Survey of public and private resources and programs for small industry development (Ecuador)	Report
Continued expansion of the International Development Data Center (IDDC)	Report
Keyword reference/selected industrialization case histories	Size of collection
Continued compilation and codification of case histories	File
Initiation of comparative study of counterpart assistance to selected companies in one industry	Interim report

(b) Critical Assumptions. A disastrous flood in March 1975 in southeast Brazil resulted in great damage to the Brazilian counterpart organization (FESSC) and to Tubarao, the city in which FESSC is located. For the following three months, FESSC was busy assisting in the reconstruction and rehabilitation of the region, and its small industry program was temporarily held in abeyance. Since July 1974, the program has been fully reactivated and small industry assistance is being vigorously pursued.

During the reconstruction period, FESSC urgently requested assistance in rehabilitating the small industry sector. Unfortunately, direct disaster relief technical assistance funding could not be obtained by Georgia Tech for this purpose. In any event, the Brazilian counterpart institution showed

Table 1

QUICK REFERENCE ACTIVITY PROFILE: GRANT YEAR TWO

<u>Planned Goals</u>	<u>Actual Results Achieved</u>	<u>Due Date if Goal Not Achieved in Grant Year Two</u>
Two manufacturing studies (Korea and Nigeria)	One industrial report (Korea)	
Two economic analyses (Brazil and Philippines)	Two economic reports (Ecuador and Nigeria)	
One survey of small industry program (Ecuador)	One case history report (Ecuador) Additional unplanned publications: "Guidelines for Industrial Extension Personnel" (13), "Curricula Research and Development" (Korea), "A Seven-Country Survey of Certification Licensing and Quality Marks Programs"	Available in May 1975
Continued expansion of Data Center	Added 1,000 books and pamphlets Circulated 250 periodicals to 211(d) staff Responded to 1,535 requests from U.S. and 12 other countries	
Keyword reference/case histories	"Provisional Keyword Index of the Small-Scale Industry Case Studies"	
Collection of small industry case histories	Continued compilation of published cases Additional unplanned publications: "Guide to International Statistical Sources and National Development Plans at IDDC," "An International Compilation of Small-Scale Industry Definitions," monthly current awareness compilation of new information -- <u>The International Informer</u>	

Table 1 (continued)

<u>Planned Goals</u>	<u>Actual Results Achieved</u>	<u>Due Date if Goal Not Achieved in Grant Year Two</u>
Comparative study of counterparts' assistance to one industry	Not pursued because of difficulty of coordination and communication; replaced by "Guidelines for Industrial Extension Personnel" (See above)	
Presentation of graduate program in industrialization	Program initiated September 1974 with four master's program students	
Changes to graduate program as needed	None needed	
Presentation of new course	First presentation -- April 1974 "Evaluation and Analysis of Industrial Projects"	
Development of additional new course	In preparation -- "Projects in Small Industry Development"	First offering -- Fall 1975
Development of training course and on-site testing	Course material complete (November test in Nigeria postponed)	On-site testing: Philippines, June 1975; Nigeria, August 1975
Training program -- market analysis and feasibility studies	Presented in June-July 1974 to Korean counterpart interns	
Dissemination of graduate program information	Seven conferences attended	
Seminar presentations	Eight small industry seminars by invited participants Six seminar presentations by 211(d) staff	

Table 1 (continued)

<u>Planned Goals</u>	<u>Actual Results Achieved</u>	<u>Due Date if Goal Not Achieved in Grant Year Two</u>
Communication with counterparts	Average of twice monthly communication Thirty-five staff field trips to counterparts (16 people) Ten counterpart visits to Georgia Tech	
Communication with AID and other international organizations	Weekly contact with AID/Washington	
Two Internal Advisory Committee meetings	Two meetings -- March and December 1974	
One External Advisory Committee meeting	One meeting -- July 1974	
Twelve program staff coordination meetings	Sixteen meetings held	
One annual report	One annual report	

<p>Additional unplanned activities: Visits to observe 211(d) program -- 45 foreign visitors to Georgia Tech AID 18-month review of program (change recommendations have been implemented by Georgia Tech)</p>

considerable rehabilitative capacity not only internally, but in area reconstruction assistance efforts as well.

3. Accomplishments

(a) Accumulative. During the first two years of the grant, the applied research activity has resulted in the publication of two annual reports and 21 published reports, papers, newsletters, and brochures on various subjects related to small-scale industry and to selected counterpart countries. A complete listing of these publications can be found in Appendix I. In addition, an information center has been initiated and expanded which provides responses to inquiries from all over the world.

(b) Reporting Year. The International Development Data Collection (IDDC) doubled in holdings during the second grant year and now contains about 2,000 publications and 250 periodicals. New material is acquired on a daily basis.

Data collection materials are widely circulated to program staff members and other interested Georgia Tech faculty members and to overseas counterparts (under separate Georgia Tech funding). Published case history collection and codification is proceeding, and one of the publications generated by Georgia Tech represents a case history on the small industry sector in Ecuador.

In addition, a compilation report titled *Provisional Keyword Index of the Small-Scale Industry Case Studies* has been published as an aid to researching the case history document file.

Three additional publications over and above the target goals for the year also were produced by the International Development Data Center staff. They are listed below:

A Guide to International Statistical Sources and National Development Plans at IDDC (A listing of statistical sources and country development plans on file in the data collection). Two copies are included in the annex materials.

An International Compilation of Small-Scale Industry Definitions (the official individual country definitions of small-scale industry where they exist; those countries without official definitions of small industries are listed as well). Two copies are included in the annex materials.

The International Informer (a monthly listing of new acquisitions at IDDC). One hundred fifty copies are distributed monthly on campus

and to counterpart institutions to generate assistance and information requests and to improve project communications. This current awareness publication keeps the main Georgia Tech library informed of holdings at IDDC. A copy is attached as Appendix IV.

IDDC has responded to approximately 1,335 internally generated requests for information. In addition, during the second grant year, about 200 requests for technical assistance and information were received from overseas organizations and answered by the IDDC staff.

The IDDC also has been supportive of activities in the field which have led to the production of staff published reports on the industrial sector and the economies of counterpart countries.

Reports of this nature which were published during Grant Year Two are listed below:

(1) *Improving the Productivity of a Small Industry in Rural Korea* (Yong In, Korea). A demonstration research report of an analysis of the problems of a rural small industry in Korea with recommendations for increasing productivity, business volume, and employment.

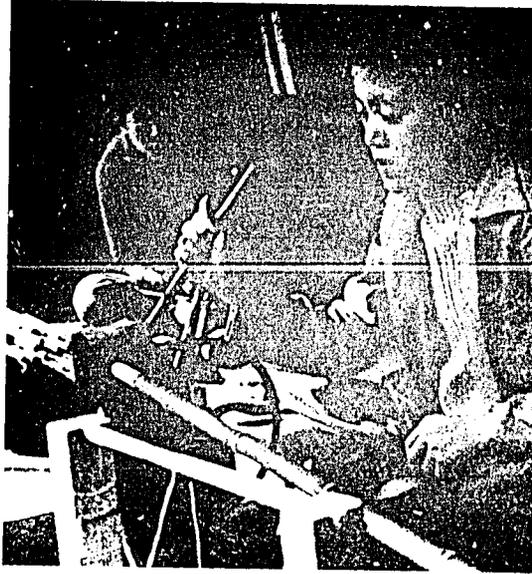
(2) *The Prospect for Economic Development in Nigeria*. An overview of the state of economic development (primarily industrial development) in Nigeria. This report is intended for 211(d) program staff use in preparation for field trips to that country.

(3) *The Promotion of Industrial Development in Ecuador*. This short report reviews the state of the economy and economic development in Ecuador. It is intended for 211(d) program staff orientation purposes, along with other materials.

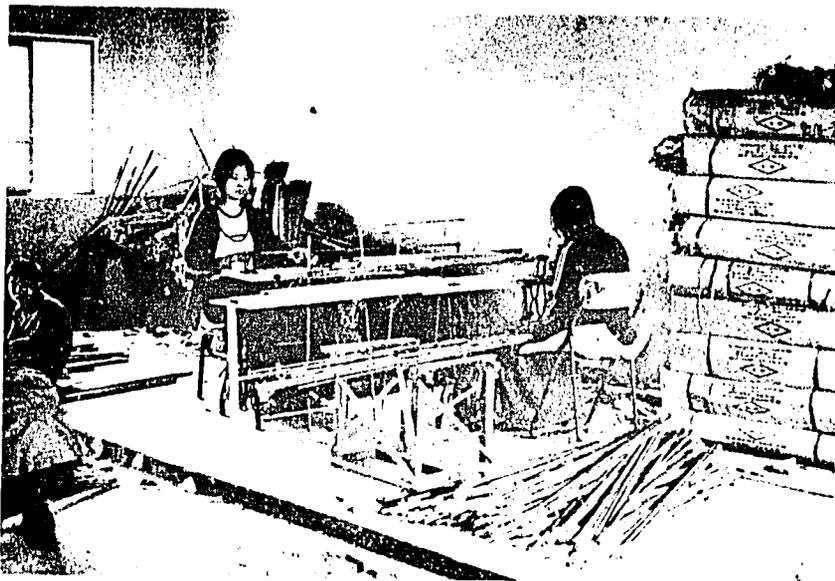
(4) *Small Industry Development in Ecuador -- A Case History*. This report was generated as the result of participation in an OAS survey team which reviewed various aspects of the economy and made recommendations for the consideration of the Government of Ecuador.

(5) *Guidelines for Industrial Extension Personnel*. This to-be-expanded series of 13 guidelines for industrial extension personnel is intended as background material for industrial extension practitioners. The series covers a wide range of subject headings, as follows:

K O R E A

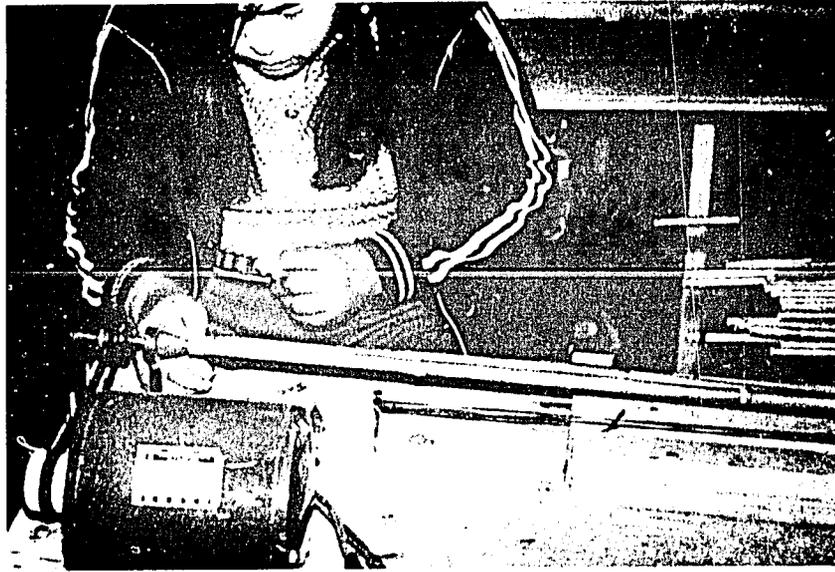


Original method of winding string on bamboo fishing pole sections. Operator on floor feeds thread with left hand while turning bamboo section by means of eccentric crank and wheel with right hand. Yong Jak Factory, Yong In, Korea.



Revised thread-winding operation. Operator seated at work surface, with bamboo sections being turned by foot treadle from sewing machine. Both hands free to feed thread onto section. Productivity approximately doubled by this university team recommendation.

K O R E A



Improved thread-winding operation utilizing table-mounted electric motor for rotating bamboo sections. Productivity increase over original thread-winding operation approximately 300%.



Reconstruction after January 1975 fire at Yong Jak Fishing Pole Factory which destroyed two thirds of plant. While 15 employees continued production in undamaged section, plant reconstruction began immediately. Within three weeks, reconstruction was complete and full production was resumed.

An Approach to Furnishing Industrial Extension Services to Small-Scale Industry
The Generation and Evaluation of Venture Ideas
Selection of Appropriate Technology
Resource and Technical Analysis
Advising the Prospective Entrepreneur on Going into Business
A Systematic Approach to Small-Scale Industry Growth
The Presentation of Investment Proposals
Factors in Plant Layout
A Simplified Cost and Control System for Small Industrial Concerns
Inventory Control for Small-Scale Manufacturing
Production Planning and Control for Small-Scale Manufacturing
How to Use a Private Management Consultant
Selected Bibliography

This activity replaced a planned comparative study of counterpart assistance to one type of industry which was found to be impractical to initiate and coordinate. This published series is provided in lieu of one of the industry studies proposed for Grant Year Two.

(6) *Curricula Research and Development -- Korea*. This report researches the need for industrial engineering curricula in Korea and the nature of the courses needed. Georgia Tech's Korean counterpart, Soong Jun University, successfully petitioned the Ministry of Education for permission to establish a Department of Industrial Engineering and to grant degrees in industrial engineering. The degree program will be initiated in the fall of 1975.

This study was prepared as a result of responding to a perceived need in Korea, and was an additional publication not planned for in the annual goals.

(7) *A Seven-Country Survey of Certification Licensing and Quality Marks Programs*. This quality control-oriented analysis compares the state-of-the-art condition of certification licensing and quality marks programs in Hong Kong, India, New Zealand, Philippines, Republic of China, Singapore, and Thailand.

Copies of the above-listed reports 1, 4, 5, 6, and 7 are included in the annex materials. Reports 2 and 3 are internal documents intended for staff use.

(c) Total Expenditures. Accumulative expenditures (two years) under the category of Applied Research total \$138,200, of which \$92,000 occurred in the second grant year.

In addition, the 211(d) and associated international development activities were augmented by approximately \$46,000 in Georgia Tech funds.

B. Education and Training (15% of effort)

1. Description. The major thrust of this activity was to design, obtain approval of, and offer a graduate program at the master's level which focused on industrialization. This has been achieved, and along with new course development and presentation, is an ongoing activity in the School of Industrial and Systems Engineering at Georgia Tech. Spin-off short training programs also are being developed and will be field tested in 1975.

2. (a) Targets for Reporting Year and Means of Verification

<u>Target</u>	<u>Verification Means</u>
Presentation of graduate program on industrialization (September 1974)	Program presentation
Changes to graduate program as indicated	-
Presentation of new course (April 1974)	Presentation made
Development of additional course in graduate program	New course listing
Development of a training course and on-site testing of course	Materials and presentation
Training program -- market analysis-feasibility	Presentation
Dissemination of graduate program information for prospective students	Visits and mailings

(b) Critical Assumptions. No untoward circumstances have impeded the design and presentation of the graduate program. On-site testing of the training program in October 1974 at the University of Ife (Nigeria) was delayed at the request of that university, and is now scheduled for August 1975.

3. Accomplishments

(a) Accumulative. To date, a new Master of Science curriculum has been designed, developed, approved, and presented in the School of Industrial and Systems Engineering. It has been widely publicized, and the initial

GRADUATE PROGRAM



Students enrolled in the Master of Science program with emphasis on industrialization. Left to right, Jorge Arguelles, Jaime Jaramillo, Antonio Quezada, Gerardo Gochicoa, with Professor David E. Fyffe, Academic Advisor.



Students in the Industrialization Program utilize resources of the International Development Data Center for project and course work.

offering has four students pursuing the degree. One new course has been developed and presented, and a second new course is being prepared. A one-week training program has been developed from the new course and will be tested overseas before finalization. Three of the four students in the master's program are receiving support from the 211(d) grant.

(b) Reporting Year. In September 1974, the master's program was initiated with an enrollment of four students, all from Latin America. It is anticipated that this enrollment will triple in 1975 and continue to increase to an expected level of about 20 enrollees from the U.S. and developing countries if support funding can be developed. A complete progress report is submitted as Appendix II.

A new course, "Analysis and Evaluation of Industrial Projects," was first presented in the Spring Quarter of 1974. A second new course, entitled "Projects in Small Industry Development," is being developed, and a course outline is included in Appendix II.

Information in the form of brochures and detailed curriculum outlines has been prepared and disseminated widely. Dr. David Fyffe, the responsible 211(d) program individual, has personally visited four counterpart countries to promote the graduate program and generate students for it. It is anticipated that this will result in additional applicants.

A one-week preliminary training program, based on "Analysis and Evaluation of Industrial Projects" course content, has been developed. This includes detailed lecture outlines and writeups, as well as background materials.

It is planned that this training program will be tested in the Philippines (June 1975) and in Nigeria (August 1975) in joint presentations with counterpart institutions in those countries. After testing, a final package will be prepared for the use of counterpart organizations and other interested organizations.

In addition, a training and internship program in market analysis and feasibility study preparation for Soong Jun University counterpart personnel was designed and developed for presentation in Atlanta. The actual training program presentation was done under the Small Industry Grant contract during the period June 15 to July 15, 1974. The participants were Drs. Prince and Yoon and Professor Lee.

All annual goals in the Education and Training activity were met, except for the delay in field testing of the training program.

(c) Total Expenditures. Accumulative expenditures (two years) under the category of Education and Training total \$44,000, of which \$27,000 were expended in the second grant year.

C. Conferences and Seminars (7% of effort)

1. Description. The purpose of this activity is to expose a broad spectrum of the Georgia Tech faculty, staff, and students to international development activities of other organizations, thereby promoting understanding of and communication with these organizations. A secondary purpose is to have 211(d) program-associated staff attend and participate in relevant conferences, seminars, and workshops.

(a) Targets for Reporting Year and Means of Verification

<u>Target</u>	<u>Verification Means</u>
Six to nine seminar presentations by invited lecturers	Seminars
Participation in relevant conferences and seminars	Papers

(b) Critical Assumptions. This function proceeded as anticipated with no unexpected internal or external factors impacting on the activity.

3. Accomplishments

(a) Accumulative. The International Development Seminar series presented by visiting lecturers continued during the second grant year. In the first two years, 16 formal and three informal seminars were held, with a total attendance of approximately 500, made up of Georgia Tech administration personnel, faculty, 211(d) program staff, and others.

In addition, 211(d) staff personnel attended and, in many cases, were program participants in 11 small industry-related conferences and 14 seminars or workshops. Presentations and/or formal papers were given at a number of these meetings by the program-associated staff.

(b) Reporting Year. During the second grant year, eight international development seminars were presented, as listed in Table 2 on the next page.

Table 2

INTERNATIONAL DEVELOPMENT SEMINAR SERIES
Atlanta - Grant Year Two

<u>No.</u>	<u>Date</u>	<u>Lecturer</u>	<u>Title of Seminar</u>
1	May 7, 1974	Dr. Samuel Aluko University of Ife Nigeria	Industrial Research in Nigeria
2	May 10, 1974	Dr. Amir Khan International Rice Research Institute Philippines	Mechanization Technology
3	May 20, 1974	Dr. Theodore Pinnock Tuskegee Institute Alabama	Tuskegee's Human Resources Development Center
4	June 14, 1974	Dr. Joseph Stepanek Asian Institute of Technology Thailand	New Perspectives for Industrialization in Asia
5	June 17, 1974	President Inge Lee Professor Kim Yeungnam University Korea	Regional Adaptive Technology Center Program and Strategy at Yeungnam University
6	June 28, 1974	Fred Burian East-West Center Hawaii	Documentation of Small Industry Projects
7	Oct. 29, 1974	Mr. Carl Goderez International Bank for Reconstruction and De- velopment Washington	The World Bank Small Industry Project in Nigeria
8	Dec. 2, 1974	Mr. Thomas Lawand Brace Research Institute Canada	Research Activities at Brace Research Institute

CONFERENCES AND SEMINARS

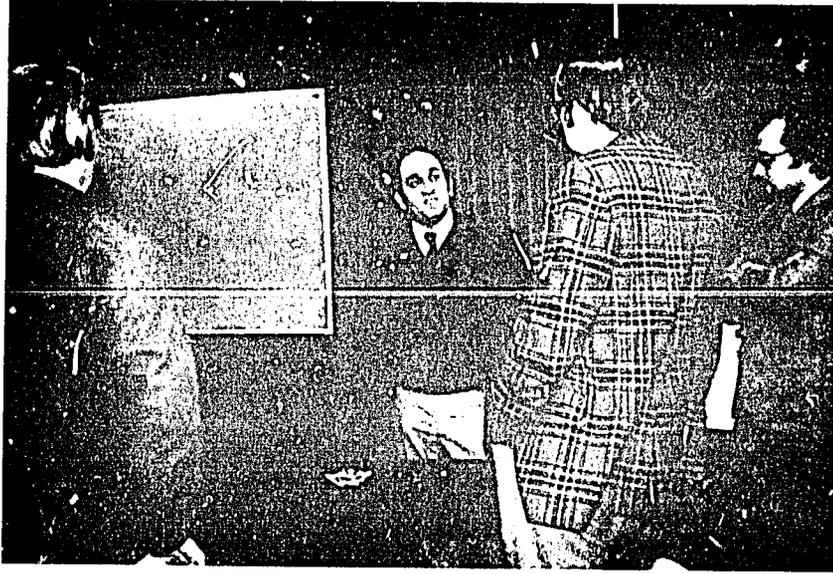


A three-day seminar attended by representatives of the organizations involved in a small industry development network resulted in better understanding of programs and a greater interaction between organizations. Participants from Nigeria, Philippines, and Ghana are shown here.



Seminar participants from Brazil and Nigeria are shown with Georgia Tech staff people, listening as Dr. Lewis, Acting Head of the Industrial Research Unit (IRU) at the University of Ife in Nigeria, discusses the IRU program.

CONFERENCES AND SEMINARS



Under the 211(d) grant to Georgia Tech, a series of seminars is presented by guest lecturers. Here Mr. Thomas Lawand, of Brace Research Institute in Montreal, who presented the sixteenth seminar in the series, is seen talking to Dr. Albert Sheppard, Associate Vice President for Research at Georgia Tech.



Some of the more than 120 persons from 35 countries who attended a two-day international development conference in Atlanta in early 1975. The conference theme was "Techniques and Methodologies for Stimulating Small-Scale Labor-Intensive Industries in Developing Countries." This AID-funded conference brought the small-scale industry counterpart organizations together for the first time.

These seminars were publicized on campus by means of posters, notices, and mailings to all foreign students. A typical poster is included as Appendix III. Average attendance was 33, and a total of 264 attendees was noted, involving a broad cross section of the Institute.

A listing of participation by 211(d) program staff members in conferences and seminars follows:

- A seminar presentation to AID and outside agency personnel was made at AID/Washington by Nelson Wall, John Tatom, and Ross Hammond.
- As a result of the above seminar, James Knight was invited to a UNIDO Puerto Rican conference to make a presentation on "Pyrolytic Conversion of Agricultural Wastes."
- The annual TA/OST Symposium held at Massachusetts Institute of Technology was attended by Ross Hammond
- A seminar by Nelson Wall was presented to staff of the Corporacion Financiera Popular (CFP) in Bogota, Colombia.
- Ross Hammond presented a paper at the OECD meeting in Paris titled "Low-Cost Technology and Rural Industrialization."
- A week-long seminar in Mexico City on "Information Transfer" was attended by Richard Johnston.
- Ross Hammond participated in a planning conference in Bangkok for the Asian Institute of Technology research project "New Perspectives for Industrialization in Asia."
- A seminar presentation in Korea on industrial extension was made to Soong Jun University administrators and faculty by Nelson Wall.
- Nelson Wall made similar seminar presentations to staff personnel of the Institute for Small-Scale Industries in Manila and CENDES in Quito.
- The annual AID TA/OST contractors meeting, held in San Antonio, was attended by Edwina Udunka and Ross Hammond, and a first edit of a video tape on small industry development activities in Korea was shown.
- Ross Hammond, as a member of the Executive Committee, attended the ASEE International Division midwinter meeting in Tucson where plans for the World Congress were reviewed.
- While on assignment in Korea, Ben James participated on the program of a conference between Soong Jun University and the Yong Dong Po Industrial Estate and another between the University and the Taejon Chamber of Commerce and Industry which led to cooperative small industry agreements between Soong Jun and these organizations.
- Ross Hammond presented a paper, "A Comparative View of Technology Transfer: Domestic and Overseas," at the Iowa State University seminar titled "Symposium on Technology, Modernization, and Cultural Impact."

(c) Total Expenditures. Two-year accumulated expenditures were \$21,100, of which \$12,600 in expenditures occurred in the second grant year for Conferences and Seminars.

D. Counterpart Linkages (18% of effort)

1. Description. The primary goal of the 211(d) grant to Georgia Tech is to build a strengthened capability to successfully stimulate small industry development in developing countries on the existing experience base at Georgia Tech. The grant called for a linkage with at least four overseas counterpart organizations, in order to facilitate the achievement of the 211(d) primary goal. As a result of an extensive screening effort in the first grant year, five formal interaction agreements and one informal agreement were reached with counterpart organizations in Asia, Africa, and Latin America. These organizations are the principal communication and linkage elements in the program. They serve as vehicles for the transmittal of information and technology, provide knowledge of their countries' small industry environment, facilitate program staff interactions, and provide in-country bases for research related to small industry development.

These six counterpart organizations, along with Georgia Tech, now compose a linkage network with a common interest in the development of the small industry sector in their respective countries. Base information on the network is shown in Table 3 on the next page.

2. Targets for Reporting Year and Means of Verification

<u>Target</u>	<u>Verification Means</u>
Frequent communication with counterparts	Liaison
Provision of technical information to counterparts (utilizing institution, not 211(d), resources)	No. of responses to inquiries
International travel for on-site studies	Reports

(b) Critical Assumptions. No outside events beyond the control of Georgia Tech had an adverse effect on the counterpart linkages. However, the informal nature of the arrangement with the Kenya Industrial Estates led to less interaction with that counterpart, while the burgeoning 211(d) and other interactions with the five formal counterparts required the bulk of the program network effort and expenditures.

Table 3
1975 MEMBER ORGANIZATIONS - SMALL SCALE INDUSTRY NETWORK

<u>Organization Name and Address</u>	<u>Principal Contacts</u>	<u>Cooperative Agreement in Force</u>	<u>Type of Organization</u>	<u>Major Interests and Activities in Small Industry Area</u>	<u>Basis of Relationship with Georgia Tech</u>	<u>Comments and Additional Data</u>
Centro de Desarrollo Industrial del Ecuador (CENDES) Casilla Postal 2321 Quito, Ecuador Cable: CENDES	Econ. Marcelo Avila Orejuela, Executive Director	Yes	National Industrial Development Center Part of Ministry of Commerce and Industry Staff - 100+	Industrial research Management and technical assistance Market analysis Government industrial development plan implementation	211(d) counterpart	Regional office in Guayaquil. 100+ published reports. Field office in Cuenca.
Fundacao Educacional do Sul de Santa Catarina Caixa Postal 370 Tubarao, Santa Catarina Brazil	Prof. Osvaldo dela Giustina Prof. Jose Muller	Yes	State educational institution and research unit Staff - 50+ Students - 2,500+	Industrial research Community development Regional research and development	211(d) counterpart Small industry project	Relatively new organization closely related to area industry. Major interest in coal found in area.
Georgia Institute of Technology Atlanta, Georgia 30332, U. S. A. Cable: ENEXPSTAT, Atlanta	Ross W. Hammond, Chief, Industrial Development Division (IDD) Nelson C. Wall	Yes	State educational institution and Engineering Experiment Station Students - 10,000	Industrial development Resource development Community development Industrial extension International development		Major IDD functions: applied research, service, training, and technology transfer oriented to employment generation
University of Ife Ile-Ife, Nigeria Cable: IFEVARSITY, Ile-Ife	Prof. Sam A. Aluko, Head, Industrial Research Unit (IRU) Dr. A. O. Lewis, Acting Head	Yes	Technological university IRU staff - 20 Students - 4,000	Industrial research Small industry surveys Management assistance Economic development	211(d) counterpart	IRU has interviewed 30,000 household and small industries and analyzed these primary data in a series of reports.
Kenya Industrial Estates, Ltd. P. O. Box 18282 Likoni Road Nairobi, Kenya Cable: NAINDEST	Mr. K. A. Ng'eny, General Manager Mr. B I.O. Ayoro, Prog. Mgr., Rural Ind. Dev. Program	-	Part of Industrial and Commercial Development Corp. (ICDC) Staff - 75	Industrial estate development Rural industrial development Management and technical assistance Financial assistance (ICDC)	Informal working relationship	Several industrial estates in being or planned. Several rural industrial development centers are operational.
Soong Jun University 135 Sang-Do Dong Seoul 150, Korea	Dr. H. B. Lee, President Dr. Y. B. Ouh, Integrated Dev. Center	Yes	Two-campus private university Staff - 50 Students - 2,100	Industrial extension Regional development Entrepreneurship development Technology transfer	211(d) counterpart Small industry project	Initiated an Integrated Development Center, a Science Research Institute, a Regional Development Institute, and an Industrial Technology Institute.
Institute for Small-Scale Industries University of Philippines Virata Hall, Diliman Quezon City, D505 Philippines	Dr. Leon V. Chico, Director	Yes	Institute associated with the University of the Philippines Staff - 70	Industrial training Management consultancy Industrial technology Industrial extension Industrial research	211(d) counterpart	Heavy emphasis on industrial training programs and seminars. Establishing (1974) five regional centers. Industrial technology activity expanding.

BRAZIL



An office furniture manufacturing firm located in Tubarao that is a potential employer of female labor received assistance in the areas of work methods, inventory, and cost controls. The expanding business that followed the cost reduction program resulted four months later in the hiring of 10 additional women.



FESSC, a 211(d) counterpart institution, undertook the technical assistance tasks necessary to revitalize a small citrus essential oils extracting plant that was inoperative due to financial, technical, and administrative problems. The plant is now in operation and employing 15 people.

BRAZIL



A candy and jellies manufacturing firm in the rural community of Braco do Norte received technical assistance that led to the expansion of its banana candy line, as well as a 35% reduction of its inventory carrying costs.



A labor-intensive firm that enamels stove parts in Braco do Norte benefited from the assistance provided by FESSC. Here IDD's George A. Morelos and FESSC's Humberto Dalsasso discuss with the owner some of the problems identified at the spraying booths station. Average rejection rates were reduced from 24% to 9%, and kiln capacity was increased by 25%, which led to the working of a second shift and the hiring of 13 additional people.

3. Accomplishments

(a) Accumulative. As a result of screening 30 organizations in 12 countries, six organizations with a strong small industry orientation agreed to serve as counterparts. Monthly contacts are maintained with most counterparts and numerous on-site and U.S. interactions between staffs have been occurring. Counterparts have received much technical information and many responses to inquiries.

A two-year total of 34 field trips have been made to counterpart countries by 211(d) program staff. Many of the published reports previously cited were generated directly through these counterpart field trips. A total of 12 internship and orientation visits to Georgia Tech in Atlanta have been made by staff personnel of counterpart organizations (these were funded from other grants and contracts but resulted in a strengthening of counterpart linkages).

(b) Reporting Year. During the second grant year, communication with all counterparts was effected by means of letters, cables, telephone calls, on-site field trips, and personal contacts in Atlanta. Such communications or contacts averaged twice monthly with the five formal counterparts and quarterly with the informal counterpart.

Approximately 1,535 requests for information, publications, or technical assistance were generated by the 211(d) and associated contracts and grants during the grant year. The 211(d) program staff and other staff personnel were able to respond to about 90% of these inquiries through the knowledge of personnel or from materials readily available at Georgia Tech. Five hundred copies of publications were sent to the counterpart organizations to augment their small industry collections.

The majority of these responses, as well as the publications and technical information, were provided from funding sources other than the 211(d) grant because of the limitation under the grant on the direct provision of technical assistance.

During the second grant year, 24 individual field trips were made by 14 different 211(d) program staff members. They varied in duration from one week to six weeks per counterpart. The shorter field trips involved staff orientation, counterpart familiarization, or administrative review of project activity. The longer field trips involved the preparation of research reports of various kinds.

Ten staff people from counterpart organizations visited Georgia Tech during the period for various 211(d) or associated activities. The duration of these interactions ranged from a few days to about five weeks.

(c) Total Expenditures. Accumulated expenditures (two years) under the category of Counterpart Linkages total \$77,900, of which \$32,000 were expended in the reporting year.

E. Administration and Coordination (10% of effort)

1. Description. Because of the multidisciplinary nature of the 211(d) grant activity, which involves personnel of at least four separate organizational units of the Georgia Institute of Technology and six overseas organizations, planning and coordination is an important element. Within the general scope of Administration and Coordination are such functions as day-to-day operations, internal and external communications, meetings of the Internal and External Advisory committees, program staff coordination meetings, and visits by foreign observers to the program.

2. (a) Targets for Reporting Year and Means of Verification

<u>Target</u>	<u>Verification Means</u>
Planning and coordination	-
Communication with AID and other involved organizations	Correspondence
Two Internal Advisory Committee meetings	Meetings
One External Advisory Committee meeting	Meeting
Twelve program staff coordination meetings	Meetings

(b) Critical Assumptions. Not applicable.

3. Accomplishments

(a) Accumulative. Since the initiation of the grant two years ago, the annual goals have been met or exceeded as follows:

- (1) Continual project planning and coordination have been carried on.
- (2) Frequent communication has been maintained with the sponsor, counterpart organizations, and international development organizations.
- (3) Four Internal Advisory Committee meetings have been held and two External Advisory Committee meetings have been held.

ADMINISTRATIVE



Because the Georgia Tech 211(d) grant involves personnel of four major units of the institution, it is necessary to hold frequent program coordination meetings. Pictured here is one of sixteen program coordination meetings held during the second grant year.



As a result of the 211(d) grant activity, a great many visitors and observers have visited the Georgia Institute of Technology. Here Mr. Percy Mistry, of the World Bank (IBRD), chats with Richard Johnston of Georgia Tech, on the right, about international development information problems.

- (4) Thirty-two program staff coordination meetings have been held.
- (5) One 18-month AID review of the program was implemented.
- (6) Sixteen program staff members were involved in overseas field trips.
- (7) Fifty-five foreign visitors came to Atlanta for varying periods of time to observe the program.

(b) Reporting Year. During the reporting year, the following activities took place under the category of Administration and Coordination:

(1) Project planning and coordination have increased roughly in proportion to increased expenditures during the second grant year.

(2) Communications, internal and external, also have increased in frequency and substance, since the first-year activity was largely start-up in nature, while the second-year activities were more substantive, requiring greater interaction. Sixteen internal staff coordination meetings were held during the reporting year.

(3) The programmed meetings of the Internal Advisory Committee (2) and the External Advisory Committee (1) were held as scheduled.

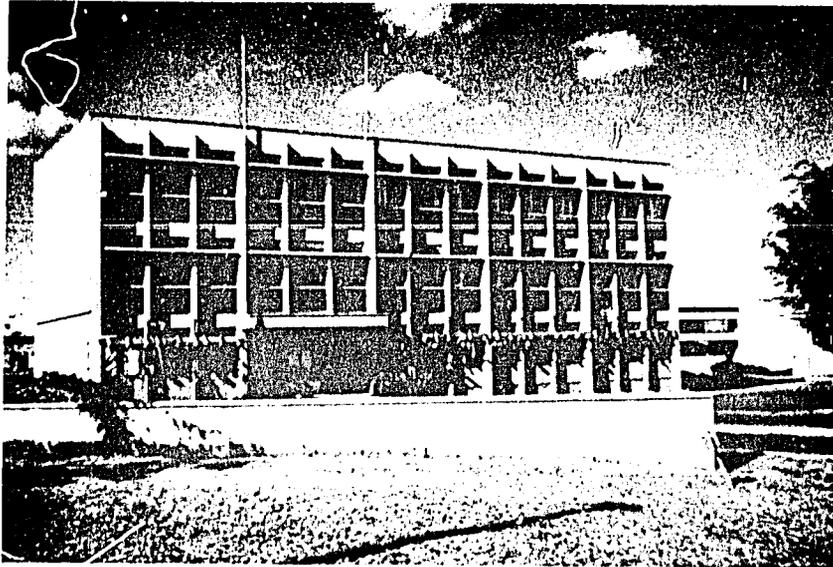
(4) The 18-month AID program review was held in conjunction with the External Advisory Committee meeting. Three minor recommendations resulting from the 18-month review were set forth, as follows:

● *That the data collection and reference center activity be more fully incorporated into the regular university system and made available to all students.*

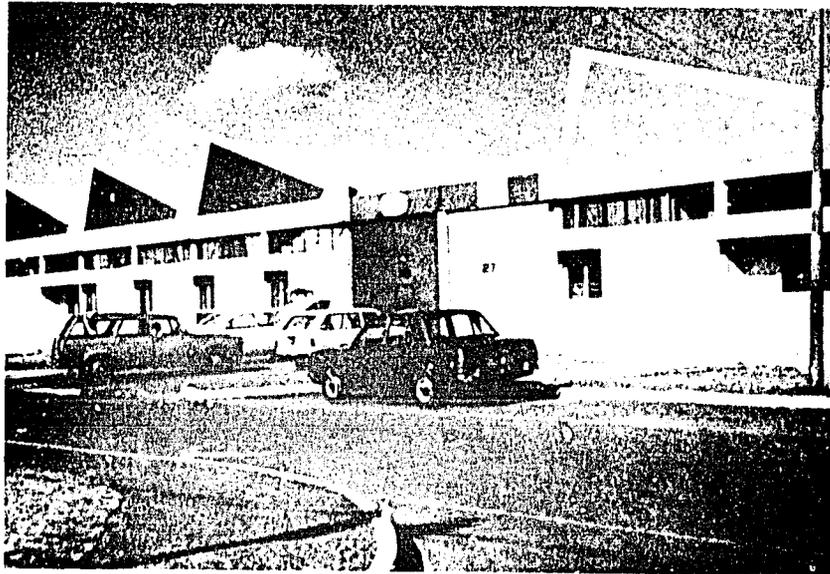
As a result of several consultations with the Georgia Tech library, a number of steps have been taken to accomplish this suggestion. The library administration felt that an integration of the card file maintained at the Engineering Experiment Station with the main library was inappropriate, and the following solution was adopted:

Each month IDDC produces a list of material available at the Center. This current awareness publication is entitled The International Informer. It is sent to the main Tech library, the architectural library, the Water Resources Center, the Student Center, each school or department, and to certain faculty members. In addition, copies are sent to the library of each University System member, to the department heads at Southern Tech, and to certain faculty members at Georgia State University, as well as to the libraries at Emory University

KENYA

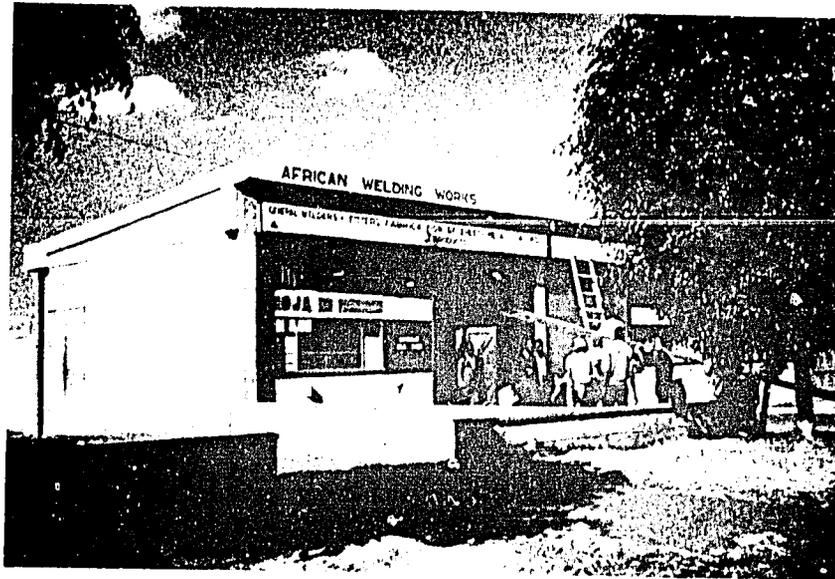


Headquarters in Nairobi of the Kenya Industrial Estates Ltd. This subsidiary of the Industrial and Commercial Development Corporation is concerned with developing industrial estates and rural industrial development centers in a number of Kenya locations.

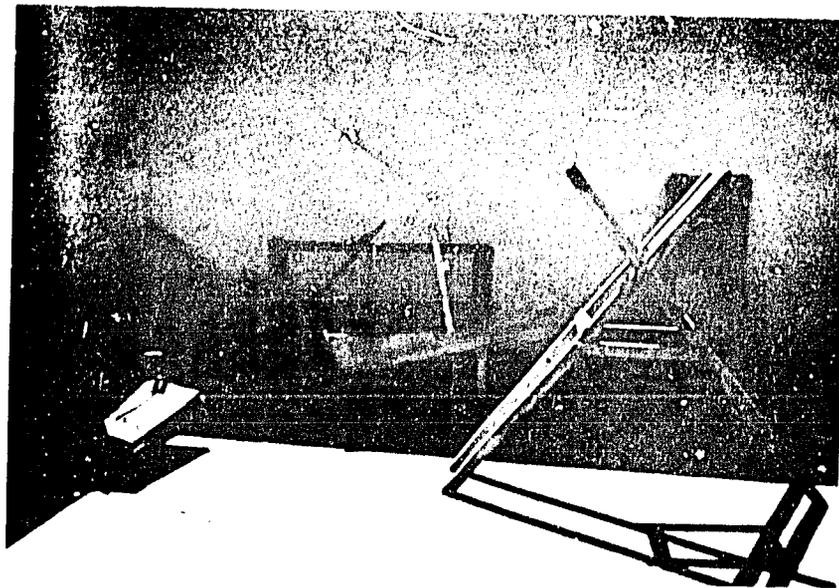


General-purpose industrial building in the industrial estate in Nairobi developed by the Kenya Industrial Estates Ltd. KIE provides management and technical assistance to the organizations which lease space in the industrial estate.

KENYA



Another industrial estate-type building located in the Nairobi estate, occupied by a metal fabrication job shop.



A corner of the yard at the Machakos Rural Industrial Development Center showing some of the devices produced locally, including a wooden wheelbarrow produced from locally available materials and the frame of a hand-operated corn shelling device, appropriate where electric power is lacking.

and Atlanta University Center. Local consulates, banks, and organizations also receive the publication.

A listing of the serial title holdings of IDDC has been prepared and sent to all the University System libraries and other organizations in the area.

The Georgia Tech library officials and the IDDC staff agree that these procedures are the most logical, effective, and desirable methods to make this information available to IDDC staff, Tech students, faculty, and interested persons in the Atlanta area.

• That involvement of graduate and other students in the activity be pursued either through mini-grants for research or via some other mechanism.

During the past grant year, a total of seven graduate students and one undergraduate student were supported by the 211(d) grant and involved in the program activities. In addition, approximately 40 domestic and international students attended the international development seminars (foreign students receive notices of these). Many students utilize the International Development Data Collection.

• That Georgia Tech understands it should actively seek external financing through utilization in the area of competence being established.

This is well understood, and during the reporting year a number of contacts were made with other funding organizations. The possibility of such funding exists from organizations in Mexico, Colombia, and Nigeria, and from international organizations such as the World Bank, Organization of American States, and the United Nations Industrial Development Organization.

In addition, involvement with a number of AID units and missions other than the TA/OST activity through the 211(d) grant is being pursued.

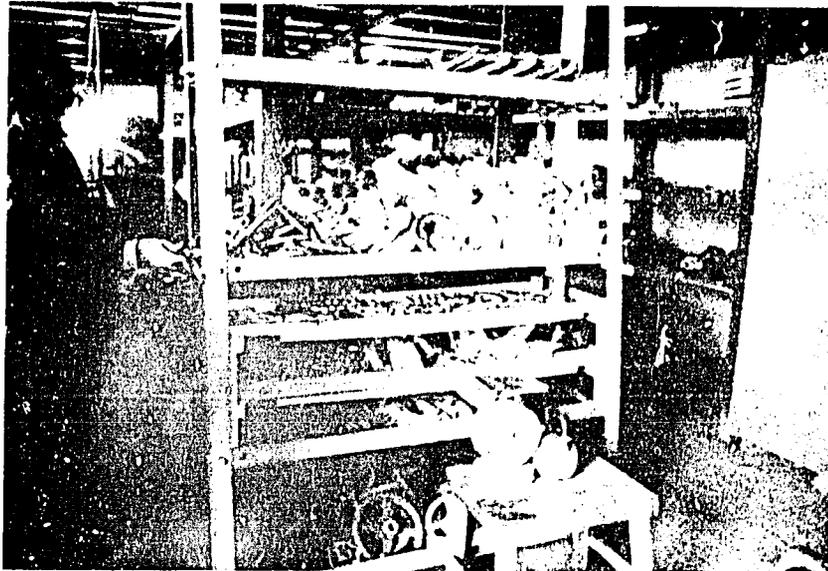
Other suggestions which have been implemented were that Georgia Tech sponsor an international development conference (two are planned, in March 1975 and April 1976), that IDDC issue a small industry newsletter, and that it budget by outputs.

(c) Total Expenditures. The two-year expenditures for Administration and Coordination have amounted to \$31,000, of which \$18,000 occurred in the reporting year.

KOREA



Low-cost tensile test machine built in the mechanical engineering laboratories at Soong Jun University, in response to a need of small metalworking companies of the Yong Dong Po Industrial Estate.



Interior of parts storage area of Sam Ho Wood Machine Company, showing numbered parts bins containing woodworking machine parts. The Soong Jun University team worked with this industry to produce machine drawings, a cost accounting system, and better inventory controls.

KOREA



Treated hides in process in the Dong Jin Lee Tannery in Taejon, Korea. Soong Jun University faculty assisted this company in determination of best water source, water softening methods, and optimum chemical temperature for dissolving in-process liquid.



Dr. Ouh, Director of the Integrated Development Center at Soong Jun University, and Mr. Kim, Director of the Yong Dong Po Industrial Estate, with plaque commemorating the cooperative agreement between the University and the Industrial Estate.

V. IMPACT OF GRANT-SUPPORTED ACTIVITIES IN ACHIEVING GRANT OBJECTIVE

During the second grant year, the interdisciplinary 211(d) program continued to involve four major units of Georgia Tech: The Industrial Development Division of the Engineering Experiment Station, the School of Industrial and Systems Engineering, the College of Industrial Management, and the Southern Technical Institute. However, 17 different faculty members were involved in a major way, compared to only seven faculty members during the first grant year. A number of others participated for short periods as appropriate. Hence, there was a considerable expansion of the cadre of faculty members with exposure to the 211(d) program. In addition, more students were involved directly and a substantial number attended the seminar series.

In addition, through the development of such periodicals as the Small Industry Development Network Newsletter (separately funded) and The International Informer, a large portion of the faculty received continuing information on the program. This has resulted in a much greater awareness of the program at both the faculty and student levels.

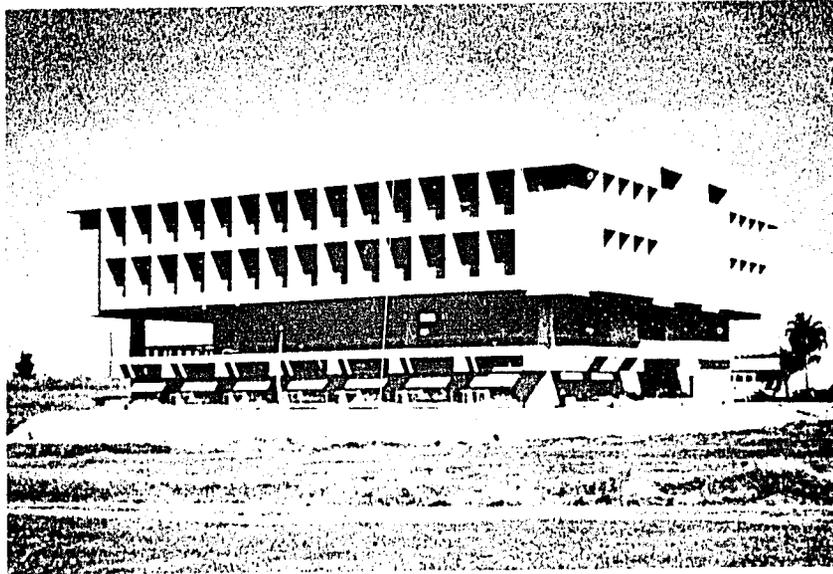
The expansion of applied research activities in the second grant year is manifest from the increased number of published reports and analyses.

Worthy of note is the interest in the program evinced by the Georgia Tech administrative personnel, who have been most cooperative in assisting in program coordination. Both the Institute President and the Vice President for Academic Affairs have gained a firsthand knowledge of the activities through direct interactions with counterpart organizations in Korea and the Philippines. As a result of the 211(d) interaction, the President of Georgia Tech was requested by Soong Jun University in Korea to make the commencement address on January 31, 1975, and was the first recipient of an honorary doctorate in the history of the institution.

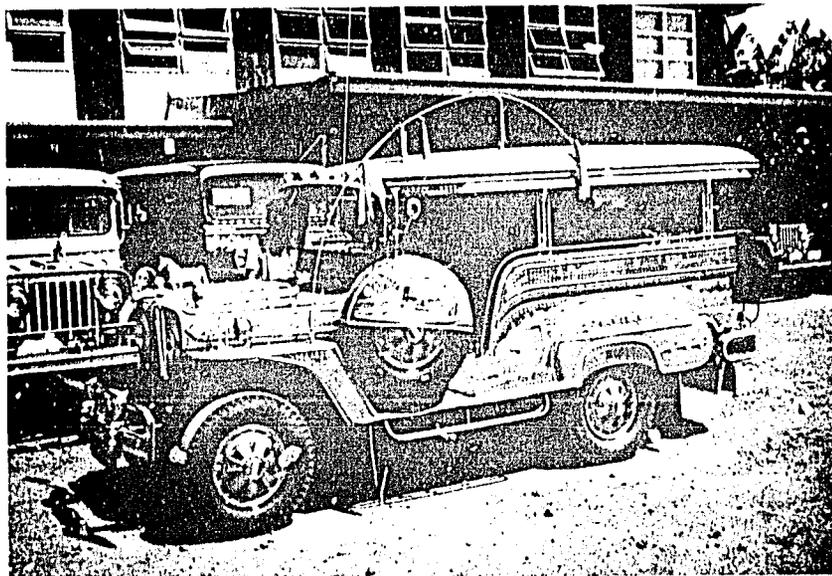
Awareness of the program among other organizations also has expanded greatly, resulting in many requests for information about the program and inquiries about direct assistance or technical information. The number of foreign observers who visited the program in the reporting year has tripled over the previous year.

Because of administrative support and free flow of program information, no problems in grant management and impact have been encountered to date. A continued expansion of faculty and student participation is anticipated in future grant years.

PHILIPPINES

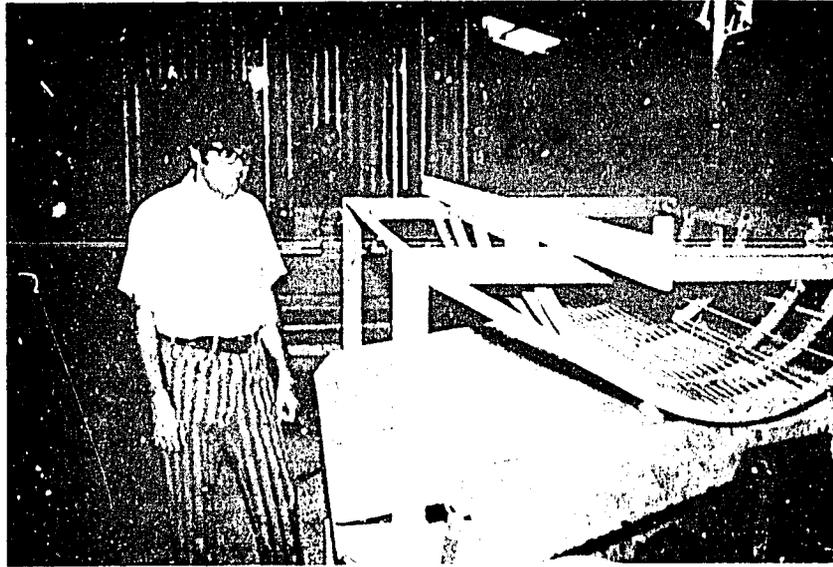


The new building housing the Institute for Small-Scale Industries (ISSI) on the University of Philippines campus. Finished in early 1975, this excellent facility contains offices, display space, a library, and classroom and laboratory space. ISSI is involved in the small-scale industry counterpart network.

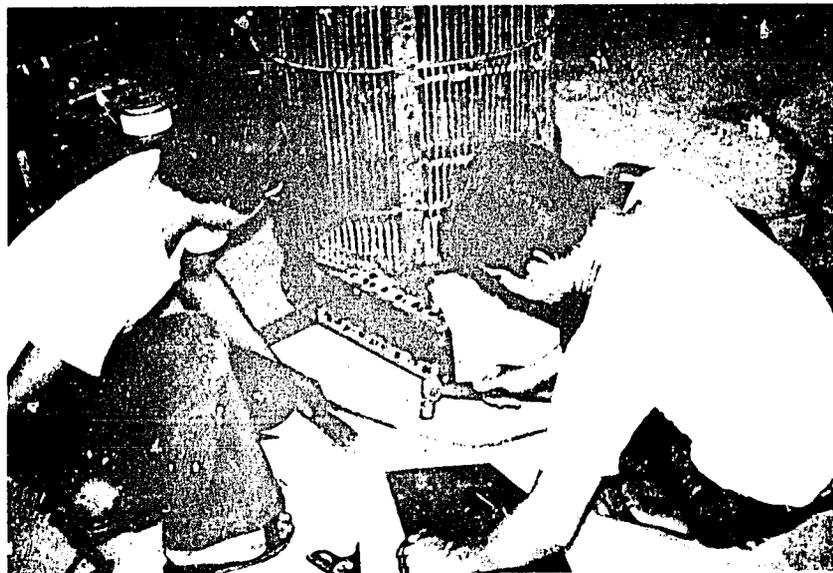


The "Jeepney" is a primary means of public and private transport in the Philippines. Here are shown completed Jeepneys at one of the Manila manufacturers of this vehicle. Production of this colorful descendant of the World War II Jeep is a widely diffused small-scale industrial operation.

PHILIPPINES



Dr. Amir Khan, of the International Rice Research Institute (IRRI) in Los Baños, Philippines, shown standing beside rice machinery designed and built at IRRI. The IRRI designs are now widely manufactured in the Philippines.



A small machine shop in the Philippines, employing 14 persons and producing three IRRI-designed axial flow threshers per month at the time the facility was visited. At this level of production, the entrepreneur makes an excellent profit and competes successfully against imported machinery. With extremely simple tools and little machinery in the plant, metal fabrication is a labor-intensive activity.

However, it should be noted that external circumstances beyond the control of Georgia Tech had some impact on program scheduling and activities. For the most part, these circumstances were minor and have been mentioned in various parts of this report. In summary, they are:

- (1) The flood in southern Brazil, which destroyed many buildings in Tubarao and damaged the counterpart organization there, created a three-month hiatus in interaction with FESSC, the counterpart.
- (2) The lack of interest of the Kenya counterpart, the Kenya Industrial Estates, in entering into a cooperative agreement with Georgia Tech led to an informal relationship and very little activity.
- (3) A number of field trips were canceled or postponed because of advice from AID missions or other factors. In Brazil, for example, difficulties in obtaining visas for U.S. citizens born in what are now communist countries caused three scheduled trips to visit FESSC to be postponed and resulted in changes in personnel assignments. This visa situation has now eased.
- (4) The postponement, at the request of the Nigerian counterpart, of the field testing of a training program titled "Analysis and Evaluation of Industrial Projects" made it impossible to complete this goal in the reporting year.

Perhaps the most visible impact of the 211(d) grant on Institute activities is the proliferation of grants and contracts for various small industry projects which has occurred during the reporting year. These items are reported in the next section.

VI. OTHER RESOURCES FOR GRANT-RELATED ACTIVITIES

A. Related Grants and Contracts. The 211(d) grant to Georgia Tech has led directly or indirectly to a number of related grants and contracts with AID and other organizations. These are listed below:

(1) *Small Industry Grant Contract.* This AID-sponsored activity involves Georgia Tech in administering grants to two counterpart organizations to expand viable small industry technical assistance programs. Georgia Tech and the East-West Center (Hawaii) also provide small industry-related training and consultation to the counterparts under this program. It is a five-year program which

may be extended to other organizations in the future. The first-year contract was for \$100,000, of which Georgia Tech utilized \$51,000, the East-West Center, \$4,000, and two counterparts, \$45,000.

(2) *Small Industry Development Network* (a quarterly newsletter). This newsletter focusing on small industry development in the developing countries has been well received, and requests to be put on the mailing list continue to mount rapidly. By the third issue of the first year, the mailing list had grown to 800, approximately double the number anticipated for that issue. The two-year funding by AID for this publication amounts to \$17,500.

(3) *Basic Ordering Agreement* (AID and Georgia Tech). This agreement has been utilized to fund Tech participation in a survey of the Dominican Republic to ascertain the feasibility of manufacturing, in that country, rice machinery designed by the International Rice Research Institute (IRRI). The success of this survey has led to further development of this manufacturing capability. Participation in this short survey involved funding of \$1,900 by AID.

(4) *Organization of American States (OAS) Ecuador Survey*. At the request of OAS, a small industry specialist participated in an OAS team survey of Ecuador related to the next five-year development program of that country. Time of the Tech participant was provided under the 211(d) grant, and this led to a comprehensive report to OAS and a published report under the 211(d) program (listed in Appendix I). OAS contributed travel funding for this project amounting to \$1,430.

(5) *Assistance to CONACYT (Mexico)*. As a result of the 211(d) activity, representatives of CONACYT in Mexico visited IDD in Atlanta and asked for short-term consulting assistance in its information system program. An information scientist was provided for this purpose, and further substantive interactions are being negotiated. Funding to date by CONACYT amounts to \$1,045.

(6) *International Development Conference/Seminar*. AID has funded a conference/seminar titled "Techniques and Methodologies for Stimulating Labor-Intensive Small Industries in Developing Countries." The meeting was held March 10 through March 14, 1975, in Atlanta. The conference attendance was approximately 120 and the seminar (by invitation only) was restricted to 20 participants, most of whom came from developing countries. AID and Georgia Tech funding amounted to \$30,000.

NIGERIA

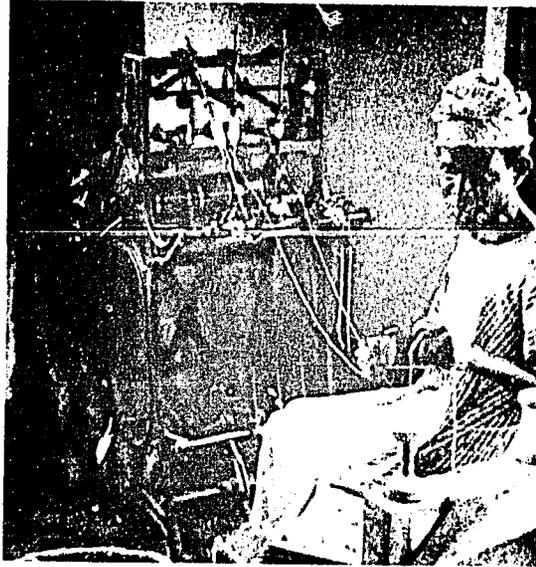


A planing machine and operator of Oluwa Nipe Koyeni Wood Works, a labor-intensive furniture manufacturer in Ile-Ife. This firm was assisted in identifying loan resources in Nigeria.

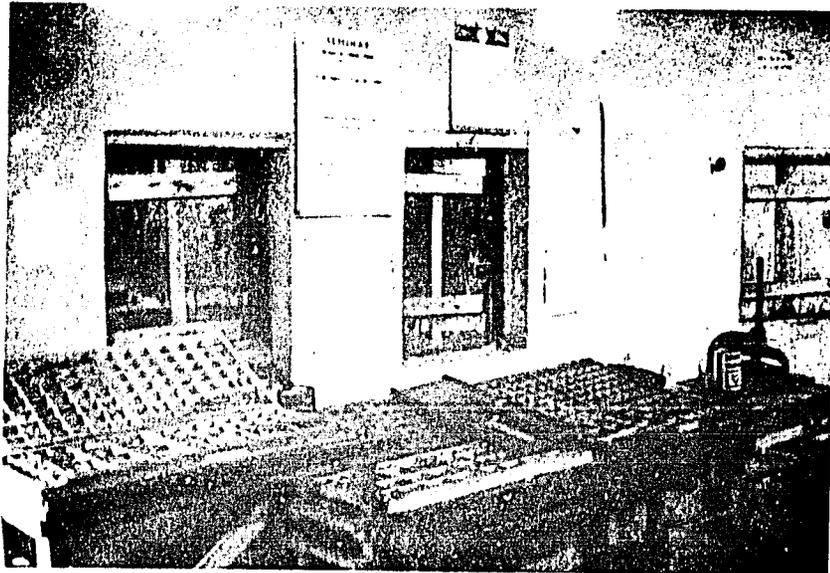


Edward A. Nelson, Jr., of IDD, visits Oyo Cooperative Leather Works as part of a survey to identify marketing, production, and basic management problems of small-scale industrialists in Nigeria. This firm is located in Oyo, Nigeria.

NIGERIA



A textile machine operator at Ifelodun Weaving Society in Oyo, Nigeria. This industry was assisted by the Industrial Research Unit at the University of Ife, a counterpart institution under the Georgia Tech 211(d) grant.



The typesetting operation of Kosalabaro Press, a printing company in Ile-Ife, Nigeria, assisted by the Industrial Research Unit in preparing a loan package request to the Federal Government of Nigeria.

(7) *AID Small Industry Loan to the Government of Colombia.* On three separate occasions, Tech personnel were involved in Colombia, in the provision of assistance to AID/Bogota in developing a small industry loan package and in reviewing the package with appropriate Colombian officials. Tech has been informed that the loan has been approved and the associated activities are being implemented. A team of seven individuals from Colombia spent a number of days in Atlanta interacting with the Industrial Development Division in connection with this loan implementation. AID funding for Georgia Tech amounted to \$8,700.

B. Georgia Tech Support for 211(d) and Associated Activities. In addition to having excellent administrative support and institution cooperation, the international development activities at the Industrial Development Division have been supported by \$32,000 of direct funds and \$14,000 in professional development funds (Spanish language training).

C. Possible Additional Future Involvements. Discussions and, in some cases, negotiations are being conducted with various AID units relative to possible projects, as follows:

- Small industry assistance in the Philippines
- Utilization projects concerning IRRI-designed rice machinery and the Battelle-designed water pump
- Hosting an Atlanta AID symposium
- Expansion of the Small Industry Grant contract to include additional grantees

Discussions on possible contracts with non-AID organizations are being held in Colombia, Nigeria, and Mexico. Expressions of interest have been received from a number of other sources.

A number of discussions with the World Bank have been held to ascertain how Georgia Tech might assist or be supportive in various small industry loan projects, either directly or through in-country counterpart organizations.

VII. UTILIZATION OF INSTITUTIONAL RESPONSE CAPABILITIES IN DEVELOPMENT PROGRAMS

The following items have been reported in sections of this report, but the salient features are repeated below in conformance with the suggested AID format.

While no attempt was made during the reporting year to record all requests for information and/or assistance, correspondence and other files give some measure of this activity. The following table shows the estimated number of

information and technical assistance requests which were serviced and the sources of the requests.

<u>Users</u>	<u>Number of Requests or Inquiries</u>
IDD staff personnel	1,200
Other EES staff	25
Georgia Tech and other faculty	10
Georgia Tech and other students	100
Other U.S. organizations	25
Foreign organizations or individuals	100
Counterpart institutions:	
Information	25
Report distribution	500
Visitors and interns	60

Because of the volume of these requests and responses, it is impractical to list each one separately. Table III-A, under separate submission, lists the major technical assistance requests and the responses made to these requests.

The graduate students presently enrolled in the master's program on industrialization are identified by country of origin in Appendix II. No one has completed the master's program funded by the 211(d) program as yet, because the two-year program was initiated in September 1974.

Forty-five foreign visitors spent from one day to five weeks visiting the Industrial Development Division for the purpose of observing the program or for on-campus consultation.

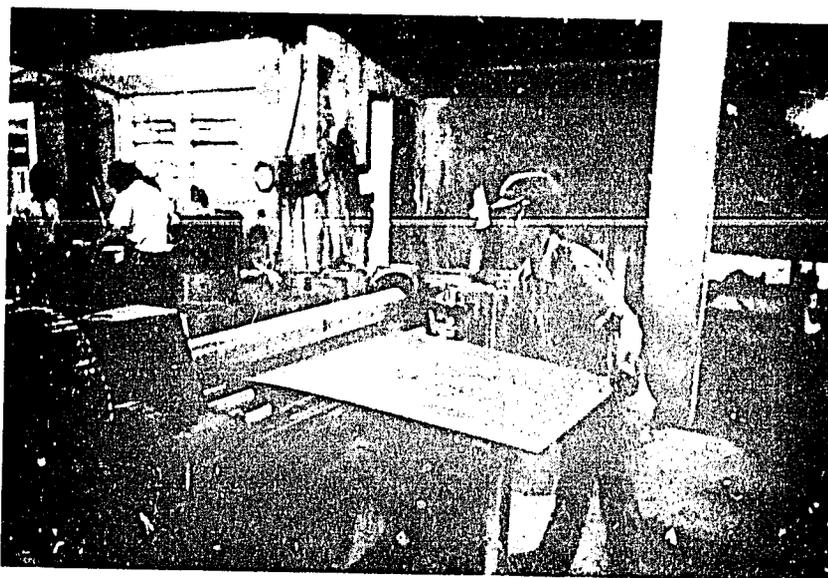
Many of the reports (research studies, directories, etc.) generated by the 211(d) program were distributed during the year to counterpart and other organizations (500 copies of published reports in all).

Professional staff members and faculty of the Georgia Institute of Technology who have participated in substantial development activities under the 211(d) grant or associated contracts and grants are listed in Table 4. (This does not include Tech faculty or staff involved in other unrelated international education or development activities.)

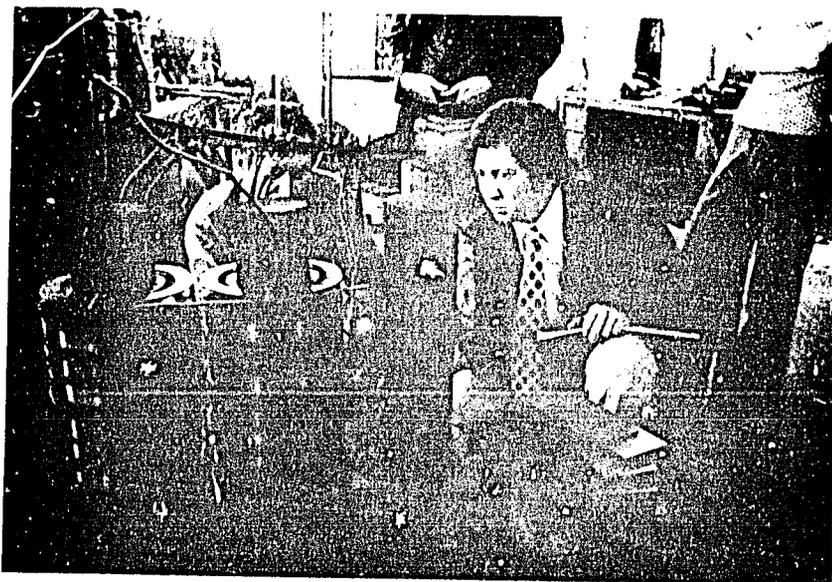
Table 4
 PROFESSIONAL PERSONNEL WORKING ON
 211(d)-ASSOCIATED DEVELOPMENT PROGRAMS

<u>Name</u>	<u>Title</u>
Auciello	Assistant Research Scientist
Chu	Professor
Clifton	Research Scientist
Collier	Senior Research Scientist
Cornman	Research Scientist
Crawford	Vice President for Academic Affairs
Deadmore	Research Scientist
Eller	Professor
Fyffe	Professor
Hammond	Chief, Industrial Development Division, EES
James	Senior Research Engineer
Johnston	Research Scientist
Kaatz	Professor
Lewis	Principal Research Scientist
Lodge	Senior Research Scientist
Logan	Senior Research Engineer
Morelos	Research Scientist
Nelson	Research Scientist
Parets	Research Engineer
Pettit	President, Georgia Institute of Technology
Potts	Research Scientist
Stephens	Lecturer
Studstill	Research Engineer
Wagenveld	Assistant Research Scientist
Wall	Senior Research Engineer

BRAZIL

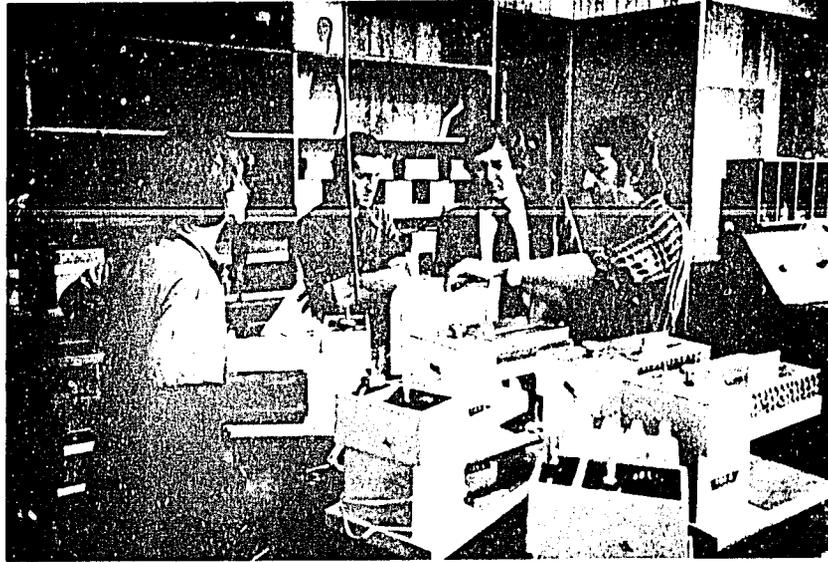


A Tubarao manufacturer of pug mills for the ceramics industry received valuable help from FESSC's small and medium-size industry development program. Assistance was provided in plant layout, organizational restructuring, and cost control and accounting methods. This firm doubled its labor force during 1974 from 30 to 60 employees.



A small transformers manufacturing firm located in the coastal community of Laguna was assisted in solving some of its production and accounting problems. Here IDD's George A. Morelos discusses with the owner some of the core components that can be more economically obtained through other machine shops in the area, thus stimulating a multiplier effect.

BRAZIL



A home appliance manufacturer from Tubarao received advice from FESSC in relation to the introduction strategy and marketing of a new meat cuber. The assistance also included methodology for the testing of this new model, as well as setting up quality control standards at the production line.



An integral component of the small and medium-size industry development program is community development. Here, in a meeting presided over by Mr. Jose Muller, Head of FESSC's Research and Development Department, matters pertaining to industrial incentives and the establishment of industrial districts at the community level are discussed with representatives of the Federal Department of Interior.

VIII. NEXT YEAR'S PLAN OF WORK AND ANTICIPATED EXPENDITURES

The preliminary targets and allocation of effort to third grant year activities are as follows:

	<u>Verification Means</u>
<u>Applied Research</u> (40% of effort -- \$72,000)	
● Industry studies (2)	Reports
● Economic analysis	Report
● International market potential analysis	Report
● Expansion of "Guidelines for Industrial Extension Personnel"	Additional guidelines
● Expansion of International Development Data Center holdings	New materials
● Continued compilation and codification of small industry case histories	Expanded Case History Index
● Comparative analysis of counterpart country financing programs	Report
<u>Education and Training</u> (25% of effort -- \$42,000)	
● Increase numbers of students in industrialization master's curriculum to 12	Enrollment
● Support of graduate program students as needed	Dollar support
● Presentation of new course in graduate program	Presentation
● Development of new training program	Training program package
<u>Conferences and Seminars</u> (15% of effort -- \$27,000)	
● Six or more seminars by invited lecturers	Seminars
● Participation in relevant conferences and seminars by staff	Papers
● International Development Seminar (called for in grant but request is being made to postpone until April 1976)	Seminar
<u>Counterpart Linkages</u> (10% of effort -- \$18,000)	
● Frequent communication with counterparts	Files
● Possible selection of additional counterpart	New counterpart
<u>Administration and Coordination</u> (10% of effort -- \$18,000)	
● Planning and coordination, internal	Annual report
● Communication with AID and other organizations	Files
● Two Internal Advisory Committee meetings	Meetings
● One External Advisory Committee meeting	Meeting
● Twelve program staff coordination meetings	Meetings
● Schedule visits and receive foreign observers	Visits

IX. INVOLVEMENT OF MINORITY PERSONNEL AND WOMEN

During the second grant year, a substantial number of minority and female staff members have been involved in the 211(d) grant activity and associated international development activities. These persons are listed on the next page (Table 5).

No problems have been encountered in involving minority or female professionals or support personnel in international development activities. In general, their performance has been excellent. Further involvement of minority and female professionals and support personnel is anticipated as the grant activity continues, including overseas field trip assignments.

X. OTHER

A. By-Product Activities. The 211(d) activity has been the genesis of or a contributor to a number of Georgia Tech activities, including:

(1) Participation by President Joseph Pettit (as chairman) and Ross Hammond (as a member) on a National Academy of Science panel, "The Role of U.S. Engineering Schools in Foreign Assistance."

(2) The Asian Institute of Technology (AIT) had proposed a three-year research project titled "New Perspectives for Industrialization in Asia," which would involve Georgia Tech and the Indian Institute of Management. Some preliminary work had been done by Georgia Tech on this project, but due to several administrative changes at AIT, this project is now held in abeyance, pending clarification.

(3) The obvious and continuing need for greater IDD staff competence in Spanish, so that the Division might be more responsive to technical assistance requests in South America, led to the establishment of a six-month intensive training program in conversational Spanish for ten IDD professionals. The associated training costs (about \$14,000 for instruction and the time of participants) were funded by Georgia Tech.

B. Impact of Institute Activities on Counterpart Planning and Projects. The 211(d) grant at Georgia Tech and some of the synergistic AID-funded activities have impacted on a number of counterpart projects.

(1) The Tech activities with FESSC in Brazil and Soong Jun University in Korea have facilitated the changes in the internal organization of these two counterparts needed to develop specific programs of small industry assistance.

Table 5

INVOLVEMENT OF MINORITIES AND FEMALES
(Georgia Tech 211(d) and Associated Programs)

<u>Name</u>	<u>Title</u>	<u>Origin</u>	<u>Sex</u>	<u>Nature of Involvement</u>
Auciello	Asst. Res. Sci.	-	F	International Development Data Center information scientist
Camp	Secretary	Spanish Am.	F	International Development Branch secretary
Chu*	Professor	Oriental Am.	M	Economic analysis and reports
Correal	Student Asst.	Colombian	M	International Development Data Center
Deadmore*	Res. Scientist	-	F	SIDN newsletter editor -- participates in 211(d) activity
Gochicoa	Graduate Asst.	Mexican	M	International Development Data Center -- research
Hurd	Clerk Typist	-	F	Processes program material
Jaramillo	Graduate Asst.	Colombian	M	International Development Data Center -- research
Kim	Graduate Asst.	Korean	M	Training assistant
Morelos*	Res. Scientist	Spanish Am.	M	Responsible for project implementation and industrial problem solving
Nelson*	Res. Scientist	Black	M	Industrial problem solving
Parets*	Research Engr.	Spanish Am.	M	Responsible for project implementation and problem solving
Seminario	Graduate Asst.	Peruvian	M	International Development Data Center -- development of new graduate course
Sheppard	Clerk	Black	F	Typed program material
Textor	Secretary	-	F	Assists in project administration and coordination
Udunka	Asst. Res. Sci.	Black	F	Audiovisual specialist
Wagenveld	Asst. Res. Sci.	-	F	International Development Data Center -- general data collection duties
Wall*	Sr. Res. Engr.	Spanish Am.	M	Responsible for project development, planning, implementation
Williams	Secretary	-	F	International Development Data Center secretary

*Involved in international travel under 211(d) or other associated programs in reporting year.

(2) Research on the need for an industrial engineering curriculum at Soong Jun University was instrumental in obtaining the approval of the Ministry of Education for establishment of an Industrial Engineering Department at the University.

(3) The Korean National Cabinet has received a favorable report on the cooperative agreements between Soong Jun University and the Yong Dong Po Industrial Estates and the Taejon Chamber of Commerce and Industry.

(4) As part of its small industry program, the University of Ife has initiated a network of six field offices with the establishment of the first industrial extension office in Ile-Ife. This followed a 10-day fact-finding visit by Professor Samuel Aluko of Ife University to IDD and its industrial extension offices in Georgia. This industrial extension program had been planned by the University for some years, and its implementation is a significant milestone.

(5) A number of the counterpart organizations have been successful in generating outside sources of funding, in part due to the small industry operations being generated by these organizations. Additional proposals for small industry activity have been prepared and submitted to various funding sources by the counterpart organizations.

Appendix I

ACCUMULATIVE LIST OF PUBLISHED MATERIALS PRODUCED UNDER
THE GEORGIA TECH 211(d) PROGRAM

ACCUMULATIVE LIST OF PUBLISHED MATERIALS PRODUCED UNDER
THE GEORGIA TECH 211(d) PROGRAM

<u>Report Title</u>	<u>Nature of Publication</u>	<u>Distribution</u>
1. Case History -- Small-Scale Industry Development in Paraguay (February 1974)	Report	General
2. List of Subject Headings Used by the International Development Data Center (February 1974)	Report	General
3. An Educational Program with Emphasis on Industrialization Leading to the Degree of Master of Science	Report	General
4. Employment Generation through Stimulation of Small-Scale Industry	Brochures (2)	General
5. An Overview of the Development and Current Operations of the Industrial Development Division	Paper	General
6. Technology Transfer Systems for Small Industries	Paper	General
7. Staff Travel Information (undated)	Report	Internal only
8. Benefits and Problems Associated with University-Industry Interaction - A Case History	Paper	General
9. First Annual Report - 211(d) Grant Year (February 23, 1973-February 22, 1974)	Report	General
10. The Promotion of Industrial Development in Ecuador (August 1974)	Report	Internal only
11. The Prospect for Economic Development in Nigeria (April 1974)	Report	Internal only
12. The International Informer	Monthly Newsletter	Internal and limited external
13. A Comparative View of Technology Transfer	Paper	General
14. Curricula Research and Development (Korea, July 1974)	Report	General
15. Guide to International Statistical Sources and National Development Plans at the International Development Data Center (October 1974)	Report	General

ACCUMULATIVE LIST OF PUBLISHED MATERIALS PRODUCED UNDER
THE GEORGIA TECH 211(d) PROGRAM
(continued)

<u>Report Title</u>	<u>Nature of Publication</u>	<u>Distribution</u>
16. Some Issues Related to the Impact of Micro-Development Projects	Paper	General
17. Guidelines for Industrial Extension Personnel (November 1974)	13 Guideline Papers	General
18. Improving the Productivity of a Small Industry in Rural Korea (December 1974)	Report	General
19. An International Compilation of Small-Scale Industry Definitions (January 1975)	Report	General
20. Provisional Keyword Index of the Small-Scale Industry Case Studies (February 1975)	Report	General
21. Small-Scale Industry Development in Ecuador - A Case History (April 1975)	Report	General
22. Second Annual Report - 211(d) Grant Year (February 23, 1974-February 22, 1975)	Report	General
23. A Seven-Country Survey of Certification Licensing and Quality Marks Programs (March 1975)	Report	General

Appendix II
Progress Report

MASTER'S PROGRAM WITH EMPHASIS ON INDUSTRIALIZATION

Progress Report
MASTER'S PROGRAM WITH EMPHASIS ON INDUSTRIALIZATION
(Supported by the Georgia Tech 211(d) Grant)

At the start of the Fall Quarter 1974, the School of Industrial and Systems Engineering initiated an educational program with emphasis on industrialization leading to the Master of Science degree.

Program Objectives

The main objective of the program is to enable students who are interested in industrialization to develop awareness in setting up small industries so as to create long-lasting employment opportunities. More specifically, the program has been planned to provide practical education at the graduate level for students who are interested in any of the following:

- Creation and management of small industry
- Professional employment in an industrial development organization
- Teaching industrialization technology

Program Requirements

Entering students are expected to have completed the bachelor's degree (preferably in engineering, science, or management) and to have graduated in the upper half of their class. In addition, each applicant must demonstrate a mastery of the English language as evidenced by a score of at least 500 on the TOEFL exam.

After admission to the Graduate Division and a discussion of their professional objectives with an advisor, students are given the option to select their own courses from prepared lists in each of the following areas:

- *Financial Resources*
To provide knowledge concerning the acquisition and management of the financial resources of a business.
- *Plant and Equipment Resources*
To provide knowledge of how to perform site selection, facilities design and layouts, process design and management functions for any industrial setting.

- *Human Resources*

To develop an understanding of human relations in an industrial organization, i.e., how individual and group behavior affects and is affected by the work environment.

- *Information and Control Systems*

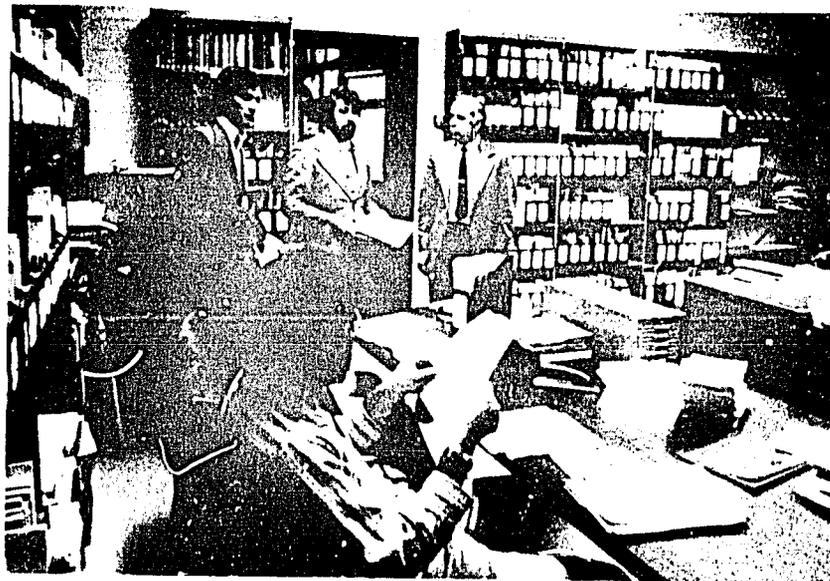
To introduce the concept of information needs to business management and to provide background knowledge pertaining to the design of management information and control systems.

- *Management of Improvement and Innovation*

To provide the necessary knowledge for systematically identifying significant problems, needs, and opportunities for improvement and for managing the implementation of technical change.

Finally, students (in addition to the classroom courses) are required to complete a project which will provide a carefully guided practical experience related to industrialization. Possible projects include the planning for creation and implementation of a small-scale business, or for the development of a specific region.

Student Enrollment



Graduate program participants (from front to back) Jaime Jaramillo, Gerardo Gochicoa, Jorge Arguelles, and Antonio Quezada are shown in the International Development Data Center with Professor David Fyffe.

Four students entered the program when it was initiated at the start of the Fall Quarter 1974. All are from Latin American countries, but their backgrounds and professional interests are quite different.

Mr. Antonio Quezada is a chemical engineering graduate from the Escuela Politecnica Nacional in Quito with industrial experience in several Ecuadorean firms. More important, prior to coming to Georgia Tech he was employed by the Centro de Desarrollo Industrial del Ecuador (CENDES), which is one of Georgia Tech's counterpart organizations under the 211(d) program. Following completion of his Master's degree, Mr. Quezada plans to work in Ecuadorean development (possibly CENDES) and hopes to teach industrial engineering at the Escuela Politecnica Nacional.

Mr. Jaime Jaramillo is from Colombia and began his university education at the Universidad Nacional de Colombia. After six semesters, he transferred to the State University of New York at Buffalo, where he completed the B.S. in Industrial Engineering. Mr. Jaramillo's interest in industrial engineering arose from his post high school work experience in a small factory where he was supervisor of production. After completion of his educational program, he would like to return to Colombia and establish his own consulting firm to serve small industries.

Both Mr. Gerardo J. Gochicoa and Mr. Jorge E. Arguelles are from Mexico and are graduates of the Instituto Tecnologico y de Estudios Superiores de Monterrey. Mr. Gochicoa received his B.S. in mechanical engineering. He has two brothers who are Georgia Tech graduates and he expects to return to Mexico after completion of his Master's program. Mr. Arguelles is a chemical engineering graduate. He would like to return to Monterrey and assist in the development of that region.

Each of these students has selected courses consistent with program requirements. Each, however, also has planned to meet his own professional objectives. A sample individual program of study is shown in Attachment A.

New Courses and Course Development

One new course, developed specifically for this program, has been taught since March 1974 and a second is now in the planning stage. In addition, an existing course in the School of Industrial and Systems Engineering has been modified to better serve the program objectives.

During the Spring Quarter 1974, the new course, "Analysis and Evaluation of Industrial Projects," was taught for the first time. This course deals with the economic feasibility analysis of new ventures. It is planned in response to the needs of students who expect to start a small business or work as professionals in an industrial development organization. The objective is to provide knowledge concerning methods for assessing the economic feasibility of industrial projects with due regard for social, cultural, and environmental factors within the region or country in which the venture will be located. A detailed course outline, along with student comments about the course, is shown in Attachment B.

An existing course in the School of Industrial and Systems Engineering, ISyE 6213 - "The Design of Manufacturing Enterprises," was modified by Dr. Tom Clark to build upon the new feasibility analysis course and is being taught by Dr. Clark during the Winter Quarter 1975. The purpose of this course is to provide knowledge of the planning and design work required to implement a manufacturing project. Student project teams select a product, make sales forecasts, select materials and processes, design organizations and management systems, and make projections of capital requirements. A course outline is shown in Attachment B.

Another new course, now under development, is entitled "Projects in Small Industry Development." The objective of this course is to teach students how to provide technical assistance to small firms, that is, to develop the student's ability to diagnose profitability problems in small firms and to formulate and "sell" necessary changes to correct these problem situations. The course will focus on projects with small firms in Georgia. If possible, these firms will be selected in cooperation with the Small Business Administration so that actual problem situations can be studied. The proposed course description is shown in Attachment B.

Program Promotion

Since March 1974, the Master's Program with Emphasis on Industrialization has been widely publicized both in the U. S. and in AID-assisted countries. Program announcements were distributed through the following:

- AID education officers
- Department heads of all schools of industrial engineering in the United States (two mailings)

- Heads of counterpart organizations (i.e., FESSC, Brazil; CENDES, Ecuador; Soong Jun University, Korea; UP-ISSI, Philippines; University of Ife, Nigeria)
- Georgia Tech graduates from developing countries
- Department heads of selected engineering schools in the United States (approximately 100)

Also, several copies of the program brochure, which provides detailed information on the program objectives and requirements, were furnished to Peace Corps officials for distribution to potential students now serving in the Peace Corps.

In addition to these mail distributions, Dr. David E. Fyffe and other Georgia Tech representatives have visited the following organizations and discussed the program with interested officials and potential students. The countries visited and organizations contacted are listed below:

- Brazil
 - FESSC
 - University of São Paulo
- Ecuador
 - CENDES
 - Escuela Politecnica Nacional
- Korea
 - Soong Jun University
 - Korean Institute of Advanced Science
 - Korea Institute of Science and Technology
- Philippines
 - University of the Philippines Institute for Small-Scale Industries
 - University of the Philippines School of Industrial Engineering

An announcement of the Master's Program appeared in Training Information Notice, Nos. 36, 37, 38, and 39, published by the United Nations Commission for Africa in 1974.

These efforts to publicize the program have resulted in many inquiries. At this early date three applications have been received for Fall 1975 admission.

Student Financial Assistance Needs

As program enrollment increases, it is clear that student financial support will be a severe limiting factor. During the academic year starting September 1974, two students are being supported by Graduate Research Assistantships funded from AID 211(d) Project funds, one student is being supported by an IES scholarship under the Fulbright/Hayes Act, and one student is receiving no financial support. During the 1975-1976 academic year, it is estimated that at most four students can be supported by Graduate Research Assistantships funded from AID 211(d) Project funds.

It is clear that additional student financial support is needed in order for the program to fulfill the need for which it was planned. Enrollment for the 1975-1976 academic year is estimated at twelve students. The present level of support will provide financial assistance to only five. Additional support funds must be sought.

Other Needs

In order for the program to develop to the point where it is a viable, self-sustaining program at Georgia Tech, the following are required:

- *Additional Georgia Tech Faculty Involvement*

Participation of additional faculty members would stimulate faculty interest and enhance the program. This can be accomplished through participation in visits to counterpart institutions and developing countries, student counseling, and course planning. The 211(d) grant, however, provides for only one-half time of one faculty member in the School of Industrial and Systems Engineering on behalf of the Master's Program.

- *Program Development*

As stated earlier, one new course has been developed and taught and a second new course presently is being planned and will be taught during the coming year. There is a need, however, for additional courses which are specifically relevant to industrialization in developing countries. An example is a case study course -- possibly taught by visiting faculty from a counterpart institution.

- *Visiting Faculty*

In addition to providing instruction in specific courses relevant to developing countries, visiting faculty members from counterpart

institutions or other educational institutions in developing countries undoubtedly would stimulate interest in development within the Georgia Tech community.

● *Graduate Student Recruitment*

In order for the program to establish permanency, there must be sufficient interest as evidenced by student enrollment to justify allocation of resources to carry on the program. While there is no "cut-off" number, it appears reasonable that 12-15 students would be a minimum requirement.

Plans for the Coming Year

First priority will be given to student recruitment and obtaining financial assistance for students. A request for additional student assistance will be made at AID, and an instructional package will be developed to provide prospective students with information concerning sources of scholarships and how to make application for such support.

Second priority will be given to increasing the faculty base for the program. Involvement of at least one additional faculty member in the School of Industrial and Systems Engineering is one possibility. Visiting faculty is another. Both of these will be explored.

Thirdly, the expansion of the Master's curriculum will be continued with the introduction of the new course "Projects in Small Industry Development."

Attachment A
TYPICAL STUDENT PROGRAM OF COURSE WORK

SCHOOL OF INDUSTRIAL AND SYSTEMS ENGINEERING
MASTER'S PROGRAM WITH EMPHASIS ON INDUSTRIALIZATION
STUDENT PROGRAMS OF COURSE WORK
1974-1975

Jaime Jaramillo

Financial Resources:

ISyE 6212 - Analysis and Evaluation of Industrial Projects
Mgt. 6060 - Financial Management I

Plant and Equipment Resources:

ISyE 4070 - Fundamentals of Operations and Facilities Design
ISyE 6524 - Material Flow Systems
ISyE 6213 - The Design of Manufacturing Enterprises

Human Resources:

Mgt. 6100 - Organization Processes
ISyE 6218 - Work Systems Design

Information and Control Systems:

ISyE 6305 - Forecasting Systems
Mgt. 6300 - Marketing Management I

Management of Improvement and Innovation:

ISyE 6107 - Management of Improvement
ISyE 4035 - Project Management Systems
ISyE 6806 - Introduction to Feedback Dynamics
ISyE 6103 - Organizational Decision Making

Electives:

ISyE 6400 - Design of Experiments
ISyE 6225 - Advanced Engineering Economy
ISyE 6306 - Inventory Systems
ISyE . . . - Design of Manual Management Information Systems

Attachment B
NEW COURSES AND COURSE DEVELOPMENT

1. ISyE 6211 - "Analysis and Evaluation of Industrial Projects"
Course Outline and Student Comments
2. ISyE 6213 - "The Design of Manufacturing Enterprises"
Course Schedule
3. Proposed Course - "Projects in Small Industry Development"
Course Outline

ISyE 6211

ANALYSIS AND EVALUATION OF INDUSTRIAL PROJECTS

DESCRIPTION: This course deals with the economic feasibility analysis of new ventures and other industrial projects. Starting with the generation of ideas for new ventures, all steps involved in feasibility analysis are covered. The final topic is the preparation of the request for funding.

OBJECTIVE: The course is planned in response to the needs of students who expect to start a small business or work as professionals in an industrial development organization. The objective is to provide knowledge concerning methods for assessing the economic feasibility of industrial projects with due regard for social, cultural and environmental factors within the region or country in which the venture will be located.

<u>OUTLINE:</u>	<u>Topic</u>	<u>Class Hours</u>
	1.0 Introduction	1
	2.0 Generation and Selection of Venture Ideas	3
	2.1 A checklist of approaches suitable for the entrepreneur	
	2.2 Approaches for the development planner	
	3.0 Demand Forecasting	4
	3.1 Estimating the potential market and the available market	
	3.2 Forecasting sales	
	4.0 Product Pricing	2
	4.1 Policy objectives	
	4.2 Approaches to product pricing	
	5.0 Site Selection	2
	5.1 Factors in site selection	
	6.0 Resources and Technical Analysis	8
	6.1 Production	
	6.1.1 Process design	
	6.1.2 Equipment needs	
	6.1.3 Materials requirements	
	6.1.4 Labor requirements	
	6.1.5 Administrative functions	
	6.2 Cost estimating	
	6.2.1 Investment costs	
	6.2.2 Operating costs	
	6.2.3 Start-up costs	

	<u>Topic</u>	<u>Class Hours</u>
	7.0 Project Evaluation	4
	7.1 Economic analysis from the viewpoint of the entrepreneur	
	7.1.1 Measures for economic comparison of alternatives	
	7.2 Project analysis from the viewpoint of the development planner	
	8.0 Preparation of an Application for Funding	2
	9.0 Project Discussions	4
NOTES:	(1) A total of five case studies are used to demonstrate and emphasize several topics.	
	(2) Outside speakers from industry and IDD/EES at Georgia Tech are used for three of the above topics.	
	(3) A project is required (see attached).	
TEXT:	(1) <u>Manual of Industrial Project Analysis in Developing Countries</u> , Vol. 1, Organization for Economic Co-operation and Development, 1972.	
	(2) Selected publications.	

STUDENT EVALUATION OF THE COURSE
"ANALYSIS AND EVALUATION OF INDUSTRIAL PROJECTS"

Spring Quarter 1974
School of Industrial and Systems Engineering

Following are questions concerning the first offering of the course and student response.

Q. AFTER HAVING COMPLETED THIS COURSE, DO YOU FEEL THAT A COURSE COVERING NEW VENTURE ANALYSIS IS USEFUL?

- A. 1. I do feel that a course in new product/new venture analysis is useful. This is an area where the quantitative techniques of industrial engineering can be profitably applied. The course gave me the opportunity to see how a number of these techniques -- forecasting, engineering economy, plant layout, etc. -- could each play a role in the larger problem of determining feasibility.
2. Of course I think this course is useful, especially if the student is interested in developing a new venture.
3. Yes, I feel the material presented in class was very good.

Q. IS THE CONTENT OF THE COURSE, AS IT IS NOW STRUCTURED, APPROPRIATE? WHAT CHANGES WOULD YOU SUGGEST?

- A. 1. I liked the content of the course. I suggest that a small example of each topic at each class be explained; for example, in the "market analysis" topic, a small handout can be prepared for the student "or" assign it to him.
2. The content of the course is completely satisfactory. A good balance was achieved among the important areas. I think the course could be called "New Product/New Venture Feasibility Analysis," with only a slight change in orientation and content.
3. Material presented was fine.

Q. IS THE PROJECT A USEFUL EXPERIENCE? IF YOU FEEL THAT A PROJECT SHOULD BE REQUIRED, ARE THERE CHANGES YOU WOULD RECOMMEND?

- A. 1. A project is a useful experience. It is difficult to do a good project in a one-quarter course; this limitation can be partially overcome if the project tasks are assigned to different members of a team, but this has the disadvantage that each team member only acquires experience in his assigned area.

A project does give a feel for some of the real, nitty-gritty type problems of doing a feasibility analysis. This kind of knowledge is difficult to gain through just studying cases someone else has prepared.

2. I think I would have gained more from several smaller (but extensive) homework assignments. For example, pick a product for which you know data to be available and have students perform a market study.
3. I think the project should be the object of the course. I also suggest a closer contact between the professor and the student (by means of asking a small report each two weeks and helping the student to solve the problems he has with the project).

Q. IS THE TEXT WORTH THE PURCHASE PRICE?

- A.
1. I would not doubt in buying the text, it is very good.
 2. The text is worth the price, if only as a convenient source of cases. It does have some helpful ideas.
 3. The text is fine. It has good data for homework.

ISyE 6213
THE DESIGN OF MANUFACTURING ENTERPRISES

TEXT: None.

SCHEDULE:

Wed. 1/8^{1/} Course introduction and requirements.
Mon. 1/13 Assignment:^{2/} Teams formed and products selected.
Subject: Entrepreneurship and organizational development.
Wed. 1/15 Assignment: Attend SME Exposition.
Mon. 1/20 Assignment: Product designs.
Wed. 1/22 Subject: The processes of planning and controlling.
Mon. 1/27 Assignment: Initial projections of sales and profits for a
three-year period and estimate of capital requirements.
Wed. 1/29 Subject: Forecasting.
Mon. 2/3 Assignment: Materials specifications and production process
design.
Wed. 2/5 Subject: Product ideas and protection.
Mon. 2/10 Assignment: Organizational structure, management/staff job
descriptions, inventory control procedures, and quality
control procedures.
Wed. 2/12 Subject: Sources of professional advice and assistance.
Mon. 2/17 Assignment: Projections of manpower needs, equipment require-
ments, and materials usage with associated costs.
Wed. 2/19 Subject: Sources of capital.
Mon. 2/24 Assignment: Projections of space requirements and costs for
rent, utilities, supplies, and general administration.
Wed. 2/26 Subject: Sources of capital continued.
Mon. 3/3 Assignment: Financial analysis.
Wed. 3/5 Open to be used as needed.
Mon. 3/10 Assignment: Financial sensitivity analysis.

NOTES: 1/ All class sessions are 1 1/2 hours.
2/ All assignments refer to the student projects and indicate student
report topics to be presented in class.

ISyE

PROJECTS IN SMALL INDUSTRY DEVELOPMENT

DESCRIPTION: This course is concerned with problem analysis and technical assistance in small industries. Classroom sessions deal with problem identification and methodology for problem analysis and improvement. In addition, students work on field projects with small firms.

OBJECTIVE: The objective of this course is to develop the ability to diagnose profitability problems in small firms, analyze existing systems, develop improvements, and "sell" necessary changes to correct the problem situation.

OUTLINE: CLASSROOM DISCUSSIONS

1.0 Introduction

1.1 Common problems in small firms

2.0 Analyzing Business Problems

2.1 Indicators and how to interpret them

2.1.1 Productivity and production management measurements

2.1.2 Sales and customer satisfaction measurements

2.1.3 Cost measurements

2.1.4 Employee attitude and morale

3.0 Increasing Productivity

3.1 Factors which affect productivity

3.2 Productivity analysis

3.2.1 Methods in production

3.2.2 Employee efficiency

4.0 Reducing Costs

4.1 Cost factors

4.2 Analyzing cost problems

5.0 Improving Management Control

5.1 Types of management controls usually needed

5.2 Analyzing management control deficiencies

6.0 Improving Customer Service

6.1 Factors which affect customer service

6.2 Analyzing customer service improvement needs

PROJECT: A principal element of the course is the project activity. Working in small project teams, students will assist local small firms in

solving productivity and related problems. Host firms will be selected with the assistance of the Small Business Administration.

TEXT: Selected publications and handouts.

Appendix III
SAMPLE SEMINAR POSTER

INTERNATIONAL DEVELOPMENT SEMINAR SERIES



SEMINAR NO. 13

10:30 am, Monday, June 17

Room 303 (Auditorium)

ENGINEERING EXPERIMENT STATION (957 DALNEY ST.)

Regional Adaptive Technology Center Program and Strategy at Yeungnam University

**Dr. Inge Lee, President and Professor
Gyung-chan Kim, Yeungnam University
Gyongsan, Korea**

**SPONSORED BY: GEORGIA TECH PROGRAM OF EMPLOYMENT
GENERATION THROUGH STIMULATION OF
SMALL SCALE INDUSTRY (IN THE DEVELOPING
COUNTRIES).**

PROGRAM FUNDED BY THE AGENCY FOR INTERNATIONAL DEVELOPMENT

Appendix IV
THE INTERNATIONAL INFORMER

The International Informer



Published by the International Development Data Center, Industrial Development Division, Engineering Experiment Station, Georgia Institute of Technology and produced under U. S. Agency for International Development 211(d) funding support.

This monthly newsletter is intended to inform interested Georgia Tech faculty and counterpart organization personnel of recent acquisitions and current projects of the International Development Data Center (IDDC).

January, 1975

IDDC NEWS

- AN INTERNATIONAL COMPILATION OF SMALL SCALE INDUSTRY DEFINITIONS' expected publication date is February, 1975. This culmination of a year long survey by IDDC will provide approximately 70 country definitions of what constitutes small scale industry.

NEW SERIAL ACQUISITIONS

- A2580 African-American Institute. AFRICA REPORT. Bimonthly.
Each issue contains articles on various aspects of African life - economic, political, cultural, and social. A feature insert, AFRICAN UPDATE, reports on the current economic and political developments in individual African countries.
- A8299 Asia Magazines, Ltd. ASIA MAGAZINE. Weekly.
Sunday feature magazine supplement to newspapers in 8 Asian countries.
- J8632 Columbia University. School of International Affairs. JOURNAL OF INTERNATIONAL AFFAIRS. Semiannual.
Each issue focuses on a central theme. Recent articles include "The Korean Workers' Party and Detente," and "Detente: Impetus for change in Latin America?" Book Reviews.
- J8635 Academy of International Business. JOURNAL OF INTERNATIONAL BUSINESS STUDIES. Semiannual.
Focuses on issues of management, public policy, research, and international business education. Recent articles include "Balance of Payments Costs and Conditions of Technology Transfer to Latin America," and "Methodological Problems in International Comparisons of the Cost of Living." Current joint publisher with AIB is Georgia State University.
- R9480 U. N. Economic Commission for Africa. Voluntary Agencies Bureau. RURAL DEVELOPMENT NEWSLETTER. Quarterly.

Provides information of African rural development. Recent articles include "Successful Ideas for Village Technology," photographs of equipment appended. Quarterly features include description of on-going activities, of voluntary agencies in Africa, workshops, adaptive technology.

- R9482 American Council on Education Overseas Liaison Committee. RURAL DEVELOPMENT NETWORK BULLETIN. Irregular.

"The RDN BULLETIN, ... will focus on a wide range of rural development activities which seek to improve the lives of the rural people in developing nations. Emphasis will be given to applied research and action programs. It is designed to facilitate interregional contacts among scholars, researchers, administrators and practitioners involved in rural development throughout the world."

- S1870 Ahmadu Bello University. Institute for Agricultural Research, Samaru. SAMARU AGRICULTURAL NEWSLETTER. Monthly?

Published " ... to give extension workers information on the progress of research and to provide a forum where all those interested in the development of agriculture in Nigeria can discuss matters of moment." Recent articles include "The Collection and Preparation of Diseased Plant Material for Identification," and "Evaluation of Ariana Equipment."

SELECTED ITEMS CATALOGED BY IDDC DURING THE MONTH OF DECEMBER, 1974.

ACCOUNTING

- 51258 Intermediate Technology Development Group, Ltd. Ministry of Overseas Development. CO-OPERATIVE ACCOUNTING. I. THRIFT AND CREDIT CO-OPERATIVES. 1970.
- 51259 Intermediate Technology Development Group, Ltd. Overseas Development Administration. CO-OPERATIVE ACCOUNTING. II. CONSUMER CO-OPERATIVE SOCIETIES. 1971.
- 51260 Intermediate Technology Development Group, Ltd. Overseas Development Administration. CO-OPERATIVE ACCOUNTING. III. MARKETING CO-OPERATIVE SOCIETIES. 1972.

Each of the individual pamphlets ... is complete in itself, dealing with a particular type of co-operative business, but, together, they constitute a comprehensive manual on accounting for primary co-operatives."

AGRICULTURE

- F9350 "New Strain of Sorghum Developed." FRONT LINES, 13 (November 21, 1974), 1- Account of research at Purdue University that produced a high lysine variety of sorghum that promises to help improve the critical world food situation.

AGRICULTURAL DEVELOPMENT

- D4870 Fung, K.K. "Output vs. 'Surplus' Maximization: The Conflicts Between the Socialized and the Private Sector in Chinese Collectivized Agriculture." THE DEVELOPING ECONOMIES, XII (March, 1974), 41-55.

... "Attempts to analyze the nature of the conflicts between the developmental and extractive objectives of collectivization by examining the compatibility between the production relation as instituted in a Chinese collective and the productive forces on which production is based. If the production relation and the productive forces are compatible, then the developmental and extractive objectives in collectivization need not be conflicting. But if they are not compatible, then collectivization is not an optimum development strategy quite apart from the complicating introduction of the extractive objective."

- D4870 Inukai, Ichirō. "African Socialism and Agricultural Development Strategy. A Comparative Study of Kenya and Tanzania." THE DEVELOPING ECONOMIES, XII (March, 1974), 3-22.

Discusses specific agricultural development government policies in the two countries.

AGRICULTURAL EQUIPMENT

- 51250 Intermediate Technology Development Group, Ltd. OX-DRAWN TIE-RIDGER/WEEDEE IMPLEMENT. Agricultural Equipment and Tools for Farmers Designed for Local Construction, No. 11. n.d.
- 51251 Intermediate Technology Development Group, Ltd. "I.D.C." WEEDING ATTACHMENT FOR "EMCOT" PLOUGH. Agricultural Equipment and Tools for Farmers Designed for Local Construction No. 12. n.d.
- 51252 Intermediate Technology Development Group, Ltd. ADJUSTABLE-WIDTH 'V-DRAG' DITCHER/BUND FORMER. Agricultural Equipment and Tools for Farmers Designed for Local Construction, No. 13. n.d.
- 51253 Intermediate Technology Development Group, Ltd. SLED-TYPE CORRUGATOR/IRRIGATION-FURROW FORMER. Agricultural Equipment and Tools for farmers Designed for Local Construction, No. 14. n.d.
- 51254 Intermediate Technology Development Group, Ltd. SINGLE-ROW AND THREE-ROW RICE SEEDERS (ZAMBIA). Agricultural and Tools for Farmers Designed for Local Construction, No. 15. n.d.
- 51255 Intermediate Technology Development Group, Ltd. ROTARY WEEDEE FOR ROW-PLANTED RICE. Agricultural Equipment and Tools for Farmers Designed for Local Construction., No. 16. n.d.
- 51256 Intermediate Technology Development Group, Ltd. MULTI-ACTION PADDY-FIELD PUDDLING TOOL (JAPAN). Agricultural Equipment and Tools for Farmers Designed for Local Construction, No. 17. n.d.
- 51257 Intermediate Technology Development Group, Ltd. OIL DRUM FORGE DESIGNED FOR LOCAL CONSTRUCTION. 1973.
- Each pamphlet includes detailed diagrams, list of component parts, and brief narrative description.
- 51271 International Rice Research Institute. ECONOMIC ASPECTS OF HAND TRACTOR OWNERSHIP AND OPERATION, by Bert Orcino. Prepared for U.S. Agency for International Development. 1972.

BALANCE OF PAYMENTS

- J8635 Mason, R. Hal, and Masson, Francis G. "Balance of Payments, Costs and Conditions of Technology Transfers to Latin America." JOURNAL OF INTERNATIONAL BUSINESS STUDIES, V (Spring, 1974), 73-89.

"Identifiable balance of payments costs are reviewed. In addition, two interview surveys of private firms were conducted to examine common practices with respect to terms of transfers, including market restrictions, tying of purchases, and pricing."

DEVELOPMENT ASSISTANCE

- W2530 "AID - the New Challenge. A Special Report of the Agency for International Development." WAR ON HUNGER, VIII (December, 1974), 4-11.

Traces the development of U.S. foreign economic aid and opinions concerning its situation today. Charts and tables included.

DEVELOPMENT BANKS

- B8271 Aquino de Souza, Joao Batista. "The Role of Investment and Development Banks in the Capital Market." BRAZILIAN BUSINESS, LIV (September, 1974), 38-42.

"In this article we try to evaluate what the roles of investment and development banks have been in the Brazilian capital market in view of available historical data."

ECONOMIC CONDITIONS

- S9630 "Second Report to Club of Rome Warns Mankind Not to Ignore Dangers Lying Ahead - Inaction Assures Disaster." SURVEY OF INTERNATIONAL DEVELOPMENT, XI (November/December, 1974), 1-6.

Detailed discussion of the Club of Rome's second report, MANKIND AT THE TURNING POINT. The Club's first report was titled LIMITS TO GROWTH.

ECONOMIC DEVELOPMENT

- 40057 Center for International Economics and Economic Development. ECONOMIC INTERDEPENDENCE IN SOUTHEAST ASIA, edited by Theodore Morgan and Nyle Spoelstra. 1969.

Proceedings of a conference held at Bangkok, 1967 and sponsored by the University of Wisconsin Research Project on Economic Interdependence in Southeast Asia with financial support from U.S. Agency for International Development. The materials included are shortened and revised versions of the conference papers.

- D4870 Nakagane, Katsuji. "Notes on the Chinese Model of Economic Development - Its Impact on and Influence from Foreign Economic Systems." THE DEVELOPING ECONOMIES, XII (March, 1974), 23-40.

The article aims " ... to explore the characteristics of the Chinese economy (People's Republic of China) and its development qualitatively, defining the terms to be used in ... discussion ... Many developing countries have been paying attention to the development pattern of the Chinese economy in expectation

that it may provide implications for economic planning. Whether the Chinese economy is a market, an example of socialist economic system, or a development model, it cannot be ignored ... It is also undeniable that it is confusing in its peculiarity and ambiguity due to the lack of data."

- D4870 Sarkar, N.K. "A Simulation Model for Performance Evaluation of Developing Economies." THE DEVELOPING ECONOMIES, XII (March, 1974), 56-73.

This paper which includes an evaluation model for Thailand, was the product of a joint research project by the U.N. Asian Institute and the Thailand Government.

ECONOMIC TRENDS

- 51266 U.S. Agency for International Development. AFRICA: ECONOMIC GROWTH TRENDS. 1974.

- 51268 U.S. Agency for International Development. EAST ASIA: ECONOMIC GROWTH TRENDS. 1974.

- 51269 U.S. Agency for International Development. LATIN AMERICA: ECONOMIC GROWTH TRENDS. 1974.

- 51267 U.S. Agency for International Development. NEAR EAST AND SOUTH ASIA: ECONOMIC GROWTH TRENDS. 1974.

Annual statistical pamphlets providing data on basic country data, regional comparisons, population, national product, production, consumer price indexes, trade and investment, gross gold and foreign exchange holdings, student enrollment.

EDUCATION

- 51236 U.S. Agency for International Development. TEACHER EDUCATION: A SELECTED LIST OF REFERENCES FOR AID TECHNICIANS. AID Bibliography Series: Education and Human Resources, No. 3. 1972.

- D4870 Bautista, Romeo M. "The Influence of Education on Manufacturing Productivity: the Philippines." THE DEVELOPING ECONOMIES, XII (March, 1974), 74-82.

The author concludes that the amount of formal schooling and industrial productivity have no significant relationship in the Philippines. This indicates that the educational systems in developing countries must concentrate on the quality of education and its relation to the needs of local industries.

ENGINEERING

- A6430 Yamaki, N. "Industrial Engineering Problems: A Top Management View." APO NEWS, IV (November, 1974), 4-6.

An article excerpt from the author's speech to the Industrial & Systems Engineering Training Course August 9, 1974. The author is Senior Managing Director, Mitsubishi Electric Co., Ltd., Tokyo.

ENGINEERING EDUCATION

- 51277 Cornell University. Program on Policies for Science and Technology in Developing Nations. POLICIES OF INTERNATIONAL AGENCIES TO COORDINATE ACTIVITIES IN DEVELOPING COUNTRIES: COLOMBIA, A CASE STUDY, by Franklin J. Ahimz and Daniel W. Kops, Jr. 1974.

"... a preliminary study into the degree of coordination that exists among the major international agencies providing assistance to developing countries. It is limited to aid to science and engineering education and manpower training, using the Republic of Colombia as a case study ... Examining both stated policies and actual operations, the study records areas where cooperation exists and cases where better coordination is necessary."

FAMILY PLANNING

- S9335 Chen, Lincoln C. et al. "Maternal Mortality in Rural Bangladesh." STUDIES IN FAMILY PLANNING, V (November, 1974), 334-341.

Two studies of a population of 231,000 between 1967-1970 indicates a direct relationship a maternal mortality rate of 7.7 and 5.7 deaths per 1000 live births and obstetrical factors. A family planning program is suggested to sharply reduce this mortality rate.

FEASIBILITY STUDIES

- 51276 U.S. Agency for International Development. Office of Engineering. FEASIBILITY STUDIES, ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS, CAPITAL PROJECTS. 1964

"The purpose of this manual is to provide guidance as to the kinds and extent of information which should accompany applications for loans and grants as evidence of the soundness of proposed capital projects."

FINANCIAL STRUCTURE

- 40061 Basch, Antonin and Kybal, Milic. CAPITAL MARKETS IN LATIN AMERICA: A GENERAL SURVEY AND SIX COUNTRY STUDIES. Praeger Special Studies in International Economics and Development. 1970.

"This book analyzes at a regional level the process of savings and investment in Latin America, noting that the six countries reviewed account for about 85 percent of the gross investment in the region. Subsequently, it examines various categories of financial institutions which operate in the capital market, stock exchanges and indicates some conditions that favor a more effective functioning of the capital markets in Latin America." The country studies include Argentina, Brazil, Colombia, Mexico, Peru and Venezuela.

- J8617 Helleiner, G.K. "The Less Developed Countries and the International Monetary System." THE JOURNAL OF DEVELOPMENT STUDIES, 10 (April-July, 1974), 347-373.

"The functioning of International Monetary System is analyzed from the perspective of the less developed countries."

- F4190 Lowe, John W. "Financial Markets in Developing Countries." FINANCE AND DEVELOPMENT, XI (December, 1974), 38-41.

FINANCING

- 02400 Pakenham, Kevin and Gore-Booth, Josslyn. "The Eurocurrency Markets as a Source of Finance for the Developing World." ODI REVIEW, NO. 2, (1974), 14-25.

Clarifies the concept of Eurocurrency markets and describes the Eurocurrency borrowing of developing countries, including a Table of Credits to LDC's. 1971-1974 (first quarter).

HOUSING

- 51262 Cornell University. Program on Policies for Science and Technology in Developing Nations. LOW-COST HOUSING FOR DEVELOPING COUNTRIES: AN ANNOTATED BIBLIOGRAPHY 1950-1972, by Floyd O. Slate. 1974.

Material limited to English language sources.

INFORMATION SYSTEMS

Cornell University. Program on Policies for Science and Technology in Developing Nations. SCIENCE AND TECHNOLOGY FOR INTERNATIONAL DEVELOPMENT: A SELECTED LIST OF INFORMATION SOURCES IN THE UNITED STATES. 1974.

Directory of information centers dealing with science and technology for developing countries. Provides address, personnel contact, description of collection strength, publications and information services.

- 51261 National Academy of Sciences. Board on Science and Technology for International Development and Republic of China, Academia Sinica. SCIENTIFIC AND TECHNICAL INFORMATION NEEDS AND RESOURCES IN THE REPUBLIC OF CHINA. Report of a Sino-U.S. Workshop held in Washington, D.C. 24-26 April 1973. 1974.

- U5650 Ogunsheye, F. Adetowun. "Library Education at Ibadan University, Nigeria." UNESCO BULLETIN FOR LIBRARIES, XXVIII (September-October, 1974), 259-268.

"A review of the changes and development that have taken place at the Institute of Librarianship at Ibadan University, and assessment of its achievements and the problems that have arisen in building up a library school in Africa."

INTERNATIONAL DEVELOPMENT

- J8617 Horvat, Branko. "The Relation Between Rate of Growth and Level of Development." THE JOURNAL OF DEVELOPMENT STUDIES, 10 (April-July, 1974), 382-394.

"The paper tests the hypothesis that countries pass through three successive phases of development: an initial phase of stationary or slow growth; a phase when the growth rate is increasing (accelerating growth) and finally, a phase of decreasing (decelerating growth).

- 51237 Howard University. School of Engineering. SEMINAR SERIES ON TECHNOLOGY AND DEVELOPMENT. REPORT OF AID GRANT. VOLUME I. Edited by Leatha S. Henson. 1974.

- 51238 Howard University. School of Engineering. SEMINAR SERIES ON TECHNOLOGY AND DEVELOPMENT. REPORT OF AID GRANT. VOLUME II. Edited by Leatha S. Henson. 1974.

"The purpose of the seminar series was to examine the process of development, the role of technical assistance and the application of technology to the needs

of developing countries, ... an attempt was made not only to examine the beneficial aspects of technology, but also to assess some of the possible detrimental effects of technology on developing nations ..."

- 02400 Hunter, Guy. "Indigenous Development and the Developing World." ODI REVIEW, No. 2, (1974), 61-74.

The author reemphasizes the often-made observation that donor countries must not impose their own social characteristics on developing nations, but allow them to follow processes to achieve their own distinct style.

LABOR AND LABOR CONDITIONS

- 51270 Erasmus University Rotterdam. Centre for Development Planning. THE NATURE AND MAGNITUDE OF UNDERUTILIZATION OF LABOR IN NON COMMUNIST LESS DEVELOPED COUNTRIES, by H.H. de Hann. 1974.

"The main purpose of this paper is to indicate the nature of underutilization of labour in less developed countries and to summarize the available empirical evidence of its magnitude. In addition, prospects for future employment growth are examined."

- 16175 Pain, Abraham. "Workers Attitudes Towards Vocational Training - A Case Study in Argentina." INTERNATIONAL LABOUR REVIEW, CX (November, 1974), 455-466.

"Small and medium sized firms in Argentina are in a difficult position with regard to vocational training: they lack the financial and organizational resources to set up their own training schemes, yet together they employ a large proportion of the national labour force. An inquiry conducted by the author into the workers' attitudes ... revealed that formal, systematic training was not highly valued as a means of learning a job, being considered too theoretical ... The author seeks to explain these reservations and suggests various ways of overcoming them."

PERSONALITIES

- K8433 KOREA NEWS REVIEW, III (November 23, 1974).

A substantial portion of this issue is devoted to President Ford's recent visit to Korea.

POPULATION

- 40056 Farmer, Richard N., Long, John D., and Stolnitz, George J., editors. WORLD POPULATION - THE VIEW AHEAD. Proceedings of the Conference on World Population Problems held at Indiana University on May 3-6, 1967. International Development Research Center Series, No. 1. 1968.

RICE PRODUCTION

- 51272 International Rice Research Institute. DRYING AND PROCESSING RESEARCH AT IRRI, by A.S. Manalo, et al. Prepared for U.S. Agency for International Development. 1972.

RURAL DEVELOPMENT

- 51275 American Council on Education. Overseas Liaison Committee. EXPERIENCES IN RURAL DEVELOPMENT: A SELECTED, ANNOTATED BIBLIOGRAPHY OF PLANNING, IMPLEMENTING, AND EVALUATING RURAL DEVELOPMENT IN AFRICA, by Tekola Dejene and Scott E. Smith. OLC Paper, No. 1. 1973.
Annotated bibliography of 250 books, reports, and journal articles.
- 51265 Anthonio, Q.B.O. and Ijere, M.O. UBOMA DEVELOPMENT PROJECT 1964-1972: AN APPRAISAL OF A TECHNICAL ASSISTANCE PROGRAMME FOR RURAL DEVELOPMENT IN NIGERIA. 1973.
Description, with statistical tables and photographs of an agricultural development program sponsored by Shell Nigeria Limited in cooperation with the Ministry of Agriculture of the East Central State of Nigeria.
- 51274 Asia Society. Southeast Asia Development Advisory Group. RURAL DEVELOPMENT AND DEVELOPMENT ADMINISTRATION IN MALAYSIA, by Stephen Chee. SEADAG Papers on Problems of Development in Southeast Asia. 1974.
A slightly revised version of the author's paper presented to the SEADAG Development Administration Panel on "Rural Local Government and Development Administration in Southeast Asia." April, 1974.
- 51273 Asia Society. Southeast Asia Development Advisory Group. TOWARDS A COMMODITY ORIENTED DEVELOPMENT MODEL, by Walter C. Labys and Thomas F. Weaver. SEADAG Papers on Problems of Development in Southeast Asia.
This is an edited version of a paper presented by the authors to the SEADAG Rural Development Panel Seminar, on 'Directions in Rural Development Planning', July, 1973.
- 51279 Patten, Richard; Dapice, Belinda; Falcon, Walter. AN EXPERIMENT IN RURAL-EMPLOYMENT CREATION: INDONESIA'S KABUPATEN DEVELOPMENT PROGRAM. n.d.
"This report traces the origins of the program, illustrates how policy makers conceived of it in terms of overall economic strategy, describes in some detail its organizational and control features, and draws some preliminary conclusions regarding the program's effects on employment and on decentralized planning."
- F4910 Waterson, Albert. "A Viable Model for Rural Development." FINANCE AND DEVELOPMENT, XI (December, 1974), 22-25.
Description of an agricultural development model and brief accounts of the China, Tanzania and Israel experiences.

SMALL SCALE INDUSTRY

- B8271 "Small Enterprises Get Assistance in Northeast." BRAZILIAN BUSINESS, LIV (November, 1974), 53-56.
Describes the work of UNO - Northeastern Union of Assistance for Small Organizations - providing credit and technical assistance to small businesses in Brazil.
- 51263 U.S. Agency for International Development. SMALL AND MEDIUM INDUSTRY DEVELOPMENT. Prepared by Office of Science and Technology, Bureau for Technical Assistance in

cooperation with AID Reference Center. AID Bibliography Series: Science and Technology, No. 1. 1974.

Annotated bibliography with emphasis on materials published before 1971.

- 16175 Watanabe, Susumu. "Reflections on Current Policies for Promoting Small Enterprises and Subcontracting." INTERNATIONAL LABOUR REVIEW, CX (November, 1974), 405-422.

"Policy makers in India, inspired by Gandhian ideology and the example of Japan, have consistently emphasized the role of small enterprises and subcontracting as means of increasing employment and economising capital. In practice, however, these aims have not always been achieved. This leads the author to examine briefly the differences in the capital/labour, capital/output, and output/labour ratios noted in Japanese enterprises of varying sizes, and to discuss some hitherto neglected economic and institutional aspects of the Indian approach to the promotion of small enterprises and industrial subcontracting which may have made the process unnecessarily expensive. He concludes with some practical proposals.

SOCIAL CONDITIONS

- 40060 Taylor, Charles Lewis and Hudson, Michael C. WORLD HANDBOOK OF POLITICAL AND SOCIAL INDICATORS. Second edition. 1972.

"Attempts to compare nations on a great variety of politically relevant indices ... to present some of the data necessary for the further development of a science of comparative and international politics and to illustrate some of the means of analyzing the data." Statistical tables include data on political structure and performance, political protest and executive change, social patterns, natural resources and development, external relations.

TECHNICAL ASSISTANCE

- 51264 U.S. Agency for International Development. ADVISORS AND COUNTERPARTS: RELATIONSHIPS BETWEEN FOREIGN TECHNICAL ASSISTANCE EXPERTS AND HOST COUNTRY COLLEAGUES. Prepared by Technical Assistance Methodology Division, Bureau for Technical Assistance in cooperation with the AID Reference Center. AID Bibliography Series: Technical Assistance Methodology, No. 1. 1972.

TECHNOLOGY SELECTION

- 51278 U.S. Agency for International Development. Bureau for Program and Policy Coordination. MULTINATIONAL CORPORATIONS IN LESS DEVELOPED COUNTRIES: THE CHOICE OF TECHNOLOGY. AID Discussion Paper, No. 29. 1974.

The study "estimates and compares production functions of 1484 foreign affiliates in DCs and LDCs of more than 200 U.S.-based multinational corporations in eleven manufacturing industries."

TEXTILE INDUSTRY

- 02400 Tulloch, Peter. "Developing Countries and Trade in Textiles." ODI REVIEW, No. 2 (1974), 37-49.

Discusses problems involved in textile industrialization in LDC's. Includes statistical tables, comments on trade restrictions and future prospects of the cotton-synthetic situation.

TOURISM

- 51239 Council of Planning Librarians. THE TOURIST INDUSTRY IN LATIN AMERICA: A BIBLIOGRAPHY FOR PLANNING AND RESEARCH, by Robert C. Mings. 1974.
Foreign language publications included.

TRADE

- 09600 U.S. Department of Commerce. OVERSEAS BUSINESS REPORTS: MARKET FACTORS IN SOUTH AFRICA. November, 1974.
- 09600 U.S. Department of Commerce. OVERSEAS BUSINESS REPORTS: MARKETING IN KENYA. October, 1974.
- 09600 U.S. Department of Commerce. OVERSEAS BUSINESS REPORTS: MARKETING IN THE PHILIPPINES. October, 1974.

A series of reports that concentrate on the foreign trade outlook of a particular area. Statistical and descriptive information (including general area data) provided.

TRANSPORTATION

- F9350 Rosenthal, Jerry E. "Transportation - The Bottleneck of Development." FRONTLINES 13 (November 21, 1974), 4-5.
Account of AID's assistance to African developing countries in the area of transportation. Photographs.

TRAVEL

- A2580 Synge, Richard. "Africa on the Cheap." AFRICA REPORT XIX (November-December), 14-17.
A brief travel article on ways and means of seeing Africa inexpensively.

URBAN PLANNING

- J8630 McGreevey, William Paul. "Urban Growth in Colombia." JOURNAL OF INTERAMERICAN STUDIES AND WORLD AFFAIRS, XVI (November, 1974), 387-408.
Discusses Colombian regional and urban policies and the affect that urbanization and migration patterns should have on their planning.

WATER RESOURCES

- 51280 National Academy of Sciences. MORE WATER FOR ARID LANDS: PROMISING TECHNOLOGIES AND RESEARCH OPPORTUNITIES. 1974.
"Each technology is presented in a separate chapter, and the material is arranged under these topics: Methods, Advantages, Limitations, Stage of Development,

Needed Research and Development, Selected Readings, and Contacts (a list of individuals or organizations the panelists know to be involved in relevant research)."

- 51235 U.S. Agency for International Development. COMMUNITY WATER SUPPLY: A SELECTED LIST OF REFERENCES FOR AID TECHNICIANS. AID Bibliography Series: Health, No. 1. 1969.

Kay Ellen Auciello
International Development Data Center