

**SMALL-SCALE INDUSTRY  
GRANT**



**FUNDAÇÃO EDUCACIONAL DO SUL  
DE SANTA CATARINA ACTIVITIES**

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

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

FINAL REPORT

FUNDAÇÃO EDUCACIONAL DO SUL DE  
SANTA CATARINA (FESSC)  
SMALL-SCALE INDUSTRY GRANT

by

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and

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Contract No. AID/ta-c-1062

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

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## INTRODUCTION

On January 23, 1974, the Agency for International Development (AID) funded Contract No. AID/ta-c-1062 through which the Georgia Institute of Technology (GIT) was to make \$45,000 grants for small-scale industry programs to two institutions of higher learning to be selected in different geographic regions of the world. This is the final (end-of-the-year) report for the work performed jointly by the staff of the Fundação Educacional do Sul de Santa Catarina (FESSC) in Brazil and the Georgia Institute of Technology.

Following contract guidelines, the administration of the Georgia Institute of Technology used the following criteria in selecting grantee institutions:

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

After an extensive initial screening, the Fundação Educacional do Sul de Santa Catarina submitted a proposal entitled "Program of Development for Small and Medium Industries." This proposal was later funded under the existing contract provided by AID to the Georgia Institute of Technology. The basic objective of the project is to assist in the generation of employment through the development of small-scale industries outside metropolitan centers. Some of the immediate results of this project are the following:

1. Establishment of the Basic Data Center (CDB) within the Department of Research and Development (DPD) at FESSC.
2. Establishment of the Center for Management and Technical Assistance (CETEG).
3. Establishment of the Community Development Center (CDC).

4. Training at IDD of three senior staff members.
5. Provision of technical assistance services to 45 local small-scale industries.
6. Preparation and publication of one feasibility study.
7. Preparation and publication of an industrial expansion project.
8. Preparation and publication of two new manufacturing opportunity studies.
9. Establishment of the Adaptive Technology Center (CATT).
10. Preparation of an audiovisual documentation of the first-year program by the Technology and Development Institute, East-West Center, Hawaii.
11. Training of over 2,500 persons through 112 training programs.
12. Participation in and/or contribution to the following development meetings or conferences:
  - a. Third National Seminar of the Small and Medium Industry.
  - b. Regional Meeting on Human Resources.
  - c. Meeting of the Brazilian Institute of Technical and Management Assistance.
  - d. Meeting of the Brazilian Agro-Cattle Research Company.

Additional sections of this final report describe in detail the background, objectives, activities scheduled in the program of work, results achieved, and the conclusions reached by the project staff.

## PROGRAM PLANS FOR YEAR I

### Background

The Fundação Educacional do Sul de Santa Catarina (FESSC) is an autonomous organization established under the civil code and legislation, under special decrees and Laws 200 and 900.

FESSC was established by Municipal Law No. 443/67 of October 18, 1967, and its bylaws define the following objectives:

1. Create, integrate, organize, and maintain schools of higher and medium level of professional quality, as established by the needs of the labor market of the region, state, and country.

2. Carry out course program, training, and specialization for graduates and special courses for post-graduates.

3. Promote, study, and research in relation to the economic development and social development of the region and state by themselves, or with the assistance, or in cooperation with private and public entities.

4. Promote conferences, debates, and seminars as a dissemination of studies related with economic problems in general or specifically of the region of South Santa Catarina.

5. Adopt, as needed, the necessary organization to implement the future University of South Santa Catarina.

The Council of Curators is made up of representatives of the entities that support and created the organization. Its Executive Secretary is the representative of FESSC, at present the President of the Executive Directory of the Foundation, Dr. Osvaldo dela Giustina.

The Executive Directory of FESSC is composed of its President (the Executive Secretary of the Curator Council), the Director of the Department of Higher Education, the Department of Secondary Education, and the Department of Research and Development. There is also an Educational and Technical Advisory Council to the Directory.

The support organization to the administration includes a Secretary General, Associate Director, Administrative Assistant, and assistance in teaching and planning.

The Higher Education Department coordinates the schools and institutes and course work at that level carried out by FESSC. In December 1972, the Higher Education Department had a faculty of economic sciences, course work in economics, and was establishing courses in accounting sciences and administration.

The School of Advanced Sciences and Teaching offers courses in teaching (teachers, administration of school, educational orientation, and teaching orientation), languages (Portuguese, English, and French), and social studies (geography and history), and is now establishing a course in philosophy, civics, and ethics and course work for professors in the areas of professional techniques.

The Department of Secondary Education is made up of the Integrated School Father Dehon and a small experimental school.

The Research and Development Department has a center or institute to provide technical assistance, research, planning, and information oriented to local development and regional development of private enterprises, communities, municipalities, and other public sectors, as well as the private and civic community.

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

Finally, FESSC presented a proposal to the Georgia Institute of Technology entitled "Program of Development for Small and Medium Industries," and this became a grant of \$45,000 funded under an existing contract provided to GIT by AIB for this purpose.

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

The Georgia Institute of Technology and the Technology and Development Institute, East-West Center, subsequently contracted with the Fundação Educacional do Sul de Santa Catarina to provide training, consultation, and an audio-visual documentation of the project.

At the time the project became effective on January 10, 1974, the FESSC organizational structure was as is shown in Figure 1.

The President of the Executive Directory, Dr. Osvaldo dela Giustina, designated Econ. Jose Muller, Head of the Department of Research and Development, to serve as Counterpart Project Director. The Chief of the Industrial Development Division appointed Mr. Nelson C. Wall to serve as Project Director for Georgia Tech's portion of the program.

### Objective

In general, it is the objective of this project to develop a small-scale industries program at the Fundação Educacional do Sul de Santa Catarina. Through this program, FESSC would (1) assist in generating employment in Santa Catarina, particularly outside the main metropolitan centers, (2) provide technical assistance to small and medium industries in the selected areas, and (3) strengthen the relevancy of the educational program.

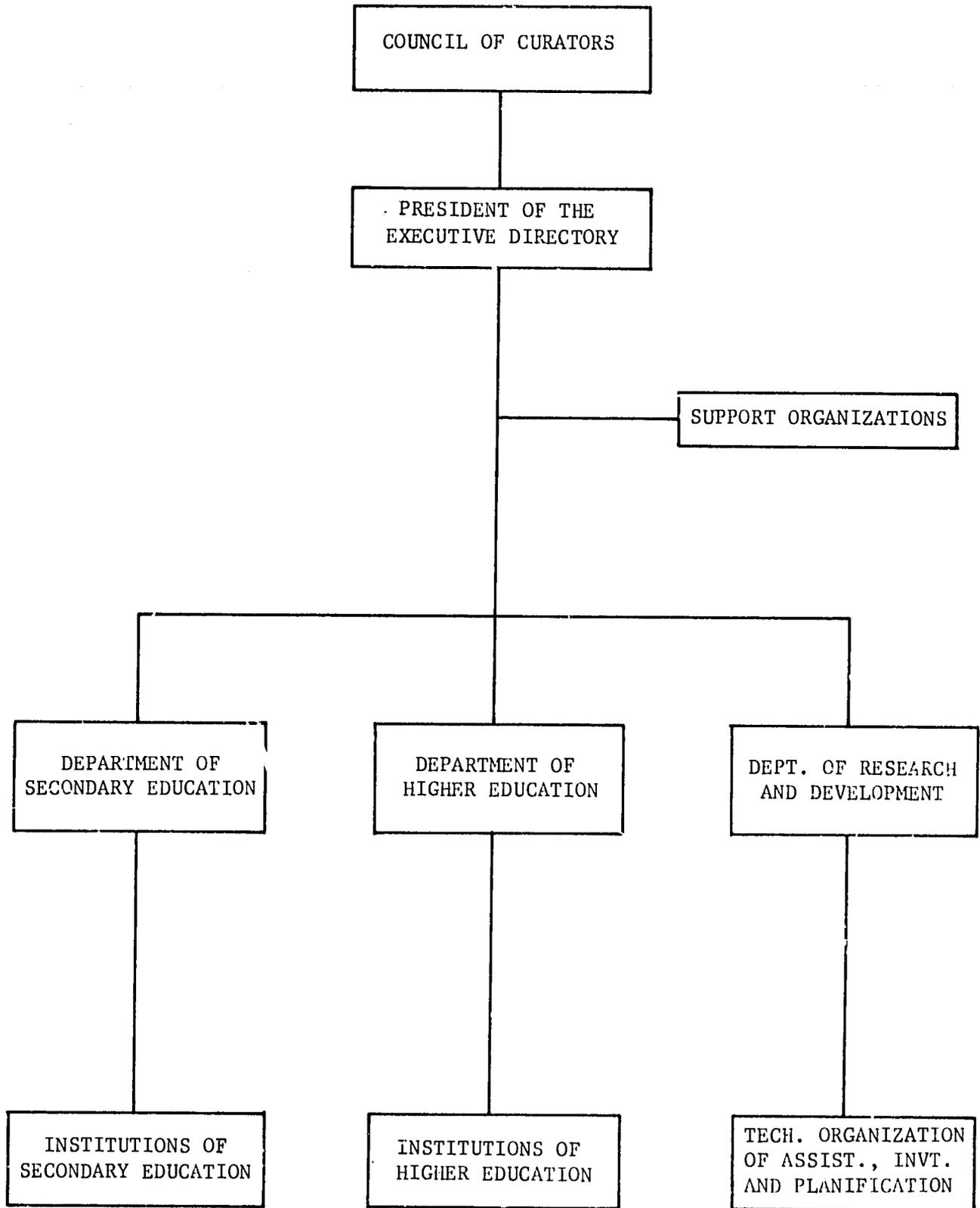
The project administration, under the contract with the grantee, then established two main areas of activity for the Georgia Institute of Technology staff which would assist in attaining the established objectives: (1) training of selected FESSC staff members both in Brazil and the USA and (2) providing on-site consultation by staff members of the Industrial Development Division of the Engineering Experiment Station at the Georgia Institute of Technology. It was also established that the project staff would assist FESSC personnel in providing managerial, engineering, scientific, and technical assistance to selected small and medium industries in the selected geographic areas of Santa Catarina.

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

At the start of the "Small-Scale Industry Grant" on January 23, 1974, the following total goals had been established by the Georgia Tech grant for the first year of activity:

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

Figure 1  
ORGANIZATIONAL STRUCTURE OF THE  
FUNDAÇÃO EDUCACIONAL DO SUL DE SANTA CATARINA  
(January 1974)



2. Carry out preliminary visits to the selected institutions to develop and establish patterns of collaboration.
3. After final selection, assist the grantee in preparing final plan for the utilization of the grant funds in a manner best suited to achieve the stated objectives.
4. Award the grant once this was approved by AID.
5. Provide consultation to the grantee during the planned activity period.
6. Monitor and evaluate project at least twice during the following 12-month period.
7. Assemble base-line data study at the start of the project.

All of the established goals were met during the first year of the project plus several additional accomplishments which were listed in the introduction and will be amplified in the balance of this final report.

#### Program of Work

A program of work had been presented in the original FESSC proposal and, on the basis of that document, the project administration established the following activities for the first 12-month period, all of which have been implemented:

1. Organization. Taking the existing organization at FESSC (Figure 1), specific responsibilities were established for the units so that they would assume the task of implementing the different portions of the program. New administrative units were also required and these were created. All programs were to be oriented in such a manner as to serve the small and medium industries in the selected areas.
2. Staff and Physical Plant. Based on the needs of the different program units, it was necessary to allocate appropriate office space and equipment to assure the logistical support necessary to the implementation of the program. The staff was then selected and the candidates were considered on the basis of interest, capability, and motivation to carry out the requested task.
3. Project Policy. The program required a multi input-output system with the proper flexibility to assure compliance with the basic theme -- stimulation of existing and new small-medium scale industries.

4. Program Areas. The program was designed to support the implementation of the following activities over a 12-month period:

a. Establishment of the Basic Data Center (CDB). An incipient center existed within the Department of Research and Development. It was the objective of the project to expand and develop this center to house pertinent information on social, economic, industrial, and technological origin and to classify these data so that it would serve as a source of information viable to the FESSC activities.

b. Establishment of the Center for Management and Technical Assistance (CETEG). The program proposed to formalize this operation and determine a rationale to serve for future expansion of this much needed service once it was established. Mr. Humberto Dalsasso was given the responsibility of setting up the center under the guidance of the Counterpart Project Director and the IDD on-site staff.

c. Establishment of the Adaptive Technology Center (CATT). This new unit would be working with CETEG in carrying out the tasks of providing technical assistance and adapting "foreign" technologies that were identified as appropriate to the local needs of small-scale industries. The responsibility for this task was originally assigned to a FESSC staff engineer, Mr. Jose C. Goetze, who has since been replaced by Mr. Adalguiso Domingues.

d. University Training and Education. It has been the desire of FESSC to improve their capability and evolve into an engineering school in the near future. During the Year I program, assistance would be provided to the FESSC staff by IDD staff consultant to develop a suggested curriculum as a starting point for an eventual "academic program" to be approved by the pertinent Brazilian authorities. One objective was the possible establishment of a Department of Industrial Engineering.

e. Industrial Training and Education. A specific short-term training program was to be developed by the IDD staff to cover the immediate needs of the counterpart staff. It was planned that during the first quarter of the year, three or four selected members of the FESSC staff would travel to Atlanta to IDD headquarters to receive special training.

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

Use of Grant Funds by FESSC

For the 1974-75 grant year, the grantee was funded in the amount of \$45,000. These funds were disbursed in the following manner:

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| Activities             | Disbursed to |                        |                       | Total        |
|------------------------|--------------|------------------------|-----------------------|--------------|
|                        | FESSC        | GIT                    | TDI/E-W               |              |
| Personal Services      | \$18,000     | \$12,500 <sup>1/</sup> | \$2,000 <sup>2/</sup> | \$32,500     |
| Travel                 |              |                        |                       |              |
| International          |              | 7,500                  |                       | 7,500        |
| Local                  | 4,000        |                        |                       | 4,000        |
| Materials and Supplies | <u>500</u>   | <u>500</u>             | <u>          </u>     | <u>1,000</u> |
| TOTAL                  | \$22,500     | \$20,500               | \$2,000               | \$45,000     |

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<sup>1/</sup>The GIT personal services include the authorized overhead and retirement charges.

<sup>2/</sup>The contract with the East-West Center was for a total of \$2,000 for the preparation of audiovisual material.

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## FESSC ACTIVITIES DURING PROGRAM YEAR I

The FESSC staff showed great dedication during the first program year as they carried out the bulk of the tasks programmed for this 12-month period.

### Establishment and Operation of the Basic Data Center

Three persons of the FESSC staff are at present operating this center -- two are senior members of the staff and one is a junior member. Mr. Marcos T. Hemkemeir, head of the center, has an academic background in economics and statistics. The center suffered a serious setback in March, when part of the collection was lost as the result of a flood. The staff has since reconstructed the center and it is now in full operation. During the year, the following activities were also carried out:

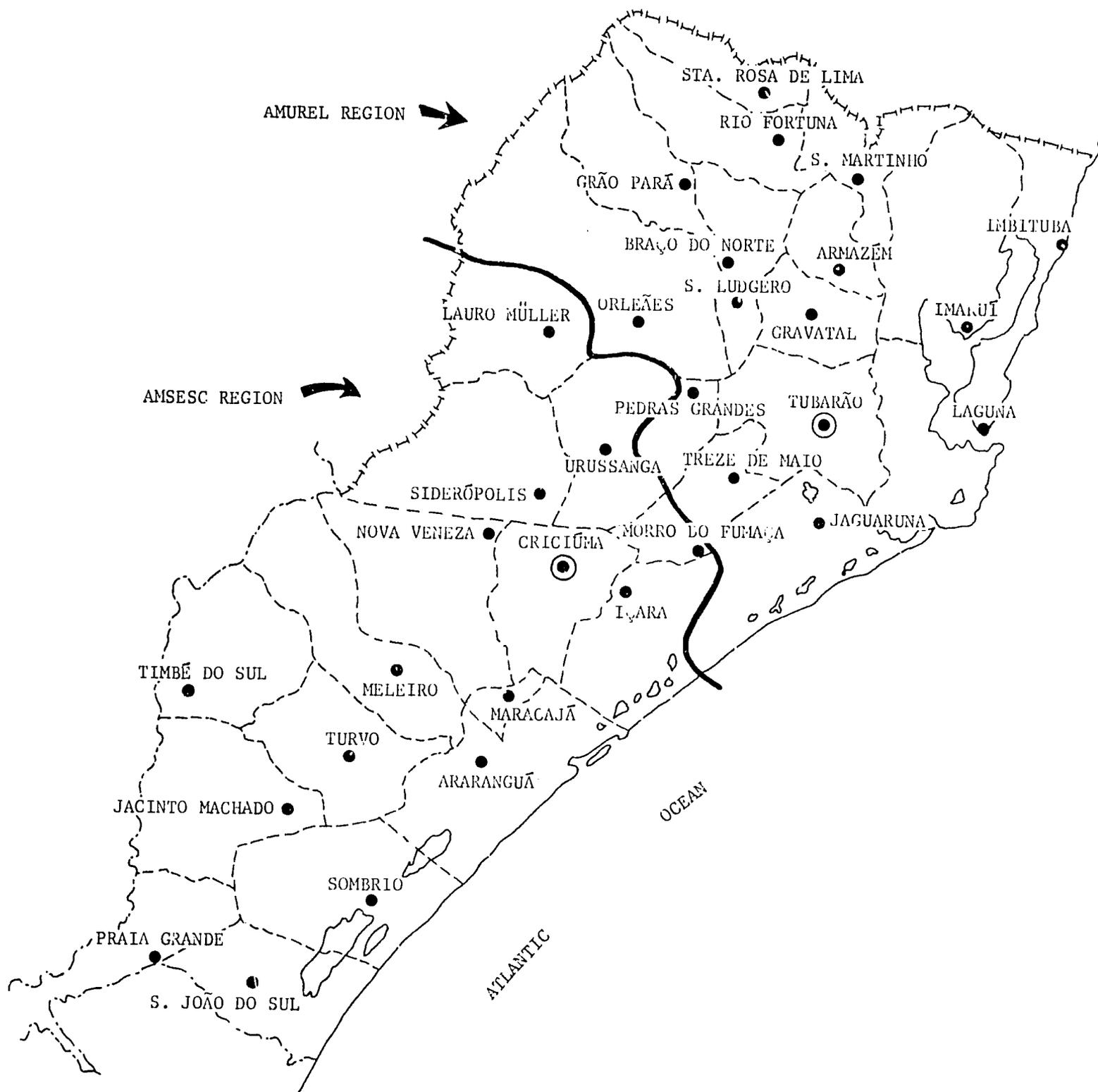
1. Registration of existing periodicals.
2. Preliminary listing of existing bibliographies.
3. Initial cataloging of local industrial enterprises.
4. Initial classification of bibliographies.
5. Continued collection of relevant newspaper clippings.

The center is expected to continue growing, and plans for Year II call for the acquisition of data and equipment with FESSC external funds. It may be said that the center has systematically expanded during the first year of the program. The head of the center will complete his special training program in Atlanta by the end of the project year.

### Center for Management and Technical Assistance

The staff of CETEG, under the direction of Mr. Humberto Dalsasso, has moved quickly forward into the area of providing technical assistance to small and medium-scale industries. As indicated earlier in this report, the staff of CETEG was able to provide technical assistance to 45 industries during the year. A recapitulation of these cases is presented in this report as Appendix 1. It is important to recognize the fact that the staff of CETEG is responsible for a geographic area of 9.5 thousand square kilometers, encompassing 32 municipalities forming two micro-regions called AMUREL and AMSESC. Map 1 will assist the reader in identifying the political divisions of the project area.

Map 1  
 POLITICAL DIVISIONS OF  
 SOUTH SANTA CATARINA, BRAZIL



### Adaptive Technology Center

CATT, the newest of the administrative units established during Year I of the program, is initially being directed by a young engineer, Mr. Jose C. Goetze of the FESSC staff. This unit will in the future review existing "foreign" technology and attempt to adapt it for use by local small-scale industries. While it may take several years before this project is "on stream," FESSC is the only institution in South Brazil that is willing to attempt to do this.

### Community Development Center

CDC was established and funded by the FESSC administration in an attempt to develop the different communities in the target area. Although not an integral part of this project, this center, together with the Center for Bio-Medicine (CMBS), was developed with the objective of better serving the population of South Santa Catarina. Both of these units played a very important role during the emergency period following the March 1974 flood.

### University Training and Education

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

### Industrial Training and Education

Early in the program year, it was planned that members of the FESSC staff would go to IDD headquarters in Atlanta for special training. It was anticipated that the participants would be in Atlanta by fall 1974, but due to the March flood, the dates had to be changed. On January 6, 1975, three participants started a six-week training program at IDD which was presented in Portuguese to facilitate instruction. This program is briefly outline in Appendix 2 of this report.

As part of the industrial training and education activities, the staff at FESSC established the Center for Continuous Education (CEP) designed to provide special training to workers and the public in general. During the past year,

the CEP staff presented 112 training programs and had over 2,500 participants complete the training course as follows:

| <u>Program Title</u> | <u>No. of Programs</u> | <u>No. of Participants</u> |
|----------------------|------------------------|----------------------------|
| Medical Aid          | 2                      | 50                         |
| Rural Programs       | 91                     | 2,296                      |
| Civil Construction   | 18                     | 195                        |
| Others               | <u>1</u>               | <u>11</u>                  |
| TOTAL                | 112                    | 2,552                      |

#### Emergency Program

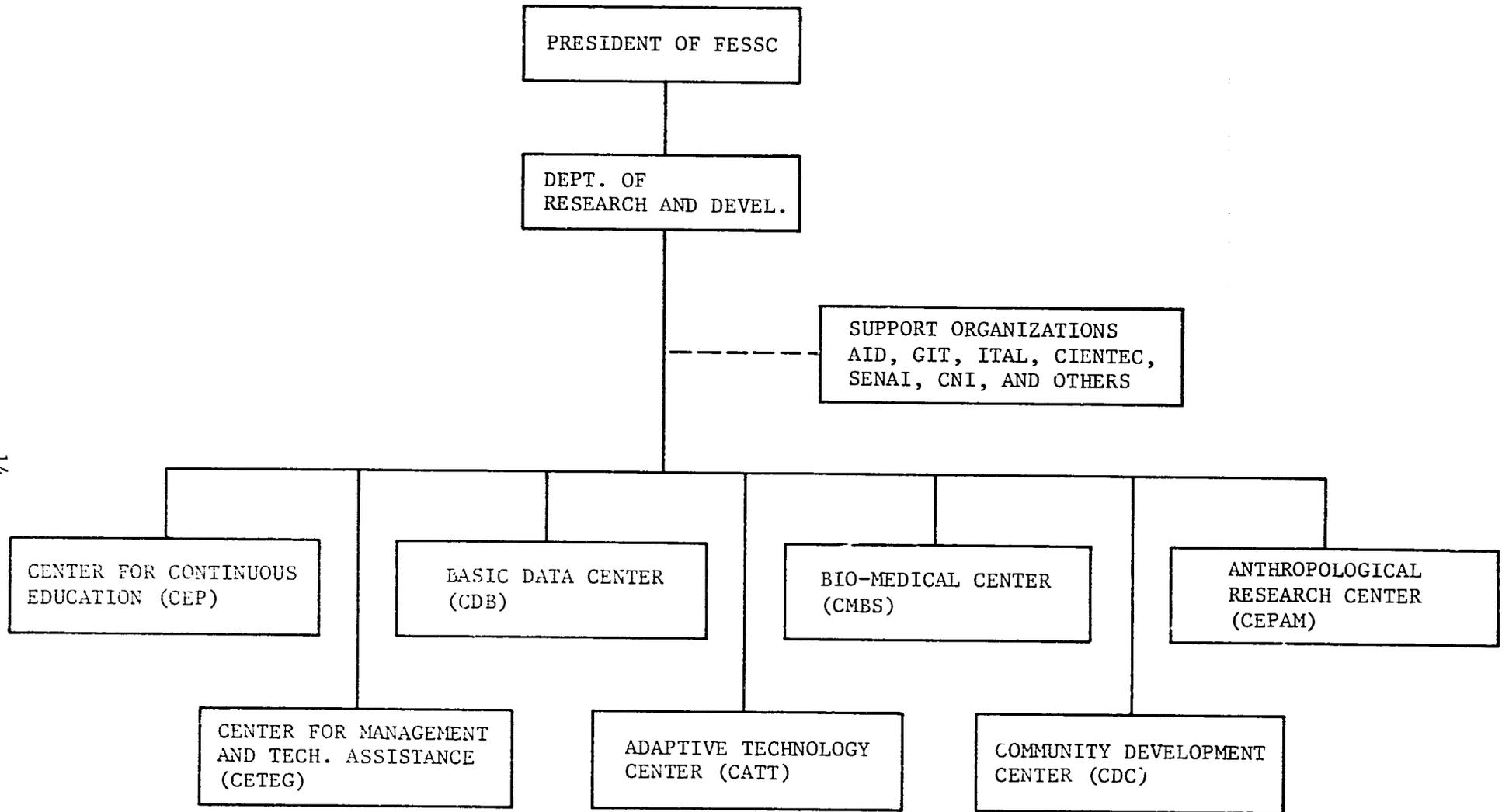
In a sincere desire to assist the public in general and the industrial community following the March 23-25 flood which covered 90% of the city of Tubarão, the FESSC staff established and funded an emergency program which used all available manpower at that time. In general, the following public services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

1. Team of three persons to work in the central area.
2. Team of three persons to locate and work in the AMSESC area.
3. Team of four persons to locate and work in the AMUREL area.
4. Preparation of reports suggesting priorities for the disaster areas.
5. Preparation of reports establishing the housing needs for the areas.
6. General community reconstruction projects.
7. Studies to determine the material losses caused by the flood.
8. Innoculation of vaccines to 65,000 persons.
9. Emergency saving of 18 lives and participation in 2,000 emergency cases.
10. Assistance in food and clothing distribution.
11. General counseling and assistance to local and federal authorities.
12. Reconstruction of FESSC after a material loss of well over one quarter million dollars.

#### Internal Organization

As the project evolved, so did the internal organization. By the end of the year, the counterpart project director had modified the organizational structure from the original shown in Figure 1 to a more viable organization which corresponds to the present needs of FESSC and the Department of Research and Development (see Figure 2).

Figure 2  
 ORGANIZATIONAL STRUCTURE OF THE  
 FUNDAÇÃO EDUCACIONAL DO SUL DE SANTA CATARINA  
 (January 1975)



GEORGIA INSTITUTE OF TECHNOLOGY ACTIVITIES  
DURING PROGRAM YEAR I

Activities of the Georgia Institute of Technology for the program year were initiated with the arrival in Tubarão of Mr. Ross W. Hammond, Chief of the Industrial Development Division, and Dr. David Fyffe of the Georgia Tech staff on March 4, 1974. They were later followed by Mr. George Morelos, Mr. Phil Potts, Mr. Richard Johnston, Mrs. Martha Ann Deadmore, Mr. Fred Burian, and again Mr. George Morelos late in December 1974. Each of the staff members had been assigned a specific task within the total goals of the project. In this section, a brief summary of the individual activities are presented in chronological order.

March 4 - March 8 (Ross W. Hammond)

The Project Director, Mr. Nelson C. Wall, had prepared the IDD work program for Year I and, at this time, Mr. Ross Hammond initiated the project in Tubarão and, in consultation with the grantee Project Director, completed the adjustments that were needed in the work program. The following major areas of work had been defined:

1. Basic Data Center
2. Center for Management and Technical Assistance
3. Adaptive Technology Center
4. University Training and Education
5. Industrial Training and Education

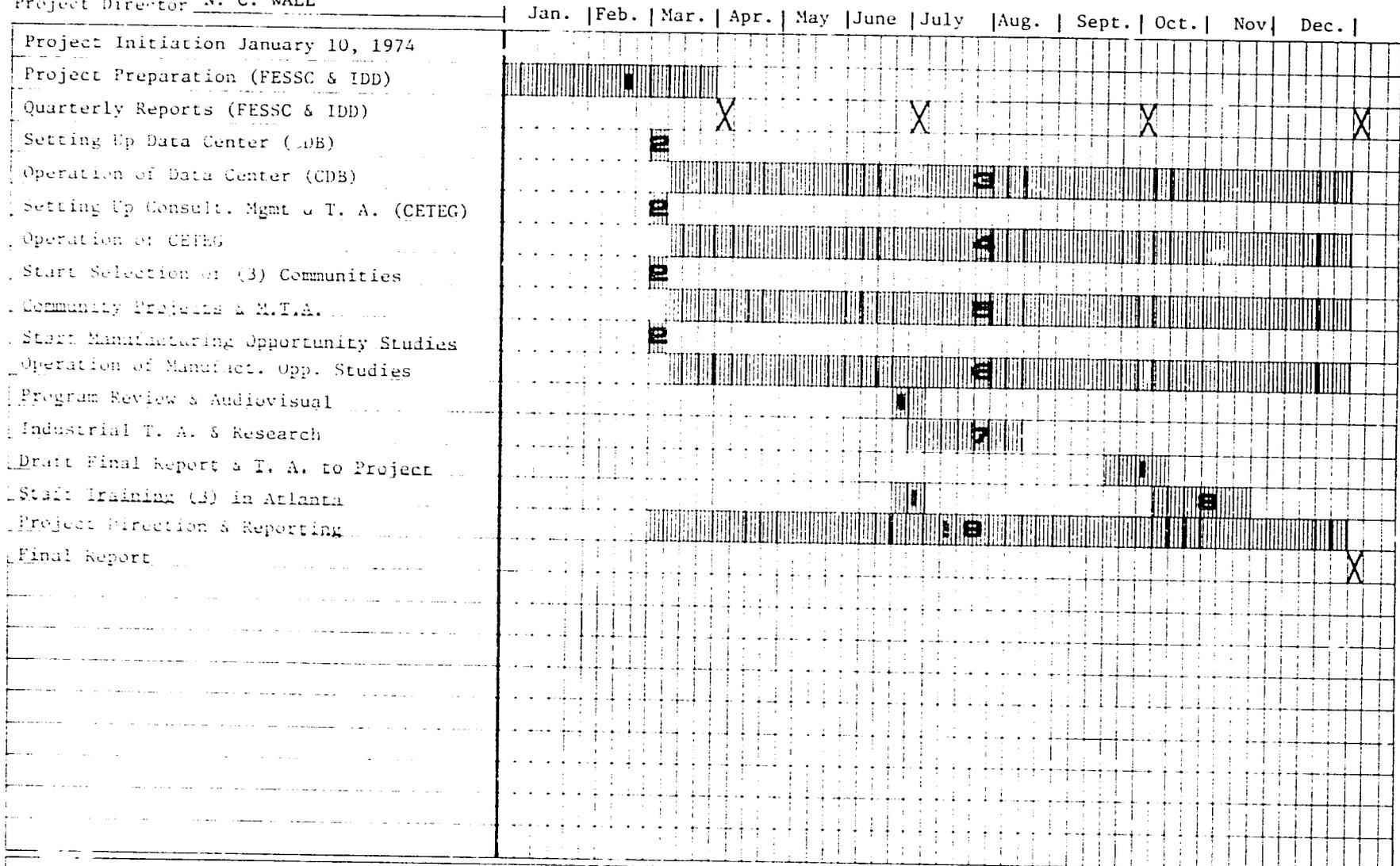
Depending on their expertise, different IDD staff members had been assigned to the project. The appropriate Project Plan had been developed and appears as Figure 3. While on site, Mr. Hammond also provided general consulting services to the FESSC staff, discussed the proposed engineering curriculum, and visited many of the small and medium industries that were expecting technical assistance.

March 4 - March 8 (David Fyffe)

This member of the IDD staff was being funded by a grant provided by the Agency for International Development to the Georgia Institute of Technology under the 211(d) grant program. His task was to present to the staff at FESSC the new program leading to the degree of Master of Science for students

Project No. B-427  
 Project Title SIG FESSC  
 Project Director N. C. WALL

Figure 3  
**PROJECT PLAN**



| LEGEND |                          |   |                         |   |                   |
|--------|--------------------------|---|-------------------------|---|-------------------|
| STAFF  |                          |   |                         |   |                   |
| 1      | N. C. Wall               | 4 | H. Dalsasso & Staff     | 7 | M Muñoz & Staff   |
| 2      | R. Hammond               | 5 | E. Ramm, Goetze & Staff | 8 | IDD Atlanta Staff |
| 3      | M. T. Hemkemeier & Staff | 6 | C. Goetze & Staff       | 9 | J. Muller         |

interested in small industry development. This program is being offered at Georgia Tech by the School of Industrial and Systems Engineering.

The administration at FESSC plans to prepare and present an "academic program" to the Minister of Education of Brazil and request authorization to establish a Department of Industrial Engineering at FESSC sometime in 1975. During his stay, Dr. David Fyffe was able to assist the faculty at FESSC, and they are at present completing the "academic program."

#### June 28 - July 6 (George Morelos)

As soon as possible after the disastrous flood of March 23-25, 1974, which affected 18 municipalities and over one-quarter million persons, a member of the IDD staff was sent to Tubarão to evaluate the situation and provide whatever assistance was possible to the counterpart institution and staff. Mr. Morelos was authorized by the Project Director to review, change, and adjust the Project Plan as needed to cope with the emergency and the needs of FESSC. During his on-site time in Tubarão, Mr. Morelos, together with the grantee Project Director, Mr. Jose Muller, set up an emergency program to provide assistance to small and medium scale industries in the areas that had been damaged by the flood. The objective was to help them get back into operation as quickly as possible. Other activities were also scheduled by the grantee staff and are presented under the FESSC staff section of this report.

#### June 28 - July 6 (Fred Burian)

Under a separate contract, FESSC had arranged for the filming of an audiovisual history of the activities of Year I of the project. Mr. Burian of the East-West Center staff traveled with Mr. Morelos to carry out his contractual assignment. The audiovisual documentary was filmed, and pictures were also taken of the damage caused by the March 1974 flood. Both the video tape and corresponding pictures were presented as part of the A-1600 report. These audiovisual materials are available to interested organizations.

#### August 16 - September 19 (George Morelos)

On this assignment, Mr. Morelos was to provide guidance and consulting services to the FESSC staff working in the Center for Management and Technical Assistance and the Adaptive Technology Center. During his 34-day stay in Tubarão, Mr. Morelos and the FESSC staff provided technical assistance to 23 industries in four municipalities. Other activities also were carried out,

such as assistance to the Department of Research and Development, meetings with local entrepreneurs to assist them in determining possible new industrial investments, initiation of prefeasibility studies, and other activities as determined by the overall program.

August 16 - September 19 (Phil Potts)

Together with Mr. Morelos, this member of the IDD staff shared part of the tasks mentioned in the preceding paragraph. Mr. Potts concentrated his work primarily in the area of provision of technical assistance to small and medium industries under the direction of the FESSC staff.

August 25 - August 31 (Richard Johnston)

The purpose of Mr. Johnston's trip was to assist the Basic Data Center in setting up procedures and determining the types of materials to be collected. His assignment was to provide guidance required by the FESSC staff in the daily operation of the CDB. In the performance of his assigned task, Mr. Johnston prepared a document entitled Provisional Procedures for the Operation of the Basic Data Center, which appears as Appendix 3 of this report.

August 25 - August 31 (Martha Ann Deadmore)

Funded under a separate grant on project (B-414) sponsored by the Agency for International Development, this member of the IDD staff visited Tubarão with Mr. Johnston. Mrs. Deadmore was involved in obtaining material for an IDD newsletter entitled "Small Industry Development Network." She interviewed the President of FESSC, Dr. Osvaldo dela Giustina, and the resulting article appeared in a later issue of the newsletter. She met staff personnel and worked with the associate editor located at FESSC.

December 7 - December 19 (George Morelos)

Mr. Morelos had the on-site assignment for the last period of activity. During this visit, he continued working with the staff of the Center for Management and Technical Assistance, the Adaptive Technology Center, and the Department of Research and Development. At the end of this period of assistance, the FESSC staff had been able to provide technical assistance service to 45 small and medium scale industries. Despite the disruption caused by the flood, the project staff met the established goals.

## RESULTS AND CONCLUSIONS

Many positive accomplishments have resulted from Year I of this program, some of which were listed briefly in the introduction of this report. The total funding available to FESSC from this project was very limited, yet the following results were achieved:

1. The FESSC/IDD staff, working with the Department of Research and Development, the Center for Adaptive Technology, and the Center for Management and Technical Assistance, was able to provide technical assistance to 45 small and medium industries in four municipalities. Full details are presented in Appendix 1.

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

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

4. Another study prepared by the FESSC staff during the year is a feasibility study which was published under the title Regeneração de Botracha--Projeto de Viabilidade. At the time this report was being written, the project had not been acted upon by interested investors.

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

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

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

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

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

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

11. Under other AID-funded programs, an audiovisual history of Year I was completed, base-line data of the area were compiled, contributions were made to newsletters, and a curriculum for industrial engineering was developed.

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

In spite of the detrimental factors imposed on the project by the March 1974 flood, all project commitments have been met at this time.

Appendix I  
SUMMARY OF TECHNICAL ASSISTANCE CASES

SUMMARY OF TECHNICAL ASSISTANCE CASES

| <u>No.</u> | <u>Municipality</u> | <u>Product</u>           |
|------------|---------------------|--------------------------|
| 1          | Tubarão             | Food                     |
| 2          | Tubarão             | Electrical Equipment     |
| 3          | Tubarão             | Food                     |
| 4          | Armazém             | Food                     |
| 5          | Tubarão             | Soap                     |
| 6          | Orleans             | Plastics                 |
| 7          | Tubarão             | Wood                     |
| 8          | Tubarão             | Garments                 |
| 9          | Tubarão             | Metalworking             |
| 10         | São Ludgero         | Food                     |
| 11         | Tubarão             | Woodworking              |
| 12         | Tubarão             | Furniture                |
| 13         | Tubarão             | Food                     |
| 14         | Tubarão             | Transportation Equipment |
| 15         | Tubarão             | Woodworking              |
| 16         | Tubarão             | Screws                   |
| 17         | São Ludgero         | Food                     |
| 18         | Tubarão             | Rubber                   |
| 19         | Tubarão             | Shoes                    |
| 20         | Araranguá           | Shoes                    |
| 21         | Parnaíba-Piauí      | Handicrafts              |
| 22         | Tubarão             | Metal Furniture          |
| 23         | Tubarão             | Metalworking             |
| 24         | Tubarão             | Food                     |
| 25         | Tubarão             | Ceramics                 |
| 26         | Tubarão             | Vegetable Oil            |
| 27         | Tubarão             | Bricks and Tiles         |
| 28         | Imbituba            | Woodworking              |
| 29         | Tubarão             | Bricks and Tiles         |
| 30         | Orleans             | Food                     |
| 31         | Tubarão             | Woodworking              |
| 32         | Braço do Norte      | Food                     |
| 33         | Tubarão             | Machine Shop             |
| 34         | Braço do Norte      | Enamel                   |

| <u>No.</u> | <u>Municipality</u> | <u>Product</u>       |
|------------|---------------------|----------------------|
| 35         | Tubarão             | Electrical Equipment |
| 36         | Laguna              | Electric Motors      |
| 37         | Laguna              | Food                 |
| 38         | Tubarão             | Bricks and Tiles     |
| 39         | Tubarão             | Metalworking         |
| 40         | Buenos Aires        | Plastics             |
| 41         | Criciúma            | Ceramics             |
| 42         | Tubarão             | Ceramics             |
| 43         | Tubarão             | Ceramics             |
| 44         | Tubarão             | Appliances           |
| 45         | Tubarão             | Aluminum Working     |

Case No. 1

Main Product: Fruit Juice-Citrics

Municipality: Tubarão

Brief Description of Problem: Company wishes to start producing alcoholic beverages such as rum, and required technical assistance in selecting equipment, plant layout, and manufacturing process.

Applied Solution: Necessary information was obtained and plan was prepared so that company would contact financial sources for necessary funding. Company is now working with the local banks.

Case No. 2

Main Product: Electrical Transformers

Municipality: Tubarão

Brief Description of Problem: Difficulty in expanding their market and lack of good relations with local energy producer from the State of Santa Catarina.

Applied Solution: Contact was made with local energy producer (CELESC), and both companies were then able to review their differences and establish understanding. In the process, a plant layout was prepared and some suggestions were offered for more efficient operation of the industry. Market study is now being performed.

Case No. 3

Main Product: Ice Cream

Municipality: Tubarão

Brief Description of Problem: The manufacturer was having problems with the product freezing both in the plant and at the point of sale.

Applied Solution: The materials utilized were examined and analyzed, and it was found that one of the products under the brand name of "Glintex" was causing the freezing. A new product was recommended and this has proven successful.

Case No. 4

Main Product: Food-freezer Lockers

Municipality: Armazém

Brief Description of Problem: Company wishes to expand its operation but lacks financial resources.

Applied Solution: The management of the company was accompanied on a visit to the Banco do Brasil S. A. and through it obtained the necessary credit. As part of the solution, a study was made of all materials used to assist the company in obtaining more moderately priced raw materials.

Case No. 5

Main Product: Soap and Candles

Municipality: Tubarão

Brief Description of Problem: Management wished to purchase a similar manufacturing operation that was in the process of going bankrupt. It was necessary to determine if the acquisition was financially desirable and if the equipment could be of use to the company.

Applied Solution: Both companies were studied and, in the process, the management of the two companies had a breakdown in their personal relations. As a result, the company requesting technical assistance decided not to enter into this negotiation, but to simply expand its own operation.

Case No. 6

Main Product: Plastics

Municipality: Orleans

Brief Description of Problem: Management was considering expanding their product line and needed additional risk capital.

Applied Solution: A brief study was made of the company and this was presented to the Banco do Brasil S. A., and the bank provided the financing.

Case No. 7

Main Product: Woodworking

Municipality: Tubarão

Brief Description of Problem: The owner of the company was in commercial sales of wood products and wished to establish a sawmill.

Applied Solution: Two solutions were considered: a) contracting with the existing sawmill and becoming a partner in it or b) setting up a new company to operate a sawmill to be installed. In the process of the studies, the staff identified the problem that wood reserves are very low and it is very difficult to obtain raw lumber for operating a sawmill. In view of this, the management of the company decided to negotiate with an existing sawmill and enter into a partnership with it.

Case No. 8

Main Product: Garments

Municipality: Tubarão

Brief Description of Problem: Small cottage industry wished to expand and become small industry. Management was in dire need of funds to carry out this project.

Applied Solution: After evaluating this family enterprise, the staff determined that they had few personal resources, no equipment, and lacked production know-how. It was recommended that they not attempt to establish an industry at this time, and technical assistance was provided in helping them acquire basic garment-industry equipment and improving production processes.

Case No. 9

Main Product: Metalworking

Municipality: Tubarão

Brief Description of Problem: Group of young persons, members of the Junior Chamber of Commerce, wished to invest in a company to manufacture metal scaffolding. They have 13,000 Cruzeiros available as risk capital.

Applied Solution: After analyzing the project, it was considered feasible but the following shortcomings were identified: Lack of funds for this magnitude project and limited experience in this industrial activity. The investors were able to increase their original capital to 100,000 Cruzeiros, and through a bank in Florianópolis they were able to finance the balance. Additional technical staff was contracted, and the plant is now being installed for a total investment of 1 million Cruzeiros.

Case No. 10

Main Product: Food Producer

Municipality: São Ludgero

Brief Description of Problem: The company was overextended in its credit and was about to be foreclosed by the Banco do Brasil S. A.

Applied Solution: A feasibility study was prepared to determine if the company should be rehabilitated and, if so, what funds would be required. As a result of the study, the bank was willing to renegotiate its existing loan to allow the company more time to pay off its debts. The company was meeting all of its obligations when, unfortunately, the March flood wiped out their crops. They are now again renegotiating with the bank for a new disaster loan.

Case No. 11

Main Product: Woodworking

Municipality: Tubarão

Brief Description of Problem: Three young men wished to form a company to produce mouldings, window shades, and similar products.

Applied Solution: The young investors were quite indefinite in their desires and it was not possible to come up with a finite solution. It was suggested to the investors that they further consider what they wished to do and that in the meantime they visit industrial activities in the area to become more familiar with business procedures.

Case No. 12

Main Product: Furniture Manufacturing

Municipality: Tubarão

Brief Description of Problem: Group of investors were interested in the possibility of manufacturing wood furniture.

Applied Solution: A feasibility study was prepared with the assistance of academic staff to determine if the investment was desirable. The interested investors are now trying to implement the project and set up a small furniture plant to serve the local region.

Case No. 13

Main Product: Food

Municipality: Tubarão

Brief Description of Problem: Local businessman wished to enter into the food manufacturing activity. His choice was the manufacturing of sweet potato dessert and mandioc dessert.

Applied Solution: An initial study was prepared by the staff and, at present, this is being expanded to consider the possibilities of exporting the above-mentioned products. Final solution is still underway.

Case No. 14

Main Product: Transportation Equipment

Municipality: Tubarão

Brief Description of Problem: Local investors wished to manufacture dump trucks.

Applied Solution: A feasibility study was prepared considering this manufacturing activity. The study was presented to financial sources for consideration. The process was delayed due to the March flood, but financing was arranged and obtained in the month of October.

Case No. 15

Main Product: Woodworking

Municipality: Tubarão

Brief Description of Problem: Two brothers wished to invest in the establishment of a wood mill. They needed a partner with know-how in the operation of a sawmill.

Applied Solution: Similar to a previous case, the study identified the fact that forestry reserves are at an all-time low and it is practically impossible to obtain raw lumber for this type of operation. It was suggested to the investors that they try to find a partner with existing forestry reserves and then reconsider this investment.

Case No. 16

Main Product: Screws

Municipality: Tubarão

Brief Description of Problem: Investors wished to expand the company to the manufacturing of screws (metal).

Applied Solution: A preliminary study was prepared and through it the staff identified that equipment is very expensive and requires large production for its efficiency. It was also determined that similar national companies have not been successful due to the raw cost (non-competitive) of imported screws. It was suggested to the investors that they invest in an in-depth feasibility study before deciding on this activity.

Case No. 17

Main Product: Mandioc Flour

Municipality: São Ludgero

Brief Description of Problem: This small industry wished to expand and also set up its own electrical generation plant. This expansion was considered in view of the fact that the plant had to be rehabilitated after the flood.

Applied Solution: The necessary study was prepared and financing was obtained to implement the project. The company has proven successful in its expansion and is now considering going into the manufacturing of dough products (noodles, spaghetti, etc.).

Case No. 18

Main Product: Rubber Products

Municipality: Tubarão

Brief Description of Problem: Two investors wished to enter into a venture to manufacture rubber products for the transportation industry.

Applied Solution: Feasibility study was prepared and several similar producers were interviewed to obtain first-hand information on this type of activity. The investors were presented with a report and they are now establishing their small industry.

Case No. 19

Main Product: Shoes

Municipality: Tubarão

Brief Description of Problem: An investor from Uruguay was interested in setting up a small industrial operation to manufacture tennis shoes.

Applied Solution: The necessary feasibility study was prepared and the market was analyzed. It was suggested to the investors that before they enter into this activity they set up a system to wholesale the product throughout the region, otherwise their market potential would not warrant the investment. The investors are still considering what they will do.

Case No. 20

Main Product: Shoes

Municipality: Aranguá

Brief Description of Problem: An investor was interested in setting up a small shoe manufacturing operation in this city.

Applied Solution: A feasibility study was prepared and the investor was taken to visit an existing shoe manufacturer so that he could obtain information from the management of the company. Since then, the investor has rented a small building, acquired the necessary equipment, and is presently operating.

Case No. 21

Main Product: Handicrafts

Municipality: Paranaíba-Piauí

Brief Description of Problem: Small handicraft cooperative wished to acquire simple equipment for leather tannery.

Applied Solution: Contacts were made with companies in this line of business, and equipment information as well as prices were provided to the cooperative. At present, they plan to buy some equipment later in the year.

Case No. 22

Main Product: Metal Furniture

Municipality: Tubarão

Brief Description of Problem: A group of three investors wished to begin manufacturing metal file cabinets. At present, they are representing another manufacturer of the same product and selling it successfully.

Applied Solution: The appropriate study was prepared and it was brought to the attention of the investors that one of the problems they will encounter will be acquisition of raw material for metal fabrication. It was further suggested that they negotiate with the company they now represent and see if some cooperative arrangement could be worked out. The investors are now negotiating with the company they represent.

Case No. 23

Main Product: Metalworking

Municipality: Tubarão

Brief Description of Problem: General information for interested group on financing of industrial project. The group is interested in the concept of setting up a small metalworking industry.

Applied Solution: The interested parties were provided with financial information and were introduced to a local bank. Since then, they have been working directly with the bank trying to obtain a line of credit.

Case No. 24

Main Product: Food

Municipality: Tubarão

Brief Description of Problem: This existing company has had financial problems and, at the time, was facing foreclosure by the bank.

Applied Solution: A study was made of the company, and it was recommended that the executive director be replaced in order to take care of some internal problems. The bank has since then reached an agreement with the company, allowing them more time to pay their loan.

Case No. 25

Main Product: Ceramics

Municipality: Tubarão

Brief Description of Problem: General information to establish small ceramic industry. Investors needed technical assistance in the area of plant layout, equipment, and production process.

Applied Solution: The necessary technical information was provided to the investors and, at present, plant is under construction.

Case No. 26

Main Product: Vegetable Oil

Municipality: Tubarão

Brief Description of Problem: A local firm in the wholesale business of vegetable oil was interested in setting up a small industry to produce similar product.

Applied Solution: A study was prepared to determine if it would be feasible to establish another producer of vegetable oil in the area. It was determined through the studies that there is a limited capacity of available raw material at this time and that it would be best to wait until proper crop production was sufficiently increased.

Case No. 27

Main Product: Brick and Tile

Municipality: Tubarão

Brief Description of Problem: The investors desired a feasibility study to determine if they should establish a small plant to manufacture brick and roof tile.

Applied Solution: The study was completed and presented to a local bank which financed the project. The company is now building a plant and will be in operation early in 1975.

Case No. 28

Main Product: Wood Truck Bodies

Municipality: Imituba

Brief Description of Problem: A group of investors wished to obtain financing to establish a woodworking operation. They plan to manufacture wood truck bodies.

Applied Solution: A study was completed indicating that this was a feasible investment. The project has been financed and it is estimated that there will be a total investment of 600,000 Cruzeiros.

Case No. 29

Main Product: Brick and Tile

Municipality: Tubarão

Brief Description of Problem: This company, already in operation, wished to improve its existing plant facility and build a new brick oven.

Applied Solution: Management of the company was taken to visit several operations in the municipality of Tijucas. An appropriate type of oven was identified and copied, and it is presently being built at the site of this industry.

Case No. 30

Main Product: Food

Municipality: Orleans

Brief Description of Problem: A group of farmers were interested in the manufacturing of palletized mandioc flour.

Applied Solution: A market study was completed on this product and on the availability of raw materials. It was determined that it was not feasible economically to produce this product on the basis of present mandioc prices. The investors decided not to establish the industry.

Case No. 31

Main Product: Wood Forms

Municipality: Tubarão

Brief Description of Problem: Investors were interested in the manufacturing of wood forms for construction industry.

Applied Solution: A project study was prepared by staff of FESSC and given to the investors. Shortly thereafter they decided to go into business and the industry is now being established.

Case No. 32

Main Product: Food

Municipality: Braço do Norte

Brief Description of Problem: Company was interested in expanding operations into the manufacturing of dough products.

Applied Solution: The appropriate study was conducted and the company carried out the expansion.

Case No. 33

Main Product: Machine Shop

Municipality: Tubarão

Brief Description of Problem: This company was having financial problems. The company did not approach FESSC staff with the problem. They were directly contacted by the staff.

Applied Solution: A study was made of the company which manufactures equipment for making roof tiles. After the flood, it was suggested that they change their administration and their internal procedures which has helped the company financially.

Case No. 34

Main Product: Enamel

Municipality: Braço do Norte

Brief Description of Problem: Need of funds to rehabilitate after the flood.

Applied Solution: A financial study was prepared and taken to the regional development branch and financing was obtained.

Case No. 35

Main Product: Electrical Equipment

Municipality: Tubarão

Brief Description of Problem: Limited financial capability and administrative problems.

Applied Solution: A financial study was made of the company and it was identified that part of the problem was due to the flood. A second study is now under process, after having provided a training program for supervisors at this plant. The second study should be completed before the end of this program year.

Case No. 36

Main Product: Electric Motors

Municipality: Laguna

Brief Description of Problem: A local manufacturer wished to change its production from gasoline engines to electric or diesel engines, in view of the energy crisis.

Applied Solution: Information was requested from the Georgia Institute of Technology on this case. Since then, the manufacturer has purchased several pieces of capital equipment that were needed and the project is still open. It is anticipated that this project will be finished early in 1975.

Case No. 37

Main Product: Food

Municipality: Laguna

Brief Description of Problem: Company went bankrupt after the flood. They were processing rice.

Applied Solution: Appropriate financing study was made of the company, and it was determined that the company could be rehabilitated. A local bank provided part of the needed financing, and an arrangement was worked out with the creditors to allow the company to go back into business. The company is presently operating and still receiving technical assistance.

Case No. 38

Main Product: Brick and Tile

Municipality: Tubarão

Brief Description of Problem: Unacceptable end product with a normal production reject of up to 50%.

Applied Solution: A complete industry study is still underway to determine if the problem was caused by raw material, equipment, drying procedures, or others. The study has yet to be completed, but it is anticipated that it will be completed by the end of the first quarter of 1975.

Case No. 39

Main Product: Metalworking

Municipality: Tubarão

Brief Description of Problem: The investor is interested in manufacturing nails for the construction industry.

Applied Solution: A study of this industry was completed and it was determined that often this industry is subject to "dumping practices." Additional information was gathered at the request of the investor and the final study was presented to him. The investor is still considering whether to go into this business or not.

Case No. 40

Main Product: Plastics

Municipality: Buenos Aires, Argentina

Brief Description of Problem: This is a plastics manufacturer located in Buenos Aires who has had to close his operation due to the lack of raw material. He is interested in relocating his company in Brazil.

Applied Solution: Complete information on Brazil and the region was provided to the investor, as well as other desirable data. The investor decided to establish in either São Paulo or Tubarão. He is still considering his decision.

Case No. 41

Main Product: Metalcasting

Municipality: Criciuma

Brief Description of Problem: Industrialist was considering establishing a small metalcasting operation.

Applied Solution: Appropriate reports were made for this industry. At present, the investor continues to be interested and a feasibility study is now being prepared.

Case No. 42

Main Product: Ceramics

Municipality: Tubarão

Brief Description of Problem: Investor has initial feasibility study for an investment of 4.5 million Cruzeiros to manufacture ceramics.

Applied Solution: Appropriate market study has been conducted and, at present, the staff continues to work with this group of investors. The project is still open.

Case No. 43

Main Product: Ceramics

Municipality: Tubarão

Brief Description of Problem: Request for special incentives from the municipality of Tubarão.

Applied Solution: The problem was reviewed by the staff and presented to the municipality on behalf of the company. It appears that the municipality will authorize the requested special incentive.

Case No. 44

Main Product: Appliances

Municipality: Tubarão

Brief Description of Problem: Company has requested special incentives from the municipality.

Applied Solution: The FESSC staff prepared the appropriate documentation and requested the incentives on behalf of the manufacturer from the municipality of Tubarão. Incentives were authorized by the municipality.

Case No. 45

Main Product: Aluminum Working

Municipality: Tubarão

Brief Description of Problem: Company requested special incentives from the municipality of Tubarão.

Applied Solution: The staff prepared the necessary documents and presented them to the municipality on behalf of the manufacturer. Special incentives were authorized by the municipality.

Appendix 2  
TRAINING PROGRAM FOR FESSC TECHNICAL STAFF

TRAINING PROGRAM FOR FESSC TECHNICAL STAFF  
January 6 - February 4, 1975

First Week

|           |           |   |
|-----------|-----------|---|
| Monday    | Morning   | Welcome and introduction to Atlanta, Georgia, Georgia Tech, and E3S.                      |
|           | Afternoon | Study period.   |
| Tuesday   | Morning   | Elements of Industrial Development.   |
|           | Afternoon | Study period.   |
| Wednesday | Morning   | Elements of Industrial Development (Continued) and the Universe of Industrial Development |
|           | Afternoon | Study period.   |
| Thursday  | Morning   | Economic Geography.   |
|           | Afternoon | Study period and work on term projects.   |
| Friday    | Morning   | Economic Geography (Continued).   |
|           | Afternoon | Study period and work on term projects.   |

Second Week

|           |           |   |
|-----------|-----------|---|
| Monday    | Morning   | Regional Development.                           |
|           | Afternoon | Work on term projects.                          |
| Tuesday   | Morning   | International Industrial Development.           |
|           | Afternoon | Study and work on term projects.                |
| Wednesday | Morning   | Industrial Location.                            |
|           | Afternoon | Study and work on term project.                 |
| Thursday  | Morning   | Analysis of Potential Industrial Opportunities. |
|           | Afternoon | Plant visit.                                    |
| Friday    | Morning   | Manual of Industrial Development.               |
|           | Afternoon | Plant visit.                                    |

Third Week

|         |           |   |
|---------|-----------|---|
| Monday  | Morning   | Manual of Industrial Development (Continued). |
|         | Afternoon | Visit SBA.                                    |
| Tuesday | Morning   | Manual of Industrial Development (Continued). |
|         | Afternoon | Study and work on term project.               |

Third Week (Continued)

|           |           |   |
|-----------|-----------|---|
| Wednesday | Morning   | Theory of Industrial Dynamics.                |
|           | Afternoon | Study and plant visit.                        |
| Thursday  | Morning   | Problems of Small and Medium-Size Industries. |
|           | Afternoon | Study and work on term project.               |
| Friday    | Morning   | Problems of Small and Medium-Size Industries. |
|           | Afternoon | Plant visit.                                  |

Fourth Week

|           |           |  |
|-----------|-----------|--|
| Monday    | Morning   | Simulation of Industrial Development Cases.            |
|           | Afternoon | Visit industrial park.                                 |
| Tuesday   | Morning   | Simulation of Industrial Development Cases (Continued) |
|           | Afternoon | Visit industrial park and districts.                   |
| Wednesday | Morning   | Market Analysis.                                       |
|           | Afternoon | Study and work on term projects.                       |
| Thursday  | Morning   | Export Promotion.                                      |
|           | Afternoon | Visit U.S. Department of Commerce                      |
| Friday    | Morning   | Industrial Promotion.                                  |
|           | Afternoon | Visit industrial development organization in Atlanta.  |

Fifth Week

|           |           |  |
|-----------|-----------|--|
| Monday    | Morning   | Technology Transfer Problems.                      |
|           | Afternoon | Study and plant visit.                             |
| Tuesday   | Morning   | Technology Transfer Problems (Continued).          |
|           | Afternoon | Study and visit Georgia Tech's Research Units.     |
| Wednesday | Morning   | Determination of Adequate Intermediate Technology. |
|           | Afternoon | Industrial visit.                                  |
| Thursday  | Morning   | Determination of Adequate Intermediate Technology. |
|           | Afternoon | Study and work on term project.                    |
| Friday    | Morning   | Visit to field office (all day).                   |

Sixth Week

|           |           |  |
|-----------|-----------|--|
| Monday    | Morning   | Preparation of Manufacturing Feasibility Studies.    |
|           | Afternoon | Industrial visits.                                   |
| Tuesday   | Morning   | Preparation of Manufacturing Feasibility Studies.    |
|           | Afternoon | Work on term project.                                |
| Wednesday | Morning   | Quality Control in Small and Medium-Size Industries. |
|           | Afternoon | Work on term project.                                |
| Thursday  | Morning   | Quality Control in Small and Medium-Size Industries. |
|           | Afternoon | Work on term project.                                |
| Friday    |           | Presentation of term project and end of course.      |

Appendix 3  
PROVISIONAL PROCEDURES FOR THE OPERATION  
OF THE BASIC DATA CENTER

PROVISIONAL PROCEDURES FOR THE OPERATION OF  
THE BASIC DATA CENTER

Fundação Educacional do Sul de  
Santa Catarina  
Tubarão, Santa Catarina  
Brazil

by

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Project B-427

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## Preface

These procedures are written to provide guidelines of a basic nature for the establishment of the Basic Data Center (CDB) at the Fundação Educacional do Sul de Santa Catarina (FESSC), Tubarão, Brazil. Since these procedures are expected to be adjusted from time to time to increase efficient performance, the addition of the word "Provisional" in the title is appropriate.

Many of these procedures were developed from the publication of the Basic Data Branch entitled Information Support for Development Agencies: A Community Action Program and from the List of Subject Headings for Indexing and Filing Industrial Development Collections, published by the American Industrial Development Council.

## OBJECTIVES

There are three primary objectives of the Fundação Educacional do Sul de Santa Catarina (FESSC):

1. Determine the socioeconomic situation in the 32 cities of the Southern State of Santa Catarina.
2. Discover what FESSC can do to transform the Southern State of Santa Catarina into a higher level of industrial activity.
3. Improve the socioeconomic condition of all of its people.

These objectives are to be achieved through establishment and operation of six centers listed below in order of priority:

1. Administration, Management, and Technical Assistance Center
2. Adaptive Technology Center
3. Community Development Center
4. Public Administration and Regional Planning Center
5. Bio-sanitary Center
6. Anthropological Research Center

The objective of the Basic Data Center (CDB) is to provide support information to FESSC in the implementation of its programs.

## LIBRARIANS

The proper operation of a data center is not a simple matter. The philosophy of librarianship and the techniques of management, selection, acquisition, classification, and reference are not generally known and require specialized training. To ensure the success of CDB, a university trained librarian should be a full-time professional staff member. However, if a full-time position is not feasible, a librarian should be available for some period each day or at least for a few hours each week.

The librarian is a professional -- not a clerk. A full-time typist, other clerical help, and student assistants must be available to carry out the routine work of CDB.

A list of library schools and training courses in documentation available in Brazil is shown in Appendix 4.

## REFERENCE

Reference is what the CDB is all about. The CDB exists to provide answers to user inquiries and information requirements. If CDB cannot answer the question from its collection, the staff of CDB is to go all out to help the user locate the answer in other collections or from other sources.

Reference is the activity of CDB in which the users are assisted in locating needed information. This activity takes several forms. One form is providing quick answers to short questions such as names of people or companies, addresses of organizations, and location of statistical report. Another form would involve lengthy and detailed searching of all available publications for a specific set of facts. Another form of reference service would be notifying staff members of newly arrived articles or publications having contents of continuing interest to them. It is important to record requests for reference assistance which CDB is unable to fill. These unfilled requests form a basis for selection of new publications.

CDB is not to be a technical library. Rather it is to be the one source in which will be found information about Tubarão and the South Santa Catarina area. It is expected that CDB will eventually have those basic, first level publications concerning the most important commercial activities of South Santa Catarina, but the more complicated, detailed, and sophisticated technical and engineering needs will be provided through Brazilian organizations and other international groups.

## RETRIEVAL OF PUBLICATIONS

To locate a publication on the shelves, follow these procedures:

1. If you know the author, find the author card in the card catalog. Read the number in the upper right corner. This number (0001, 0142, or some such number) will be the shelf location number, and the publications will be on the shelf in numerical order.

2. If you know the title, find the title card in the card catalog. Read the number in the upper right corner and follow procedures outlined above in paragraph 1.

3. If you know neither the author nor the title, look at the card in the subject card section of the card catalog. Each publication will appear on one or more subject cards. Look at the subject cards until you find a publication fitting your needs. Read the number in the upper right corner and follow procedures outlined above.

4. Periodicals will have no number to indicate their location. Periodicals are arranged on the shelves alphabetically by title.

## TYPES OF INFORMATION

The Basic Data Center (CDB) should obtain the following types of information in support of each of the FESSC programs:

### A. Administration, Management, and Technical Assistance

These publications provide detailed instructions for the planning, establishment, operation, management, and maintenance of a specific industry or business or individual operation within a manufacturing process. These sources of industrial information comprise the following:

1. Sources of information on industrial techniques, processes, know-how, and management data (e.g., handbooks, reference books, periodicals, manuals, guides to information sources, and directories of professional organizations).
2. Sources of information on industrial equipment, products, and companies (e.g., directories, export guides, special reports, market surveys, trade and company literature, Chamber of Commerce journals and handbooks).
3. Publications of a general nature (e.g., newspapers, news magazines).
4. Research and progress reports, published and otherwise, from laboratories and manufacturing enterprises.
5. Audiovisual materials.
6. Sources of information on scientific and technical developments and experiences.<sup>1/</sup>

### B. Community Development, Public Administration and Regional Planning

These sources of information are described in Information Support for Development: A Community Action Program - Appendix 1.

### C. Adaptive Technology

The Adaptive Technology Center will require information of a highly specialized nature. Technology employed in local industries can be determined by on-site visits and interviews.

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<sup>1/</sup>UNIDO. Information Units in Small Plants, 1973, pg. 9.

The knowledge of technology capable of being adapted to local industry can be acquired from several sources.

1. Engineers and technicians in the State of Santa Catarina who can assist should be identified, contacted, and their level of cooperation determined.
2. Three national institutions should be visited and arrangements made for continuing assistance:

Instituto Brasileiro de Bibliografia e Documentação  
Rio de Janeiro

Institute for Technological Research  
São Paulo

National Institute of Technology  
Rio de Janeiro

From these three institutes can be obtained technical information and assistance, pilot plant studies, industrial information, industrial evaluations, industrial applications of research work, supplier and trade associations information, and other information relative to adaptive technology.

International organizations should be contacted for information and assistance. Some of these organizations have offices in Brazil.

Some of the organizations to contact are listed below:

Intermediate Technology Development Group Limited  
London, England

UNESCO  
Serviço de Publicações  
Fundação Getúlio Vargas  
Caixa Postal 21120 Praia de Botafogo 183  
Rio de Janeiro, G.B.

UNESCO  
1320 Bulevar Artigas  
Apartado de Correos 859  
Montevideo, Uruguay

UNIDO  
Felderhaus  
Rathausplatz 2  
P. O. Box 707  
1010 Vienna  
Austria

UNIDO  
United Nations  
New York, New York 10017

United Nations Development Program (UNDP)  
United Nations  
New York, New York 10017

Food and Agricultural Organization  
Viale delle Terme di Caracalla  
Rome, Italy

Food and Agricultural Organization  
Casilla 10095  
Santiago, Chile

United Nations  
Apt. 201  
Cruz Street No. 19  
Rio de Janeiro, Brazil

International Labor Organization  
CH1211  
Geneva 22, Switzerland

International Labor Organization  
Caixa Postal 607-ZC-00  
Rua da Gloria 190  
Apt. 20  
Rio de Janeiro, Brazil

World Bank Group (IMF)  
19th and H Streets NW  
Washington, D.C. 20431

UNISIST  
Division of Scientific and Technological  
Information Documentation  
UNESCO  
7, Place de Fontenoy  
75700 Paris, France

UNESCO  
7, Place de Fontenoy  
75700 Paris, France

#### D. Bio-Sanitary

Since medical literature is so vast, the Bio-Sanitary Center cannot realistically expect to acquire much more than a good basic collection of reference publications. These publications will provide information on indigenous medical problems of Santa Catarina and support the teaching and research work of the Center, faculty, and staff. The faculty and staff should recommend to CDB most of the publications they require.

The existing medical schools, bio-sanitary centers, and related research centers in Brazil have publications. It will be necessary to gain access to these publications through an interlibrary loan agreement or in-house use privileges.

The World Health Organization should be contacted and asked to provide books and equipment.

If in the State of Santa Catarina there is not now a computer facility to search tapes of the Chemical Abstracts and other basic data bases, it might be useful to ask the World Health Organization or UNIDO to establish at FESSC a facility to provide bio-sanitary and medical research information to other such institutions in Santa Catarina and Brazil. If these tapes are available elsewhere in Brazil, perhaps UNIDO or WHO would provide to FESSC a computer terminal through which searching can be done.

#### E. Anthropological

The information for the Anthropological Center will support the three major activities of teaching, researching, and displaying.

The faculty should recommend for acquisition appropriate handbooks, guides, serials and journals, and other publications directed primarily toward the teaching and researching activities.

The information center should independently acquire other information such as maps (historical, geological, hydrological, weather, road, contour, and EROS satellite), area histories, weather data, soil studies, journals and reports from other anthropological center, other information that would help to reveal the history of the state, and conditions in existence today resulting from historical influences. Another important function would be to display and make available for study and inspection products created or discovered by the Anthropological Center. These products will range from simple photographs to intricately reconstructed artifacts recovered from excavations. These activities will require the information center to acquire handbooks and guides concerning the preparation and display of these items. The word "acquisitions" refers to all of those activities followed to get possession of the publications selected to be acquired by CDB. These documents will be acquired as unsolicited gifts, solicited gifts, purchase, or exchange.

##### 1. Unsolicited gifts

As soon as the CDB becomes organized and operational, various people from the college, industry, and other organizations will give publications to the center. Each donor should receive

acknowledgement for his gift. The CDB will keep only those gift publications which fulfill the requirements of the selection criteria.

2. Solicited gifts

Many publications, especially pamphlets and reports, can be acquired free of charge from the report author or publishing organization. Diligent searching of all incoming publications will reveal the existence of new publications which can be acquired at no cost to the CDB.

3. Exchange

Contacts by letter and personal visits to organizations producing publications can result in agreements to exchange FESSC-produced publications for publications produced by the other organizations. Some of these organizations are:

- a. Libraries -- university, research and corporate
- b. Research institutions
- c. Government organizations
  - City
  - State
  - National
- d. International organizations
  - UNIDO
  - UNESCO
  - UNDP
  - FAO
  - ILO
  - UNISIST
- e. Embassies and consulates
- f. Chambers of commerce
- g. U.S. Book Exchange
  - 3335 V Street, N. E.
  - Washington, D. C. 20018
- h. National Exchange Centres

4. Purchase

Using the purchase procedures established by FESSC, the CDB will buy those publications selected for acquisition. Some of these publications can be purchased directly from the issuing agency,

but others must be purchased through book or magazine agents located in Santa Catarina, Porto Alegre, Rio de Janeiro, São Paulo, Brasília, Buenos Aires, Argentina, Mexico City, Madrid, London, Paris, New York, Vienna, and other places.

For each publication ordered, a record must be kept which will show the full citation of the publication, its cost, agent, date of ordering, and other pertinent information. When the publication is received, the actual publication and its invoice must be checked against the original order. Periodically the order file must be checked to determine non-deliveries of publications and proper follow-up action taken.

## OPERATIONAL PROCEDURES

### Objective

The objective of these procedures is to arrive at a method for placing all publications on the shelves in a systematic and orderly manner so that each publication has one definite shelf location and is therefore easily retrievable.

## LOCATION ON SHELVES

Since only a relatively small number of publications will be acquired by CDB, only a simple system is required. This system needs a few cards for each publication -- an author card, a title card, one or more subject cards, one card for GIT, and a shelf list card.

Pamphlets, books, and directories housed in pamphlet boxes will be assigned an accession number which will indicate the shelf location for the publication.

Maps will be housed in vertical files or other suitable places and will be arranged by titles in alphabetical order.

Periodicals will be housed in pamphlet boxes and arranged on the shelves by titles in alphabetical order.

## PROCESSING PUBLICATIONS

1. If the publication is a periodical, fill out cards for the card catalog. File one card in author section. File one card in the title section according to its alphabetical order. File a second card in a separate file that lists all periodicals. Send the fourth card to GIT.

2. If the publication is a pamphlet, book, or directory, fill out cards for the card catalog. File one card in the author catalog according to its alphabetical order. File one card in the title catalog according to its alphabetical order. Send one card to GIT. File one card in shelf list file according to its numerical order.

3. For all publications determine in what subject category the publication falls. Determine the subject category from one or more subject headings chosen from the master list of subject headings used by CDB. File these subject cards in the subject file of the card catalog according to their alphabetical order.

Sample cards are shown on the following page.

SUBJECT CARD

|           |       |
|-----------|-------|
| Subject   |       |
| Author    |       |
| Title     |       |
| Publisher | Place |
| Date      | Pages |
| Subjects  |       |

|   |       |
|---|-------|
| Whitlatch, George I   | 0001  |
| Industrial  |       |
| Industrial Development Division, Georgia Institute of<br>Technology, Atlanta, Georgia, U.S.A. |       |
| 1970  | 72 p. |
| Industrial Sites  |       |

AUTHOR CARD

|           |       |
|-----------|-------|
| Author    |       |
| Title     |       |
| Publisher | Place |
| Date      | Pages |
| Subjects  |       |

TITLE CARD

|           |       |
|-----------|-------|
| Title     |       |
| Author    |       |
| Title     |       |
| Publisher | Place |
| Date      | Pages |
| Subjects  |       |

INDUSTRIAL SITES

Whitlatch, George I

0001

Industrial Sites

Industrial Development Division, Georgia Institute of  
Technology, Atlanta, Georgia, U.S.A.

1970

72 p.

Industrial Sites

INDUSTRIAL SITES

Whitlatch, George I

0001

Industrial Sites

Industrial Development Division, Georgia Institute of  
Technology, Atlanta, Georgia, U.S.A.

1970

72 p.

Industrial Sites

PERIODICAL CARD

|           |       |
|-----------|-------|
| TITLE     |       |
| Publisher | Place |
| Frequency | Cost  |
| Renewal   | Date  |
| Subjects  |       |

PERIODICAL CARD-SUBJECT

|           |       |
|-----------|-------|
| SUBJECT   |       |
| Title     |       |
| Publisher | Place |
| Frequency | Costs |
| Renewal   | Date  |
| Subjects  |       |

KOREA TODAY

Department of Commerce, Republic of Korea, Seoul, Korea

Monthly

400 Won

January

Economic Conditions

ECONOMIC CONDITIONS

KOREA TODAY

Department of Commerce, Republic of Korea, Seoul, Korea

Monthly

400 Won

January

Economic Conditions

## FILING CARDS

### Pamphlets - Books - Directories

1. One card to author file.
2. One card to title file.
3. One or more cards to subject file.
4. One card to shelf list file.
5. One card to GIT.

### Periodicals

1. One card to periodical file.
2. One card to title file.
3. One or more cards to subject file.
4. One card to GIT.
5. One card to author file.

File cards alphabetically using the "word by word" filing system -- see Appendix 5.

## SUBJECT HEADINGS ASSIGNMENT

### Community Development, Public Administration, and Regional Planning Publications

To begin assignment of subject headings, a basic list of terms has been selected for use. These terms come from the AIDC's LIST OF SUBJECT HEADINGS FOR AN INDUSTRIAL DEVELOPMENT ORGANIZATION. As the collection grows, additional headings may be chosen from the larger list identified as "Headings for General Material" in the AIDC list. The subject headings chosen for the first year, however, should be selected from the list provided. Rules for the selection of headings are listed in the first part of the AIDC list. See pages 1, 2, and 33 in Appendix 3.

### Administration, Management, Technical Assistance, and Adaptive Technology Publications

Subject headings for the technology materials should be chosen from the publication, Thesaurus of Scientific and Engineering Terms, Engineers Joint Council, New York. Thesaurus is a precise guide for librarians to follow for subject headings selection and for information retrieval.

### Bio-Sanitary Publications

Subject headings for the Bio-Sanitary Center's publications could be chosen from Part 2 of the January issue of Index Medicus, "Medical Subject Headings." This annual list is the authoritative list for the catalog of the National Library of Medicine, Washington, D.C., USA.

### Anthropology Publications

Subject headings for the publications acquired for the Anthropology Center could be chosen from the subject index of the annual publication, International Bibliography of Social and Cultural Anthropology. Another possible source for more detailed subject headings could be the Handbook of South American Indians by Julian Haynes Steward.

SUBJECT HEADINGS  
USED BY THE CDB FOR  
COMMUNITY DEVELOPMENT, PUBLIC ADMINISTRATION,  
AND REGIONAL PLANNING

Advertising  
Agriculture  
Biographical Sketches  
Climate  
Communication Media: Radio, Television, Press Facilities  
Community Attitudes  
Company Information  
Consolidations and Mergers  
Construction  
Cost of Living  
Cultured Facilities and Programs  
Directories  
Economic Conditions and Economic Industry  
Educational Facilities  
Employment and Unemployment  
Financial Data  
Financial Institutions  
Forecasts and Trends  
Geography: Characteristics and Distinctive Features of an Area  
Government: Farm Organization  
Government Regulations  
Government Services  
Health Facilities and Services  
Highways and Streets  
History  
Housing and Residential Areas  
Income  
Industrial Buildings  
Industrial Districts  
Industrial Sites  
International Aspects  
Labor Force  
Labor Relations

Labor Unions  
Land Use  
Manufacturing  
Market Surveys  
Medical Facilities and Services  
New Plants and Expansions  
Organizations and Associations  
Plant Layout  
Population  
Products  
Public Utilities  
Raw Materials  
Realtors  
Recreation  
Research  
Resources  
Retail Trade  
Service Industries  
Shopping Centers  
Statistics  
Taxation  
Technology and Processes  
Tourism  
Traffic  
Transportation  
Urban Renewal  
Wages  
Warehouses  
Wholesale Trade

## GIT CARDS

To assist CDB in developing its card catalog, one author card will be sent to Richard Johnston at Georgia Tech. This card can be examined at Georgia Tech and, if required, suggestions can be made to change the card to make it more effective. These cards will be filed at GIT so that FESSC personnel in training at GIT can be aware of the collection at FESSC and so that GIT personnel going to Tubarão can better plan on their informational requirements needed at FESSC. Persons from other counterpart countries can also see the types of information being collected by fellow counterpart organizations.

## PERIODICALS

Periodicals published in Brazil can be ordered directly from the publishers. Periodicals published in most other countries can best be ordered through an agent such as Libris Agencia Literaria Ltda. or Livraria Interciencia, Ltda., both located in Rio de Janeiro. Probably there are other agents in São Paulo, Porto Alegre, or Florianópolis who could order the periodicals. The local newspapers of the State of Santa Catarina could be ordered direct if CDB is unable to get them free of charge.

As each issue is received at CDB it should be recorded on the periodical control card. This control card enables the staff of CDB to know which issues have not been received and need to be re-ordered.

After being recorded on the control card, each periodical is routed to the various staff members of FESSC. When the periodical is finally returned to CDB, the significant articles are indexed and these index cards are then filed in the periodical index card file. After indexing, the periodical is then stored in its pamphlet box on the shelf. These periodicals are so arranged that the most recent issue is on the right and so that the title page faces to the left.

## NEWSPAPER CLIPPINGS

Newspapers should be purchased from each county in the State of Santa Catarina, from Florianópolis, and from each capital city in the states adjacent to the State of Santa Catarina. A major newspaper from Rio de Janeiro, Santos, São Paulo, and Brasilia should also be purchased.

Each of these newspapers should be read and articles clipped that have information about or concern the welfare of the Tubarão or South Santa Catarina area. The list of subject headings that follows this section could be used for these clipped articles, but additional subject headings may be added when needed.

Each article selected for clipping will be cut out and posted upon a sheet of paper onto which has been typed at the top left corner the appropriate subject heading. Examples could be:

Tubarão - Agriculture - Daily News, 24 October 1974

Tubarão - Economic Conditions, Daily News, 24 October 1974

Articles to be clipped concerning income-producing activity will have a special heading called the commerce and industry clippings. Example:

Tubarão - Commerce and Industry - ABC, S. A. - Daily News, 24 October  
1974

Florianópolis - Commerce and Industry - XYZ, S. A. - Daily News,  
24 October 1974

Following each subject heading will be typed the title of the newspaper and the date of publication. Example:

Florianópolis - Port Facilities - Daily News, 24 October 1974

Each clipping will be filed first by its geographical heading and next by its subject heading. Examples:

Florianópolis - Commerce and Industry - ABC, S. A.

Florianópolis - Port Facilities

Tubarão - Agriculture

Tubarão - Commerce and Industry - XYZ, S. A.

Tubarão - Economic Conditions

SUBJECT HEADINGS FOR NEWSPAPER CLIPPINGS

COUNTY:

AGRICULTURE

AIR TRANSPORTATION

ANNEXATION

AREA REDEVELOPMENT

CLIMATE

COMMUNITY AGENCIES

CONSTRUCTION

CONVENTIONS

DIRECTORIES

ECONOMIC CONDITIONS

PORT FACILITIES

RECREATION

RETAIL TRADE

SHOPPING CENTERS

TAXATION

TOURIST TRADE

TRANSPORTATION

URBAN RENEWAL

UTILITIES

WAGES

ECONOMIC OPPORTUNITY PROGRAM

EDUCATION

EMPLOYMENT

GOVERNMENT

GOVERNMENT FINANCE

HEALTH

HIGHWAYS AND STREETS

HOUSING

INCOME

LOCAL HEADINGS

INDUSTRIAL BROCHURES

INDUSTRIAL DEVELOPMENT AGENCIES

INDUSTRIAL SITES

LAWS AND ORDINANCES

MANPOWER

MAPS

MILITARY INSTALLATIONS

NATURAL RESOURCES

PLANNING

POLLUTION

POPULATION

## CIRCULATION

"Circulation" is the term used to describe the activities whereby publications are made available to the FESSC staff and other users and then replaced on the shelves for storage and future use.

All new periodicals will be delivered to the staff.

The staff will take from the CDB for temporary use whatever publications they need.

The staff will return all publications to one designated location in the quarters of the CDB.

Each staff member will record on a register the publications he is taking from CDB. He will list the publication's title, number, and his initials. When these publications are returned to CDB, the student assistant will indicate the return of the publication on the register by marking through with a pencil the entry made by the person who checked out the publication. The student assistant will then replace each publication in its proper shelf location.

Appropriate statistics can be generated from the circulation records. These statistics can indicate the volume of usage, the subjects of interest, and the types of publications needed for future acquisition.

## BUDGET

The CDB will operate under certain financial constraints. Previous to the start of each new fiscal year, a budget must be prepared to provide guidelines to enable the operations of CDB to remain within the limitations established by higher authorities. The budget must indicate the amount of money required for periodical and newspaper renewals, for new book and pamphlet purchases, for equipment and supply needs, and for other services and items required for CDB operation. Each month the actual expenditures incurred must be checked against the budget projections, and proper adjustments to expenditures can then be made to conform with budget figures.

## OUTSIDE SOURCES OF INFORMATION

Since no one library can possibly supply all of the publications required by its patrons, it will be necessary for CDB to identify and locate useful publications elsewhere in the community. A record of the location of other organizations of publications highly useful to CDB should be compiled, kept up to date, and made available to the staff. Some organizations to contact in Tubarão are:

1. The Tubarão departments of water, health, and light
2. Associação Comercial Industrial de Tubarão
3. Banco do Estado de Santa Catarina S. A.
4. Camara Junior
5. Centaris Electricas do Sul do Brasil, S. A.
6. Companhia Catarinense de Telecomunicações
7. Instituto Nacional de Previdencia Social
8. Rede Ferroviaria Federal S. A.
9. Reflorestadora Catarinense S. A.

Similar organizations in Florianópolis should be contacted. Other organizations to contact are:

1. Associação Brasileira de Normas Tecnicos. Rio de Janeiro
2. Diario Oficial for Brazilian patents
3. Instituto Argentino de Racronalizacion de Materials, Buenos Aires, Argentina
4. Instituto Brasileiro de Bibliografia e Documentação (IBBD), Rio de Janeiro
5. The technical institutes and libraries in Porto Alegre
6. See Appendix 2 for a list of organizations in Brazil responsible for documentation and library services.

## PUBLICATIONS AND PUBLICITY

Publications will be produced by the CDB for two main purposes:

1. To provide written instructions to the staff enabling them to make better use of the collection, e.g., special bibliographies, accession lists, guides and handbooks to the holdings of CDB.
2. To provide favorable publicity for the CDB from potentially helpful outside agencies, e.g., directories of various types, lists of articles indexed from periodicals at CDB, services at CDB available to the citizens of South Santa Catarina, and a newsletter.

To learn of the existence of publications useful to CDB, it is necessary to be aware of the many different organizations having valuable information. A way to learn about these organizations is to publish a newsletter from CDB or FESSC and to distribute it as widely as possible both nationally and internationally. In return, many of these organizations receiving the CDB newsletter will send their own newsletter and lists of their available publications.

## EQUIPMENT AND SPACE

The space available for CDB is adequate for the present and for several years to come. There is a need for some additional equipment. The equipment that should be acquired is listed below:

1. Card catalog file -- minimum 20 drawers
2. Microfilm and microfiche readers and printer
3. Pamphlet boxes
4. Additional shelving in the future
5. Additional vertical files

When contemplating the acquisition of new equipment, always try to determine the requirements five years hence and purchase enough to fulfill these long-term needs.