

5960000,06  
ID - ARW-175  
140-46135

17

FINAL REPORT  
OF  
THE CENTRAL AMERICAN INSTITUTE FOR  
INVESTIGATION AND INDUSTRIAL  
TECHNOLOGY  
ICAITI

January 1984

AAA-2358

## TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
CONSULTANT'S ASSESSMENT	
INTRODUCTION.....	i
OBJECTIVES AND METHODOLOGY.....	ii
I. FINDINGS.....	I-1
A. Organizational.....	I-1
B. Technical.....	I-3
C. Financial.....	I-11
II. ISSUES.....	II-1
III. CONCLUSIONS AND RECOMMENDATIONS.....	III-1

## CONSULTANT'S ASSESSMENT

ICAITI has, through its facilities in Guatemala and its technical services, actively supported industrial development and applied technology in Central America since 1955.

The institution carries out a number of services such as: product research and testing; the collection and creation of technical information and distribution; standards setting; quality control and certification; training and technical assistance.

ICAITI is primarily identified with agro-industry and energy, although its testing and technical assistance activities include support to many other industrial sectors.

Its training activities are short-term and tailored to the specific needs of its clientele.

ICAITI maintains strong linkages with the external donor community, and informal linkages with universities and research and technical facilities outside of the region.

The role of ICAITI will continue to be much the same in the future. It will include applied research, training, demonstration, testing and technical assistance. However, it is likely that increasing emphasis will be placed on meeting the industrial needs of small and medium scale companies, while continuing to meet the needs of larger industry and the national governments. Should the economies of the Central American countries improve, or Central American common market activities increase, the volume of work performed by ICAITI should increase considerably.

AID's use of ICAITI in the future should be as it has been in the past; as a project implementator. Much of the agency's program policy falls within the technical capacity of the institution's staff: e.g., energy conservation, food technology and agroprocessing, appropriate technology and private sector development.

The institution is sound, its services, based on our interviews with private sector industrialists and national government representatives, are of a high quality, and its certification is widely accepted in the region as well as internationally.

ICAITI, probably more than any of the regional institutions, is influenced by Central America's economic conditions. For that reason it is heavily dependent on external donors to be able to maintain a diversified technical program, although it can maintain its existence without such outside funding if need be.

It charges relatively inexpensive fees for its services, which would otherwise be too expensive for its clientele or not available at all. It is apolitical and has demonstrated continuity in its organization and service delivery capability.

ICAITI, unlike several of the other regional institutions, has no parent organization and, therefore, is more at financial risk. To minimize this risk it needs to have a more active participation by its board, either directly or through the use of a technical committee upon whose recommendations the board may act. It also needs to assume increasing responsibility for its promotional activities in the member countries which AID has supported in the past and with which the institute has had very good results in terms of increased awareness of ICAITI and its services.

In our opinion ICAITI is a useful organization that offers unique services at economies of scale: i.e., each country does not have to create and maintain facilities for testing, standards setting, certification, etc. It provides a continuance of outreach - problem-solving - technologies introduction - technical support - demonstration activities that are beneficial to industrial development and technology dissemination in the region.

Its relations with external donors like AID are symbiotic, where institutional services are provided in support of agency objectives. ICAITI is not, however, the best vehicle for broad

scale implementation of applied technologies. Other organizations, such as PVOs can probably do this more efficiently and at a lower cost.

We recommend the continued use of ICAITI, where appropriate, by AID.

## INTRODUCTION

This report contains the results of an institutional assessment made of ICAITI over a two week period in November and early December 1983. The assessment was carried out by a combined Coopers & Lybrand-AID team. Our investigation centered primarily on assessing the capabilities of the institution itself, and the perceptions of the users of ICAITI such as representatives of the national governments in the region and members of private industry.

Our assessment was intended to provide information in the following areas: organizational; technical and financial. During this data gathering process we were also made aware of a number of important issues that influence ICAITI's organizational ability and its capacity to effect industrial development and the dissemination of technology in Central America. An awareness of this factual information and the issues surrounding industrial development has allowed us to form certain conclusions about ICAITI and industrial development in the region in general, and to reach the recommendations that conclude this report.

We sincerely appreciate the cooperation and support provided by the management of ICAITI, the ROCAP mission and all of the people who participated in our interviews throughout Central America.

## OBJECTIVES AND METHODOLOGY

The overall objective of this institutional assessment of ICAITI was to provide information concerning the role the institution can best play in industrial development and technology in Central America and Panama.

To do this, the assessment team carried out a series of interviews and background research with representatives of ICAITI, AID (ROCAP and bilateral mission personnel), and industrial decision makers and implementors in Honduras, Guatemala, and El Salvador. Limited time precluded visits to other countries in the region. Our questions were designed to provide information in the following areas:

- 1) What role has ICAITI played in development strategies in Central America and Panama?
- 2) What continued role is most appropriate for ICAITI given its existing and potential capacities?
- 3) How might AID most effectively use ICAITI in carrying out the agency's industrial development strategy for the region?

Our findings, conclusions and recommendations are contained in the report that follows.

## I. FINDINGS

Our analysis of ICAITI's present programs and organizational capabilities, and our interpretation of current AID policies, determined a match of ICAITI services and AID needs in the following areas:

- . food and agriculture
- . environment and natural resources
- . transfer of technology
- . industrial development
- . private sector development
- . energy
- . appropriate technology.

A match was suggested where an obvious overlap between AID objectives, as contained in the agency's policy statements, and ICAITI's technical capabilities and mandate existed. More specifically, the team made the following findings in the areas of ICAITI's organization, technical capabilities and financial condition.

### A. Organizational

ICAITI is organized along service area lines. These include technical and industrial services, standards, applied research, testing and materials analysis, and technical information. Other units exist for administration and finance, geological studies, science and technology development, and technical publications. Each of the technical divisions is described in greater detail in the technical part of this section.

ICAITI is headed by a director appointed by its board of directors. He is supported by a deputy director who also serves as department head of one of the major departments.

The ICAITI board of directors is composed of the ministers of economy from the five member countries: Guatemala, Honduras, El Salvador, Costa Rica and Nicaragua. The board of directors has not met officially for over six years making the organization, in

a de facto sense, very autonomous, with much of its direction and planning left to the director.

Our interviews with ICAITI's management indicated that in recent years (1980-1983) ICAITI has placed much of its non-scientific attention on improving the institution's financial control systems and overall project management. This was necessitated by a deteriorating financial condition in 1980 and, as a result, a strengthened commitment on the part of the institution's management to improving financial security has taken place. Furthermore, the institution has placed increasing emphasis on identifying and obtaining projects offered by bilateral and multi-lateral organizations such as A.I.D., the World Bank, the Inter-American Development Bank and various European development organizations. These types of projects have sustained, to a large degree, ICAITI's regional activities during the downturn that has occurred in the region's national economies.

ICAITI has continued to strengthen and build its management systems during this period, with much emphasis being placed on project control and financial accountability. Much of the institution's accounting system has been computerized since 1980, allowing more timely reporting of financial information. However, at this stage of systems development, the system is still fairly rigid in terms of its capacity for flexible reporting and data analysis. This suggests, in our opinion, the need for continued expansion of the institution's financial management and reporting systems capabilities.

ICAITI's planning, by necessity, is short range (i.e. one to two years). This is due to political and economic uncertainty in the region which heavily influences industrial investment, production and expansion. Also, because of the present emphasis on external donor projects, ICAITI's planning, to a large degree, does not extend beyond current projects due to uncertainties about future project .

## B. Technical

### 1. Mandate and Role

ICAITI was founded as a non-profit organization in 1955 to:

- . provide technical services to the region's industrial sector;
- . conduct research on products and processes using regional resources;
- . advise and provide information on industrial technology.

Its regional role includes:

- . setting standards for raw, intermediate and finished goods;
- . quality control analysis of products;
- . materials testing and certification;
- . cooperation with national governments, universities and technical organizations.

### 2. Program

ICAITI has eight technical divisions. The technical focus of the institute is primarily agro-industry and energy. The majority of the staff and activity are in three main divisions:

- . Technical and Industrial Services;
- . Applied Research;
- . Analysis and Testing.

Three other divisions are important but smaller:

- . Norms and Standards;

- . Documentation and Information;
- . Technical Publications.

The final two divisions are relatively inactive:

- . Applied Geology;
- . Scientific Policy.

Applied Research. This division is divided into six departments: microbiology; food chemistry and bioengineering; chemical and industrial engineering and agro-industries; analytical chemistry and biochemistry; food science and microbiology and chemical engineering in wood and fibers. This program began in 1970 and is loosely linked with laboratories throughout Latin America and the Caribbean. The primary focus for laboratory activities is post-harvest handling of crops and residues for feed, food or fuel.

This division's work is essentially to investigate and experiment on products and industrial processes indigenous to Central America. In recent years priority has been given to agro-industrial development emphasizing: the chemistry of local plant products; applied chemical engineering for processing these products; food technology; industrial microbiology; bioengineering and biomass technologies.

As some examples of the work of this division during 1982, the applied research group received funding from:

- . OAS - production of fungi and single celled proteins for human and animal consumption on agricultural residues such as coffee pulp and husks, wheat straw and rice hulls.
- . OAS and ICI (Spain) - paper and pulp technology evaluating regionally available raw materials (fibrous and non-fibrous) for paper production and studying economic processes for utilizing these materials.
- . IDRC - alternative approaches to coffee drying, studying different types and designs for more efficient equipment.

- . AID (ST/EY - USDA) - developed equipment for drying coffee pulp for use in combustion chambers for coffee-drying thereby replacing wood or diesel.
- . Mexico/Guatemala - biological control of coffee rust.
- . UNESCO - maintain a network of Central American and Caribbean microbiological laboratories and research. This network is being expanded to include all South America.
- . IFS (Sweden) - Studies of banana wastes for use as food or animal feed.
- . UN and IDB - development on EX-FERM process for ethanol production from sugar cane.
- . AID (Science Advisor) - industrialization of pectins from coffee mucilage.

In addition to the selected list above, the division performed research and technical assistance for a number of private and public entities in the region, ranging from studies on nitrogen-fixation of black beans to biological control mechanisms for blue mold on tobacco, to helping present a training course on non-traditional technologies for alcohol fermentation.

Scientists in this group publish extensively and their findings are well received in the international scientific community based on the interviews we conducted.

Technical and Industrial Services. Marketing, technical and economic feasibility studies, cost control, process expansion, raw material availability, productivity, and other economic and industrial engineering activities are conducted by this division. The division manages both the fuelwood and energy efficiency projects funded by ROCAP.

Examples of the type of work performed by this division during 1982 include:

- . market study for the pharmaceutical industry on the prospects for investment in Nicaragua (FINAPRI);

- . pre-engineering for projects on sodium bicarbonate, sodium sulfate and hydrogen peroxide manufacturing (CABEI);
- . appropriate technologies for improving rural housing (Ministry of Public Health and Social Assistance);
- . technical and economic feasibility studies for electric iron manufacture;
- . technical and economic feasibility of silverware manufacture including market analysis in Central America;
- . preliminary design of a plant for steel piping;
- . manual water pump manufacturing feasibility work for Georgia Tech (WASH).

This division has also been managing quite successfully the ROCAP financed project on wood stoves and renewable energy resources. Woodstove, biogas, brick kiln, bread kiln, solar dryer and solar heater prototypes have been widely demonstrated throughout the region. These demonstration units are being replicated by a number of national counterpart entities throughout the region with the technical and training support of ICAITI.

Analysis and Testing. A variety of work in food, textiles, leather, rubber, petroleum products, paper and cartons, synthetic industrial resins, construction materials, use and control of insecticides and pesticides and environmental contamination tests are carried out by this division. The laboratory, which performs quality control and certification testing, receives a large percentage of the long term contracts held by ICAITI.

This division's objective, to evaluate and improve the characteristics of raw materials and intermediate and final products, is complemented by extensive laboratory facilities which include:

- |                       |                           |
|-----------------------|---------------------------|
| . organic chemistry   | . textiles                |
| . inorganic chemistry | . food technology         |
| . leather technology  | . industrial microbiology |

- . rubber technology
- . special analysis.
- . pulp and paper

The division services the region with tests and measures of the characteristics of its industrial products. Together with the Standard's Division, this group determines acceptable definitions of product quality. Many of the products analyzed come from processes that are not of Central American origin such as: fertilizers; petrochemicals; synthetic resins; and pesticides.

Beyond the purely analytical aspects, this division also functions as a provider of technical assistance and training to industries or laboratories in their processing or testing.

During 1982 the laboratory analyzed more than 1500 samples of products ranging from mayonnaise, flour and canned goods to lubricants, hydrocarbons and drugs, soaps, oils and detergents.

Norms and Standards. ICAITI has developed regionwide standards for a variety of manufactured industrial products. It also acts as a reference laboratory to help maintain standards for a variety of exports which have to meet foreign standards. Thousands of standards for product specification have been developed for the region.

As industrial products and inter-regional trade in the region grew, the necessity for standards of quality for products increased. This division is assisting the national committees for product Standards to not only define standards for an extensive array of products, but also has given technical courses on control and measures for product quality.

Applied Geology. This division assists and advises on ecological resources and potential for mineral exploitation in the region.

Scientific Policy. This division conducts applied studies and special training programs using resources of other divisions in applied science and technology.

Documentation and Information. Information storage, research and retrieval are provided by this division using ICAITI's own library and a variety of other information resources. The information is computerized and can link to U.S. and European data bases by telephone.

This division, besides providing the best technical library facilities in Central America, can also conduct interactive computer searches for clients using information bases such as DIALOG or ORBIT. Approximately 50% of the requests for information services came from the private sector, predominately in Guatemala. The interactive requirements of data searches limit their utility to users outside Guatemala.

A major preoccupation for this division is its efforts to obtain sufficient funds to buy books and other documents in order to keep its facilities relatively up to date.

Technical Publications. This division publishes popular, technical and research studies for the general public, industrial sectors and specific industries or other clients. This office is also responsible for expanding the public relations and promotional activities of ICAITI.

This division annually prints a major catalog of ICAITI publications. With a growing need for ICAITI to increase its promotional activities, it will be necessary that more attention and support be given to this group. ICAITI's printed materials are of high quality, both in technical substance and format. There is, however, need for increased availability and dissemination for ICAITI's useful work.

### 3. Training Activities

ICAITI conducts a wide range of training activities for a variety of institutions. Under ROCAP funded projects, ICAITI is training recipient institutions in technologies ranging from woodstove and bio-digester construction and operation to conducting energy audits and performing industrial retrofits.

ICAITI also prepares and presents courses on thread and textile production, rubber processing, leather testing, quality control or analysis of virtually any product, setting up customs laboratories, managing information systems, conducting microbiological analysis and planning and preparation for small industrial enterprises.

All of ICAITI's courses are short-term. Occasional internships of recent university graduates provide a type of training along with ICAITI funded grants to university students to help defray the cost of thesis research that ICAITI judges as valuable to the region.

Because of the highly skilled and qualified nature of ICAITI's professionals, it is likely that their assistance will have increasing application to bilateral and national development programs. ROCAP projects with ICAITI have promoted increased outreach and projection by ICAITI technicians. A continued emphasis on improving ICAITI training and extension capabilities should be considered in future ROCAP funding.

#### 4. Technical Assistance Services

ICAITI provides technical assistance to the public and private sectors in the Central American region. Clients are able to acquire on a fee basis ICAITI's technical services, either through the in-country representative or directly at ICAITI's headquarters in Guatemala. The requests cover the full range of services offered by ICAITI, and in cases where the institution lacks the necessary skills or equipment, it identifies for the requestor the appropriate resources in the U.S. or Europe and then acts as a conduit for obtaining the services. Many industrial users in the member countries expressed concern that if ICAITI did not exist these services would not be attainable due to high costs or lack of availability. Details of the kinds of service supplied are outlined under the discussion of programs.

A high degree of satisfaction with ICAITI's performance and services was expressed by all users: national counterparts;

national government ministries; the regional integrated industries; private industries; private voluntary organizations; international donors and USAID missions. The reputation of ICAITI with these users is one of quality and competence.

#### 5. Technical Services

Across the board ICAITI's technical services were perceived by users to be very good to excellent. For quality control testing or product analysis, ICAITI's results are considered by users in the private sector to be as reliable as those of U.S. laboratories offering comparable services. In establishing standards, the ICAITI certification is deemed prestigious by manufacturers and national governments. For food, chemical, leather, textile, rubber, paper and construction materials testing, ICAITI laboratories and personnel are generally as qualified as any in the region based on our assessment of their facilities and capabilities. ICAITI's technical reference resources and information network are more complete than any in the region. Technical publications are of scientific quality and the library and information service is the best in its field for the region.

#### 6. Research

Much of ICAITI's research into water purification, food processing, food packaging, food storage, construction materials, agricultural waste disposal and utilization, and new products has been adopted, to varying degrees, by local industries. All governments accept ICAITI standards as the benchmark for the region.

ROCAP has been satisfied with ICAITI's progress in conducting adaptive research on woodstoves, biodigestors, solar hot water panels, solar dryers and small wood-fired kilns for industry. These ROCAP financed activities are just reaching the point where technology demonstration and ICAITI conducted training seminars

are beginning to lead to significant national and local initiative's for subsequent replication.

### 7. Training

Since ICAITI training is entirely short-term, and predominately in response to requests from clients, there is not much formal structure to the program. The short courses and seminars conducted by ICAITI are perceived by the national governments as very useful introductions to new technologies. These training efforts also dramatically increase ICAITI's exposure and have led to numerous follow up requests for ICAITI services.

### 8. Program Relevance

In general, ICAITI's programs and activities are considered by the public and private sector users interviewed as relevant; if not in the near term then for the longer term.

National institutions and the private-sector recognize the importance and necessity of ICAITI. Though both are currently limited in their ability to be significant purchasers of ICAITI services, both believe that ICAITI-type capabilities will be essential to the region once industrial development and growth resume in Central America.

## C. Financial

### 1. Analysis of Revenues

ICAITI's revenues are generated by annual member government quotas, contractual services, donations and small amounts from sources such as interest income and pension fund adjustments which are combined as "other revenues". In 1982\* the institution's revenues were as follows (in thousands of U.S. dollars):

---

\* 1982 is the most recent year for which complete data was available.

Member contributions	\$ 232	10%
Contractual services	1,289	58%
Donations	487	22%
Other revenues	<u>216</u>	<u>10%</u>
Total revenues	\$2,225	100%

Basic funds (member contributions and other revenue) have been stable during the 1980-1982 period and in the range of \$435,000 to \$470,000.

Contractual service revenues in 1982 and 1983 (including projected revenues for November and December 1983) were \$1,289,000 and \$1,850,000 respectively. It appears that contract revenues have declined from prior years, however, a change in the accounting method at the beginning of 1982 makes a direct comparison with prior years difficult. (Prior to 1982 revenues were recognized upon completion of a contract rather than as expenditures occurred through the contract period as at present.)

AID was the largest single source of ICAITI funds during the first ten months of 1983, contributing 52% of contractual service revenues. None of the other contractors (24 plus numerous users of laboratory analysis services) individually represented more than 12% of contract revenues.

	<u>% of Contract Revenues</u>	<u>% of Total Revenues</u>
AID	52%	30%
CORFINA (National Finance Company, Guatemala)	12%	7%
OAS	8%	5%
Other institutions	23%	13%
Multiple users	<u>5%</u>	<u>3%</u>
	100%	58%

Basic member government quotas are \$80,000 from Guatemala, and \$75,000 from the other four countries, for a potential annual contribution of \$380,000. In addition, in 1979 the board of

directors approved a scheme by which ICAITI could be provided an additional annual payment from the member countries, which is a deposit toward services the member government expected to use during that year. Through November 1983, only Guatemala was current in both types of payments. Honduras was current in basic quotas except for a small disputed amount from the 1970's. Nicaragua made a payment in excess of its annual quota, reducing the amount it remains in arrears. Only El Salvador made no payment during 1983 or 1982.

## 2. Analysis of Costs

ICAITI's expenses fall into the following major categories. During 1982 they were distributed as shown:

<u>NON- EXPENSES</u>	<u>NON- CONTRACT*</u>	<u>CONTRACTUAL SERVICES</u>	<u>TOTAL</u>
Personnel	\$632	\$620	\$1,252
Operating expenses	206		204
Materials & supplies	45	85	130
Other direct contract costs		197	197
Indirect costs allocated to contracts (Overhead)	(484)	484	
Depreciation of donated equipment	272		272
Other-net	151		151
Total expenses	<u>\$ 821</u>	<u>\$1,386</u>	<u>\$2,207</u>
Net of Revenues, Income (Loss)	\$ 116	\$ (97)	\$ 17

Note: Addition differences are due to rounding.

Direct contract costs are primarily personnel-related. This category includes the salaries and benefits of permanent and temporary personnel directly involved in contract work. The category of "other costs" includes items such as travel and

---

\* Member contributions, donations and other revenues such as interest income and pension fund adjustments.

equipment purchased which are directly attributable to a contract. Indirect project cost is the portion of administrative expense allocated to contractual services or "overhead."

Personnel is also the largest expense category for non-contractual activities. It includes administrative staff, management and the portion of technical staff time which is not charged to contracts. Also included are some temporary personnel, external auditors and consultants. Of ICAITI's total personnel expense, about half was related to noncontractual activities in 1982.

Operating expenses at ICAITI include such items as communications, utilities, building maintenance and vehicle expense.

Approximately 62% of total expenses was related to contractual services during 1982, including both direct and indirect expenses.

### 3. Cash Flow Projections

A summary of projected revenues and expenses for the years 1983-1988 follows. These were prepared by ICAITI management on a cash basis in thousands of U.S. dollars.

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
<u>REVENUES</u>						
Members	\$ 315	\$ 325	\$ 250	\$ 250	\$ 300	\$ 325
Contract Services	1,850	2,100	2,200	2,300	2,350	2,400
Other	<u>110</u>	<u>175</u>	<u>150</u>	<u>150</u>	<u>150</u>	<u>175</u>
TOTAL	\$2,275	\$2,600	\$2,600	\$2,700	\$2,800	\$2,900
<u>EXPENSES</u>						
Personnel (Contract related)	\$1,000	\$1,100	\$1,200	\$1,290	\$1,350	\$1,400
Materials & supplies	150	180	200	210	220	230
Other direct	283	350	360	370	380	390
Indirect and non- contract costs	700	725	740	750	760	770
Other costs	<u>112</u>	<u>200</u>	<u>50</u>	<u>30</u>	<u>40</u>	<u>50</u>
TOTAL	\$2,245	\$2,555	\$2,550	\$2,650	\$2,750	\$2,840
Surplus	\$ 30	\$ 45	\$ 50	\$ 50	\$ 50	\$ 60

These projections show an anticipated increase in contract service revenues of 12% in 1984, based primarily on continuing projects and known new projects. In succeeding years modest increases of 2% to 4% are projected for contract services. Management expects regional and international organizations to be the principal source of this growth. Contracts with the regional public and private sectors are expected to remain stable.

Member government quotas are not expected to be increased by the board of directors. The amounts shown are the amounts expected to be collected, not the total quota commitment.

Direct personnel will continue to be the major expense for contract services, representing 43% to 48% of total expenses.

Costs not directly related to contract services are projected as follow for 1983:

Personnel	\$483	69%
Materials & supplies	42	6%
Operating costs	91	13%
Depreciation	49	7%
Other	<u>35</u>	<u>5%</u>
	\$700	100%

After 1983 the personnel proportion of these costs is expected to decrease slowly as salaries and staffing level remain fairly constant while total expenses increase. The materials and supplies and operating costs categories are projected to increase proportionately.

#### 4. Indirect Costs and Contractual Services

##### Methodology

Indirect costs, or overhead, are allocated to contractual services as a percentage of a contract's direct personnel expense. Currently this is a multiplier of 80%. This rate was determined using the following costs:

- . Personnel cost of management and administration;
- . Operating costs of the institution;
- . Materials and supplies not related to contracts;
- . Personnel cost of technical staff not related to contracts.

It was found that the overhead cost not covered by member quotas equalled 80% of contracts' direct personnel expense.

Actual 1982 Calculation

An overhead multiplier is recalculated at the beginning of each year using the actual costs experienced in the prior years. We were told by ICAITI's management that overhead expenses for 1982 were as follows:

Total Overhead:	149%	of direct contract personnel costs
Quota Contributions:	<u>-39%</u>	
Balance remaining to be collected through projects	110%	

Though the 1982 calculation shows a potential overhead rate of 110% to be applied to contracts, the rate actually charged to contractors was 80%. Therefore, for the period, ICAITI absorbed through funds other than recovered overhead the 30% difference. This decision was made due to a perceived sensitivity on the part of ICAITI's management to increases in the overhead rate by donors.

5. Accounting Procedures

Beginning in 1982 the method of reporting contract revenues and expenses was changed. Actual costs and billings for the current year are reported as they occur. This differs from the previous system of reporting, when all accrued costs and revenues of a project were reported only at the completion of the contract. The new method gives a more accurate picture of contract service activities during each year.

A separate accounting is maintained of the direct expendi-

2.4

tures associated with each contract. As personnel expense is recognized, the allocation for indirect costs is also recognized. Contract managers receive monthly accounting reports including expenses for the month and for the year-to-date, the budget for the year, variance of actual expenses from the budget, and amounts billed.

During the past three years improvements have been made in ICAITI's accounting system. Generally data from the system appears to be reliable. However, there is room for improvement in the system, particularly in the way management information is collected and used beyond the normal accounting reports. The system does not allow ready access to financial data in any manner other than the internal accounting format.

#### 6. Cost Control

Costs of contractual services exceed budgets (and revenue) in some cases. This can be seen on page I-13 in the net loss figure shown for 1982 for contractual services. This is attributed to the underestimation of costs at the time contracts are prepared, and to the more technical (and non-financial) outlook of some contract managers leading to inattention to cost control. In addition, some services which generate small revenues from many users, such as laboratory analysis, charge only the cost of materials, supplies and personnel time. The users are generally private enterprises. ICAITI's management is aware of this and is continuing to correct the situation.

Presently, the shortfall in contractual revenues, as compared with expenses, is paid for through other income such as member contributions.

If this situation continues, in the long-run ICAITI will have less funds available for such necessary activities as the replacement of facilities overtime or expansion. ICAITI would be a financially healthier institution if project and laboratory service costs were more closely controlled, and if users were charged the full cost of their activities. In addition, this

would reduce the amount which must be collected through overhead charges.

## 7 Financial Viability

AID's contracts with ICAITI have made an important contribution to the institution's revenues and activities during the 1980-1983 period, particularly in light of the region's economic difficulties. AID's contracts have provided a counter balance to the decline in contracts from within the region.

Without an annual contribution from a parent organization, as some institutions in the region receive, ICAITI is more susceptible to financial instability caused by changes in the regional economy and in donor activities.

In order to assess financial viability, a hypothetical "worst case" scenario could be postulated where zero funding by AID would take place with no compensating increase by other contractors. Under these circumstances, both ICAITI's administrative and technical personnel would be greatly reduced. However, operations could continue. Technical activity would be primarily in the Applied Research, Norms and Standards, and Technical Industries Services Division. In this circumstance the institution's contribution to the region would be substantially less than at present. However, the institution could continue to operate.

## II. ISSUES

During the course of the team's investigation a number of issues were put forward by the people we were interviewing or become apparent based on information obtained from other sources. We present these issues in this section to enable the reader to better understand ICAITI and the environment in which it operates.

### 1. ICAITI and Central American Industrial and Economic Development

ICAITI was specifically created by countries in the region to support industrial development and applied technology in Central America. ICAITI's institutional well-being is dependent on the state of that economy. Economic vitality is, however, heavily influenced by political conditions. Therefore, ICAITI, to a large degree, is greatly influenced by external conditions beyond its control.

### 2. Comparative Advantages

ICAITI, being a laboratory and scientific institution, has numerous advantages over similar facilities located outside the region. ICAITI's mandate and orientation towards providing testing, analysis, information and specialized assistance to Central American governments and industries gives it a unique mix of services to offer in Central America.

As a regional entity ICAITI has developed a sufficiently large and competent staff of skilled personnel and modern laboratories to create a "critical mass" of expertise that provides for reasonable economies of scale. In addition, as a public servant, ICAITI offers its services at costs significantly below the price of similar assistance offered from outside the region.

ICAITI has a strong reputation among familiar clientele and is respected for the quality of its services and for its guarantee of confidentiality when required. Because of familiarity

with the language, culture and politics of the region, ICAITI offers specialized training and information more successfully than others can who are not as familiar with local conditions. ICAITI also provides a link between local institutions that otherwise would have difficulty working together due to rivalries or political conditions.

Since ICAITI is involved in many aspects of the production cycle - from feasibility, to design, to testing raw materials, to process and quality control - it is able to offer a wide range of competent services. Additionally, ICAITI has good credibility internationally and is actively involved in a network of renowned technical institutions worldwide.

While ICAITI does not perform basic research and development tasks, it is responsive to regional needs through adapting applied research to local requirements.

Perhaps its two greatest drawbacks, based on our observations, are that the further one gets from Guatemala the less ICAITI's services are used and, concomitantly, that ICAITI's experience in extension and promotion of its unique skills and capabilities have only relatively recently been developed. ICAITI's field representatives in four of the member countries are beginning to make inroads into both of these areas, although more support from headquarters and additional staff may be required to maintain the momentum.

### 3. Training and Extension

Although training has long been an integral part of ICAITI's program it has usually been conducted on a relatively ad hoc basis. There is no division or office that coordinates training activities; rather training materials and courses are prepared by those divisions from whom it is requested.

By giving training activities greater emphasis, the visibility of ICAITI in the region would be greatly enhanced. Training should serve as a constructive vehicle for a wider dissemination

of ICAITI's knowledge, technology and publications. By augmenting the amount of training given, ICAITI will continue to improve its image as a provider of necessary industrial services and receive increased feedback on what the most immediate technical needs in the region are.

The question of ICAITI's role in the extension process is part of this same training issue. ICAITI's highly skilled but limited staff cannot be involved directly in the massive replication of the technologies they have adapted and designed for use in the region. ICAITI cannot be the implementor of national programs for the production and distribution of, say, water filters, solar collectors, water pumps or coffee pulp dryers because its staff is small and, from a cost effective point of view, other organizations, like PVO's, are less expensive. ICAITI can realistically only continue to encourage a better understanding of the beneficial role these technologies can have in the development of the region, and provide training and technical assistance to local entities that will assume the responsibility for broader promotion. ICAITI's role should continue to be one of stimulating awareness, testing, demonstrating, training and advising, while national groups must do the extension work in transferring and replicating technology on a massive scale.

The bilateral USAID's in the region should be better advised of ICAITI's skills in order that bilateral projects can begin to finance the reproduction of some of the cost-effective innovations ICAITI has achieved in recent years. ICAITI counterparts in El Salvador, Honduras and Guatemala unanimously expressed interest in utilizing the technical skills and experience of ICAITI to support their efforts in "massive diffusion" programs. It is important that the AID missions be aware of the potential, particularly as enthusiasm grows on a national level for new technology which goes beyond the ability of either ICAITI or the national governments to finance.

#### 4. Specialization

ICAITI's current focus is on energy and food technology. Both areas vary broadly in terms of their technical content and industrial needs. It will not be possible, or desirable, for ICAITI to attempt to meet all the needs for testing and technical support that conceivably could arise in these two areas. Therefore, ICAITI will best augment its own capabilities by identifying and forwarding requests to appropriate facilities in the U.S. and Europe when very specialized services are required.

ICAITI's organization is developed around functional lines, not technical areas. This is rational considering the range of its clients.

An increased orientation toward the private sector in light of the Caribbean Basin Initiative (CBI), especially for non-traditional products-processing technology, materials testing, packaging, storage, acceptance testing and energy conservation and substitution, are likely to become increasingly appropriate.

Also when Central America's industries revive, national governments will seek increased ICAITI assistance for standards and quality control.

#### 5. Promotion

ICAITI's promotional activities have been directed principally to the public sector. The private sector, especially at the medium and small scale enterprise level, is more diversified and diffused and, therefore, more difficult to focus promotional activities on.

AID, to a large degree, is responsible for ICAITI's ongoing promotional activities, e.g. country representatives, seminars, brochures and technical bulletins. ICAITI will need to build the institutional capacity necessary to sustain its own promotional activities at some point in the future.

## 6. Linkages with National and International Organizations

ICAITI's linkages with national institutions are based on its project connections. Many of these projects are donor financed. Its linkages with donors are strong.

ICAITI's university linkages are informal. It also maintains an informal network with other laboratories based on training, field work and informal seminars.

ICAITI is underutilized by Central American governments and the private sector because of a lack of money, a decline in industrial activity and a lack of knowledge on the part of potential users of ICAITI's abilities and activities. The Guatemala location of the institute is also a factor contributing to underutilization. However, this would be a problem no matter in which country the institute were to be located and is best overcome by active, in-country representatives.

## 7. Role of Donors

External donors are the principal source of ICAITI's program funding, AID by far is the greatest contributor. Donors have the ability to heavily influence the organization's priorities by virtue of their funding activities. ICAITI is financially dependent on external donors to sustain larger scale program activities, especially when other potential sources in the region, e.g. national governments and private industrialists, have fewer means to sponsor such activities or purchase services because of depressed economic conditions.

ICAITI is, for the external donor, a willing, able and responsive vehicle for carrying out donor programs. The relationship is symbiotic as long as neither the institution or the donor have seriously distorted their program needs or institutional capabilities in order to accommodate one another. There is no reason to believe that this has been the case to date.

Donors contribute heavily to ICAITI's overhead activities during an economic downturn due to decreased demand on the part of other clients, and relatively fixed central staff and facilities expense.

#### 8. Country Contributions

Four of the five contributing countries are in financial arrears to some degree. This reflects a combination of three factors: 1) an inability to pay due to competing demands for governmental funds in a period of general economic depression; 2) political instabilities in the region; and 3) a general lack of emphasis on industry.

This raises a question, in terms of our assessment, as to whether outside donors should consider general institutional assistance to a regional organization if the member countries themselves do not provide at least comparable support? Support can be nonfinancial such as more active involvement in ICAITI by its board of directors. This is relevant to AID's case in such activities as funding for promotion or expansion of ICAITI facilities.

#### 9. Continuity and Growth

External projects provide the financial means for ICAITI to continue to carry on a moderate level of project activities in the Central American region during periods of economic slowdown. AID is the chief provider of project funding. This situation is likely to continue until the economy in Central America improves greatly.

ICAITI's independent growth is based on industrial wellbeing and technological development in the region. Sustained growth in the future will have implications for ICAITI's size, services and mix of specializations.

ICAITI's institutional capabilities can be increased through additional country contributions, increased prices or the increased sale of services. However, these options can be more realistically considered when the economic situation in the region improves and national governments and private industrialists are more willing to seek ICAITI's services and to pay higher prices for them.

### III. CONCLUSIONS AND RECOMMENDATIONS

During our interviews with the management and staff of ICAITI and various users of the institution's services in both the public and private sector in Central America, the assessment team formed a number of conclusions concerning ICAITI and the role it plays in industrial development in the region. These conclusions provide the basis for the recommendations that are underlined below.

Our assessment of ICAITI has led us to the conclusion that the institution is both a unique and useful technical resource in the Central American region. No other regional or national facility can provide the services that ICAITI now provides. No other institution has the established creditability of ICAITI in terms of widespread acceptance of its technical analysis results and standards setting work. Along with this, ICAITI is building an outreach capability that takes its industrial problem solving services to the customer, introduces new technical concepts and supports demonstration projects for applied technology. We came away with a very favorable impression of the institution's performance and capabilities based upon a number of interviews with users in Guatemala, El Salvador and Honduras, representing both the public and private sectors.

ICAITI has a comparative advantage in the region in the price of its services, training, and in its capacity for technology transfer. No other organization in Central America can offer the general industrial support that ICAITI now provides. While comparable services may be obtained in North America and Europe, their costs, based on customer comments, often exceed those charged by ICAITI by a large percentage.

ICAITI has the ability to tailor technology training to the needs of users in Latin America. It has the language facility, is attuned to local customs and norms, and is far less expensive than other sources of training that might be obtained outside the region. Training at ICAITI has traditionally been a departmental

function. As training needs have been identified or "projectized", the programs have been designed and carried out by the individual departments. However, as the training programs of the institute grow in importance and complexity, it may be to ICAITI's advantage to consider creating a training coordinating office to: 1) identify training projects; 2) assign them to individual departments or, where more complex, assign across departmental lines; 3) assist in pricing these contracts in keeping with ICAITI's pricing objective; 4) maintain audio and visual equipment; 5) monitor training provided and adherence to budgets; and 6) evaluate results and customer satisfaction. Such an office would serve principally in a coordinating role reporting to the deputy director. The need for such an office, of course, should be based on an assumption of continuing or growing demand for ICAITI training services that are complex enough to routinely cut across departmental lines. This recommendation also recognizes the fact that training techniques and performance can be strengthened by using training professionals to augment the technical skills of the institute's departmental scientific staff.

ICAITI's role in technology transfer should be kept in a proper perspective. The institute should be discouraged from expanding its role into the larger scale dissemination of technologies. ICAITI should focus on providing quality support and assistance to groups at the national level responsible for the extension and diffusion of new technology. ICAITI should not attempt to compete with these groups but rather complement and assist their efforts where appropriate. Such groups may include technical units in national ministries, business associations, PVOs and cooperatives and private industry organizations.

In a related area, ICAITI should give more attention to preparing comprehensive technical data on technologies it is promoting. To date, the published evaluations of wood stoves, biogas digestors, coffee pulp drying techniques and other ICAITI

tested technologies have been insufficient to verify their economic justification based on cost effectiveness. ICAITI should place more emphasis on reporting what it has learned about the successes and failures it has experienced with its applied technologies.

In looking at the performance and contribution of the organization, it must be understood that ICAITI is, to a great extent, dependent on the state of industrial vigor in Central America for much of its support and self reliance outside of donor funded projects. This has not been easy in a region where other sectoral priorities tend to take precedence over industrial development, and especially in recent years when the region has been in economic turmoil.

Because of this dependence and the diminishing economic conditions of the region, ICAITI has turned increasingly to the multi-lateral or bilateral assistance community of which AID is a part. ICAITI projects are now being funded by AID, the Canadian government, the German government and regional organizations like the Organization of American States. AID is the largest funder; ROCAP is AID's principal funder of ICAITI projects. This is to be expected due to the regional mandate of the two organizations, although several missions at the national level, as well as centrally-funded (Washington) projects have been undertaken by ICAITI.

ICAITI has potentially a greater financial risk than that of several of the other regional organizations. Those organizations, such as CATIE in Costa Rica and INCAP in Guatemala, have "parent" organizations from which they can derive financial, administrative and technical support. ICAITI does not and, therefore, must either curtail its range of services or seek out donor projects to maintain its existence during periods of regional financial difficulty. This situation increases the importance of careful cost estimating when contracts are accepted, and of strong cost control during the life of contracts.

In actuality, it becomes a rather symbiotic relationship between ICAITI and users of its services, if certain conditions are maintained. The donors have access to an organization with sufficient technical proficiency to carry out projects that a donor does not have adequate technical resources to carry out itself, and ICAITI is aided in maintaining its technical resources which could be jeopardized by the loss of revenues from the industrial sector.

With a heavier involvement on the part of donors there are also inherent risks. For example, ICAITI finds its technical programs increasingly influenced by the technical needs of donor's projects. This is especially true for larger projects that continue over several years. A potential consequence that both donor and institute must be aware of is that the institute may build or emphasize a technical area and then find that, as the donor's priority changes, there is little additional demand in the region. Also, donor projects tend to narrow ICAITI's perceived fields of technical specialization. AID, for example, has heavily influenced ICAITI's entrance into the field of energy. In the main this may have positive results. However, ICAITI should resist overextending into fields with limited application in the region where such an extension has the potential for profoundly affecting its resources and capacities.

Based on what we have learned about ICAITI we would recommend that AID continue to use ICAITI as a resource for achieving its industrial development and applied technology objectives in Central America. We believe ICAITI has particularly strong credentials in the areas of: industrial renovation and development; increased food supply and exports; the dissemination of industrial skills and technology; and energy conservation. As such, ICAITI is a willing, able and responsive resource available to AID. However, neither organization should stretch its project content or technical capacities simply to accommodate one another. The selection by both parties should be based on existing program requirements and institutional capabilities.

Before leaving the AID/ICAITI project relationship, it should be mentioned that AID (ROCAP), through its technology transfer project with ICAITI, has been instrumental in building an ICAITI outreach and promotion capability in most of the Central American countries. The results to date have been very positive. However, ICAITI should now be planning a strategy for institutionalizing its field structure independent of AID project financing. This, primarily, has financial implications for the organization and several schemes for financing these and other indirect expenses will be discussed later in this section.

The role of the ICAITI field representative is changing. Initially, field representatives were primarily concerned with making potential public and private sector clients aware of ICAITI and its capabilities. To this end they have been successful. In fact, in visits to two countries, Honduras and El Salvador, it appeared that the field staff may be becoming over extended. As the ICAITI representatives have succeeded in developing projects they have also had to assume, in many cases, the management of those projects, thus increasingly taking time away from their promotional activities. Serious consideration should be given to increasing the size and changing the content of ICAITI's field staff so that promotional and technical management responsibilities can both be given proper attention.

Increasing the size of ICAITI's field staff could also prove cost effective, as it would reduce the travel time and expense of headquarter's staff, who now must travel to the countries to make up for those functions that the field staff, due to increasing demands on their time, are not able to perform. Having more field staff could, conceivably, increase the degree of continuity and confidence between ICAITI and the national entities it serves.

ICAITI could also benefit from greater exposure to the AID bilateral missions in the member countries which have national industrial development objectives. ROCAP, with its experience with the institution, should play a role in this process,

possibly through its private sector initiatives officer and his counterparts in the Central American missions. As a resource in the region, it is to the missions' advantage to be informed about ICAITI's capabilities so that they may be able to make informed decisions concerning the institution's potential for contribution to their bilateral programs.

ICAITI has the potential to make an increasing contribution to the private sector, especially if the positive implications of the CBI materialize for the Central American region. With this ICAITI will need to recognize the increasing needs of small and medium size industries. This will mean redirecting its promotional activities to some extent, and thinking in terms of technology applicable to and in demand by the smaller scale, private sector client.

Our assessment indicates the lack of participation on the part of member countries in ICAITI's planning, management and organizational performance evaluation. While this provides the organization with a great deal of autonomy, it also places a heavy burden on the management of the institution and narrows its planning perspectives. It also raises concern on the part of the external donors, who might be interested in the institutional strengthening of ICAITI, as to how much effort they should commit to an organization that, outwardly, is receiving minimal support from the countries for which it was created to support.

Much of the lack of direct participation may be attributed to the composition of ICAITI's board of directors made up of the Central American ministers of economy. There are inherent problems with such a board composition. Ministers of economy have many conflicting demands for their time and, being political appointments, are subject to frequent change. Also, their backgrounds often do not prepare them for evaluating the technical issues that are the basis of ICAITI's operations.

It is recommended that the member countries consider reconstituting the ICAITI board of directors to include members of national governments directly involved with technological pro-

grams as well as other scientific institutes in the region and representatives of private industry. If adopted this would provide a board with applicable but diverse points of view more able and willing to directly participate in ICAITI's planning and strategic decisionmaking. It would also be a way of expressing a regional commitment without increasing demands on the member countries for additional funding. If this is not possible, ICAITI may want to consider creating a technical committee upon whose recommendations the board could act.

In our financial analysis we found that ICAITI had implemented some changes in its basic accounting and financial control and reporting systems. Our point of comparison was 1980 when Coopers & Lybrand performed a review of those systems in conjunction with ROCAP's fuelwood project. However, while ICAITI can now more successfully capture basic accounting and financial information, this information needs to be used more effectively in controlling project expenditures so as not to exceed budgets. A stronger financial orientation must be instilled in project managers to ensure that cost overruns are minimized, or in justifying additional project funding from donors.

In addition, there is still a need to build more management information capabilities into the system. Formats are relatively rigid allowing little flexibility for extracting information beyond that produced by ICAITI's basic accounting format. Such information would be useful to management in more effectively directing ICAITI's activities. This situation is not unusual in an evolving accounting system, but points out the need for continuing growth and expansion of ICAITI's financial systems capabilities.

Presently ICAITI charges external donors for a portion of its administrative and operating costs which is not covered by member government quotas. These costs include such items as management and administrative personnel expense, cost of utilities, depreciation of facilities and equipment and miscellaneous materials and supplies consumed. The methodology used in

calculating and allocating overhead is clear and appears to be appropriate. ICAITI needs only be able to demonstrate that the cost figures that are employed by the overhead calculation are accurate and complete. Our limited analysis suggests that ICAITI may be understating the appropriate project overhead charges due to a concern about donor's reactions to increased costs. Donors should be aware that ICAITI's overhead charge may be proportionally larger than that of other regional institutions, due to its status as an independent organization with no financial assistance from a parent organization.

Finally, it was mentioned earlier that such activities as promotion may require sources of funding presently not available to ICAITI. We recommend that the institution consider charging a fee in addition to costs associated with external projects. This fee need not be an excessive amount. It could be used, if for nothing else, as a way of smoothing cash flow peaks and valleys.

BRIEFING  
INSTITUTIONAL ASSESSMENT  
THE CENTRAL AMERICAN INSTITUTE FOR INVESTIGATION  
AND INDUSTRIAL TECHNOLOGY  
ICAITI

COOPERS & LYBRAND  
FEBRUARY 10, 1984

df

## OBJECTIVES OF ASSESSMENT

1. TO DETERMINE WHAT ROLE ICAITI HAS PLAYED IN DEVELOPMENT STRATEGIES IN CENTRAL AMERICA AND PANAMA.
2. TO ADDRESS WHAT CONTINUED ROLE IS MOST APPROPRIATE FOR ICAITI GIVEN ITS EXISTING AND POTENTIAL CAPABILITIES.
3. TO SUGGEST HOW AID MIGHT MOST EFFECTIVELY USE ICAITI IN CARRYING OUT THE AGENCY'S INDUSTRIAL DEVELOPMENT STRATEGY FOR THE REGION.

## CONSULTANTS' ASSESSMENT

- o ICAITI ACTIVELY SUPPORTING INDUSTRIAL DEVELOPMENT IN CENTRAL AMERICA
- o INSTITUTE CARRIES OUT APPLIED RESEARCH, TRAINING AND TECHNICAL ASSISTANCE
- o OFFERS A CONTINUANCE OF OUTREACH-PROBLEM SOLVING-TECHNOLOGIES INTRODUCTION-TECHNICAL SUPPORT-DEMONSTRATION ACTIVITIES
- o TRAINING ACTIVITIES SHORT TERM AND TAILORED TO CLIENT NEEDS
- o PRIMARILY IDENTIFIED WITH AGRO-INDUSTRY AND ENERGY
- o FOR THE FUTURE, INCREASING EMPHASIS ON SMALL AND MEDIUM SCALE COMPANIES
- o PROJECT IMPLEMENTOR FOR AID PROJECTS
- o SERVICES PERCEIVED BY GOVERNMENT AND PRIVATE INDUSTRY AS OF HIGH QUALITY; CERTIFICATION WIDELY ACCEPTED
- o HEAVILY INFLUENCED BY ECONOMIES OF THE REGION
- o NO FINANCIAL BACKING FROM A "PARENT" ORGANIZATION
- o MORE ACTIVE PARTICIPATION REQUIRED FROM BOARD MEMBERS
- o NEED FOR LONGER RANGE, INCOUNTRY PROMOTIONAL ACTIVITIES
- o USEFUL ORGANIZATION, OFFERING UNIQUE SERVICES AT ECONOMIES OF SCALE

## I. FINDINGS

### A. ORGANIZATIONAL

- o ORGANIZED ALONG SERVICE AREA LINES
- o HEADED BY A DIRECTOR AND A DEPUTY DIRECTOR
- o BOARD COMPOSED OF CENTRAL AMERICAN MINISTERS OF ECONOMY
- o RECENT EMPHASIS PLACED ON IMPROVING FINANCIAL CONTROL AND PROJECT MANAGEMENT
- o DONOR PROJECTS HAVE SUSTAINED ICAITI'S RECENT REGIONAL ACTIVITIES
- o PLANNING SHORT TERM IN NATURE DUE TO POLITICAL AND ECONOMIC UNCERTAINTY

### B. TECHNICAL

- o FOUNDED TO:
  - PROVIDE TECHNICAL SERVICES TO THE REGION'S INDUSTRIAL SECTOR
  - CONDUCT RESEARCH ON PRODUCTS AND PROCESSES USING REGIONAL RESOURCES
  - ADVISE AND PROVIDE INFORMATION ON INDUSTRIAL TECHNOLOGY
  - SETTING STANDARDS FOR RAW, INTERMEDIATE AND FINISHED GOODS
  - QUALITY CONTROL ANALYSIS OF PRODUCTS

- o EIGHT TECHNICAL DIVISIONS
  - TECHNICAL AND INDUSTRIAL SERVICES
  - APPLIED RESEARCH
  - ANALYSIS AND TESTING
  - NORMS AND STANDARDS
  - DOCUMENTATION AND INFORMATION
  - TECHNICAL PUBLICATIONS
  - APPLIED GEOLOGY
  - SCIENTIFIC POLICY
- o TRAINING
- o TECHNICAL ASSISTANCE
- o TECHNICAL SERVICES
- o RESEARCH

PROGRAMS AND ACTIVITIES CONSIDERED RELEVANT TO REGIONAL NEEDS

C. FINANCIAL

- o TOTAL 1982 REVENUES = \$2,225,000
- o TOTAL CONTRACT REVENUES = \$1,289,000; AID CONTRACTS = 50%

54

- o MEMBER QUOTAS RANGE FROM \$80K (GUATEMALA) TO \$75K FOR OTHER MEMBERS
- o REGIONAL AND INSTITUTIONAL ORGANIZATIONS EXPECTED TO BE PRINCIPAL SOURCE OF FINANCIAL GROWTH

5

## II. ISSUES

1. ICAITI AND CENTRAL AMERICAN INDUSTRIAL AND ECONOMIC DEVELOPMENT
2. COMPARATIVE ADVANTAGES
3. TRAINING AND EXTENSION
4. SPECIALIZATION
5. PROMOTION
6. LINKAGES WITH NATIONAL AND INTERNATIONAL ORGANIZATIONS
7. ROLE OF DONORS
8. COUNTRY CONTRIBUTIONS
9. CONTINUITY AND GROWTH

### III. RECOMMENDATIONS

1. CONSIDER THE CREATION OF A TRAINING COORDINATING OFFICE.
2. AVOID EXPANSION INTO LARGER SCALE ROLES OF TECHNOLOGY DISSEMINATION.
3. PREPARE MORE COMPREHENSIVE TECHNICAL DATA ON TECHNOLOGIES PROMOTED.
4. REPORT MORE FULLY ON TECHNOLOGICAL SUCCESSES AND FAILURES EXPERIENCED.
5. CAREFULLY CONSIDER LONG TERM APPLICATION OF FIELDS FOR FUTURE EXPANSION.
6. MAINTAIN A BALANCE BETWEEN AID PROJECT NEEDS AND ICAITI'S CAPABILITIES.
7. CONTINUE EXPANSION AND INCREASE AUTONOMY OF ICAITI'S FIELD STRUCTURE.
8. MAINTAIN ADEQUATE PROJECT MANAGEMENT, PROMOTION AND TECHNICAL RESOURCES AT THE FIELD OFFICE LEVEL.
9. ROCAP MAKE BILATERAL MISSIONS MORE AWARE OF ICAITI CAPABILITIES.
10. PLACE MORE EMPHASIS ON SMALL AND MEDIUM SCALE INDUSTRIES.
11. RECONSTITUTE THE BOARD OF DIRECTORS.
12. INCREASE PROJECT MANAGEMENT INFORMATION CAPABILITIES IN THE FINANCIAL REPORTING SYSTEM.
13. BUILD MORE MANAGEMENT INFORMATION CAPABILITIES INTO THE FINANCIAL REPORTING SYSTEM.
14. CHARGE A FEE IN ADDITION TO THE COST OF SERVICES PROVIDED.