



**INTER-AMERICAN INSTITUTE FOR COOPERATION ON
AGRICULTURE -IICA-**

**TOWARD A PROGRAM FOR COOPERATION IN RESEARCH AND TECHNOLOGY
DEVELOPMENT AMONG THE COUNTRIES OF THE NORTHERN REGIONAL
CENTER:**

PROCINORTE

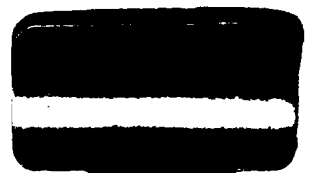
Preliminary document for internal discussion

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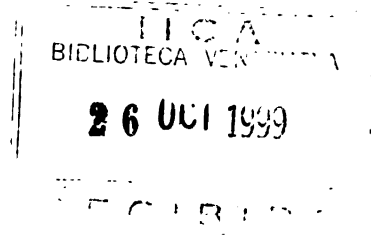
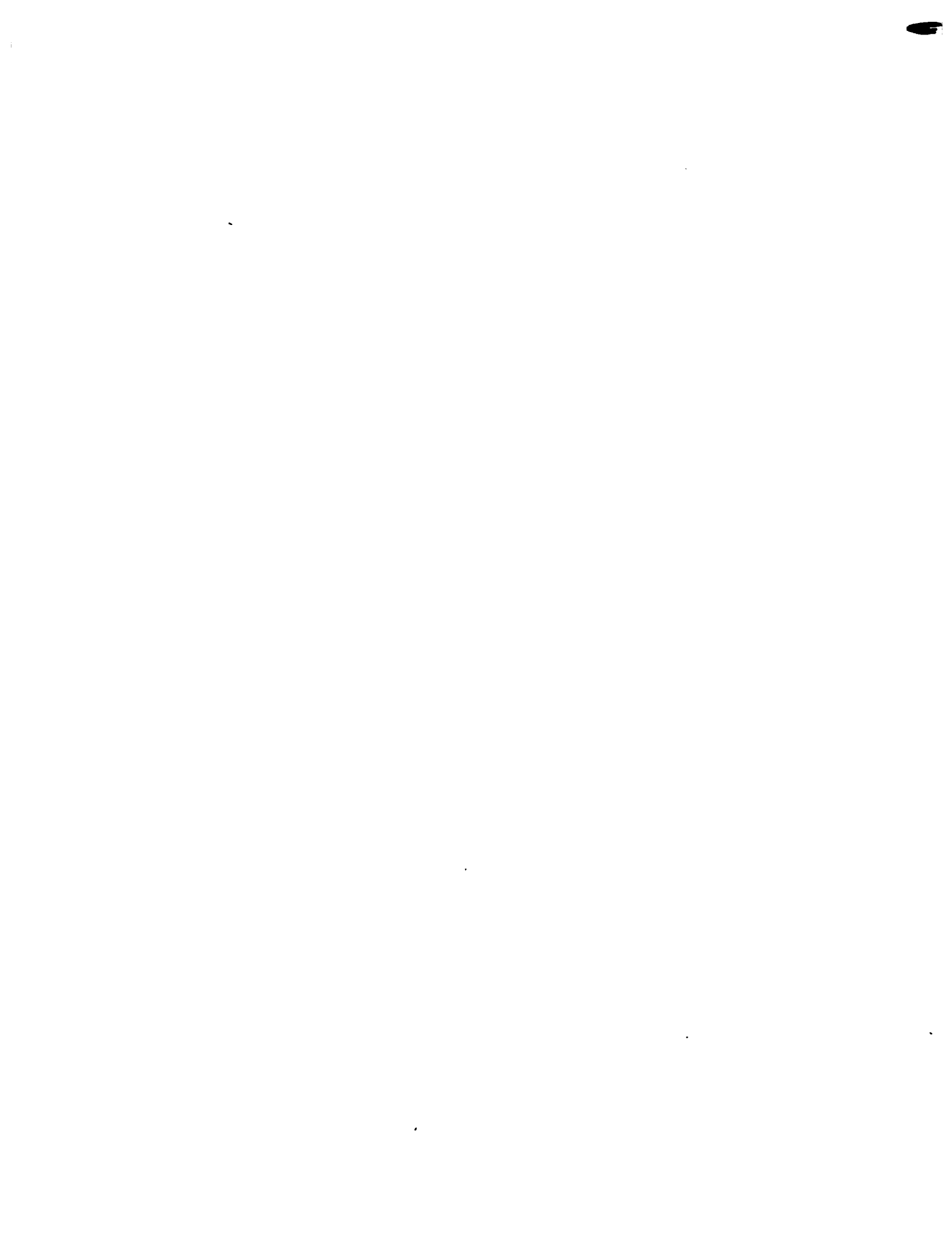


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1. INTRODUCTION

A productive and efficient transformation of agriculture requires adequate levels of production and productivity in terms of traditional products, and the introduction of new ones, as well as the sustainable use of the natural resource base of the countries of IICA's Northern Regional Center (NRC): Canada, the United States of America and Mexico.

The opportunities that are opening up today thanks to the new regional and world order, and the magnitude and complexity of the problems affecting agriculture, often are beyond the capabilities of individual countries. This fact, in a geopolitical framework that is leading to the opening of trade throughout the region and the hemisphere, is the reason why today, more than ever, the countries and the institutions that support agriculture are intensifying their collaborative efforts and are moving toward technological integration.

During the second half of the 1990s, the countries, in different national, subregional and regional fora and mechanisms, have recognized that their political and economic integration is a necessity. Proof of this can be found in the efforts to create the FTAA 2005, and the MERCOSUR, CAC, NAFTA and other agreements.

A mechanism for cooperation among the research and technology development institutions of the countries could be a strategic alternative for improving the efficiency and effectiveness of research and facilitating technological integration at the subregional level and in the Americas.

The purpose of this document, prepared jointly by the Directorate of Science and Technology and Natural Resources of the Technical Consortium, and the Directorate of the NRC, is to serve as input for preliminary discussions by the Advisory Council of the NRC on the advisability and importance of promoting ongoing and systematic reciprocal cooperation in agricultural research and technology development among the three countries of the NRC, through a program which tentatively is being called PROCINORTE.

2. ANTECEDENTS

2.1 Scope and origin of the initiative

NAFTA, which is the most important initiative undertaken to date to promote the economic integration of the countries of the NRC, provides a suitable framework for additional efforts aimed at integration in fields such as technology. It is also necessary to promote horizontal cooperation programs, with a view to addressing common problems in the area of research and technology development, and fostering technological integration.

At the subregional level, IICA has been cooperating with its member countries in the design and execution of cooperative agricultural research programs, known as PROCIs, in Central America, the Caribbean and South America. Also, at the regional level, the member countries have instructed IICA to promote the Regional Forum for Agricultural Research and Technology Development, which is seen as a mechanism for discussing the most important issues affecting agriculture in the Americas today, from the perspective of technology.

It is believed that the articulation of the countries of the NRC into a cooperative mechanism would make it possible to intensify the transfer of experiences in and the results of research and technology development, in those areas agreed upon by the participating institutions.

The strategic plan of the NRC attaches great priority to the institutions in its three member countries becoming true partners among themselves and in IICA's technical cooperation actions, thus adding value to the agricultural sector of the subregion and the hemisphere.



In this context, the Director General of IICA suggested that the NRC should have a mechanism similar to those in the other regions, with a view to promoting its articulation with the processes of regional cooperation and technological integration of the hemisphere. To this end, the NRC and IICA's Technical Consortium would work together, and with the countries, to determine if the initiative and the establishment of the mechanism are feasible.

IICA and the institutions in the member countries of the NRC have expressed interest in such a cooperation mechanism. This topic will be discussed in greater detail during the upcoming meeting of the Advisory Council of the Northern Regional Center, scheduled for July 1998 in Washington, D.C.

It is important to recall that the countries of the NRC have been engaged in bilateral and trilateral cooperation for some time. Examples are the INIFAP/ARS and SAGAR/ARS agreements on the monitoring of harvests; the Texas A&M Mexico initiative, which includes teleconferences; the INIFAP/CANADA/USA initiative on the inventorying and monitoring of forests; the Stanford University/Mexico agreements on research to evaluate ammonia in wheat; MIRAMERICAN, plus several research and training agreement among universities in Canada, the United States and Mexico.

2.2 IICA's experiences in reciprocal cooperation

IICA's provides two basic types of technical cooperation to the research and technology development institutions of its member countries. The first is direct technical cooperation, using its own technical resources and/or combining them with those of other institutions. The second refers to promoting and establishing linkages among national institutions and between them and international technical and scientific organizations, with a view to their collaborating in the search for solutions to common problems. The PROCIs and specialized networks are examples of the latter. IICA provides cooperation to these mechanisms in the institutional-legal, technical and administrative arenas.

The PROCIs are multinational institutional mechanisms aimed at strengthening scientific and technological exchanges and the development of new technologies, at promoting the multidirectional transfer of agricultural technologies, and at the institutional strengthening of the participating organizations, and, thus, promoting technological integration. The PROCIs are operated by the countries and sponsored by IICA, which, in turn, would cooperate with them and, pursuant to a common agenda, channels its technical cooperation activities in support of agricultural development.

The PROCIs and equivalent mechanisms are an important part of the response to the priorities identified by the countries within the process of integration, and are IICA's response to a mandate set forth by the IABA and the subregional integration mechanisms.

IICA has been cooperating with the member countries in the creation and implementation of the PROCIs and other high-impact networks since the late 1970s (PROMECAFE and PROCISUR); intensifying its actions in the 1980s (PROMECAFE, RISPAL and PROCACAO) and in the 1990s (PROCICARIBE, with CARDI, REDCAHOR, with AVRDC, and REMERFI and REDARFIT, with CATIE and IPGRI). In 1996, IICA supported the design of SICTA, a mechanism created by the CAC, and is participating in its implementation. This work has been carried out with important technical and financial cooperation from the countries themselves, regional research centers such as CARDI and CATIE and international organizations and cooperation agencies (such as the IDB, AID, CIRAD, ORSTOM, EU and IDRC).

Figure 1 shows the geographical location of the PROCIs, including tentatively PROCINORTE, which would cover Canada, the United States of America and Mexico and would be open to articulation with the other PROCIs.

The PROCIs are a visible and unique model of cooperation that is recognized by the international technical and financial community that supports agricultural research. In national and, above all, international fora, publications and research programs, the name PROCIs is associated immediately with the name of the NARIs and IICA.

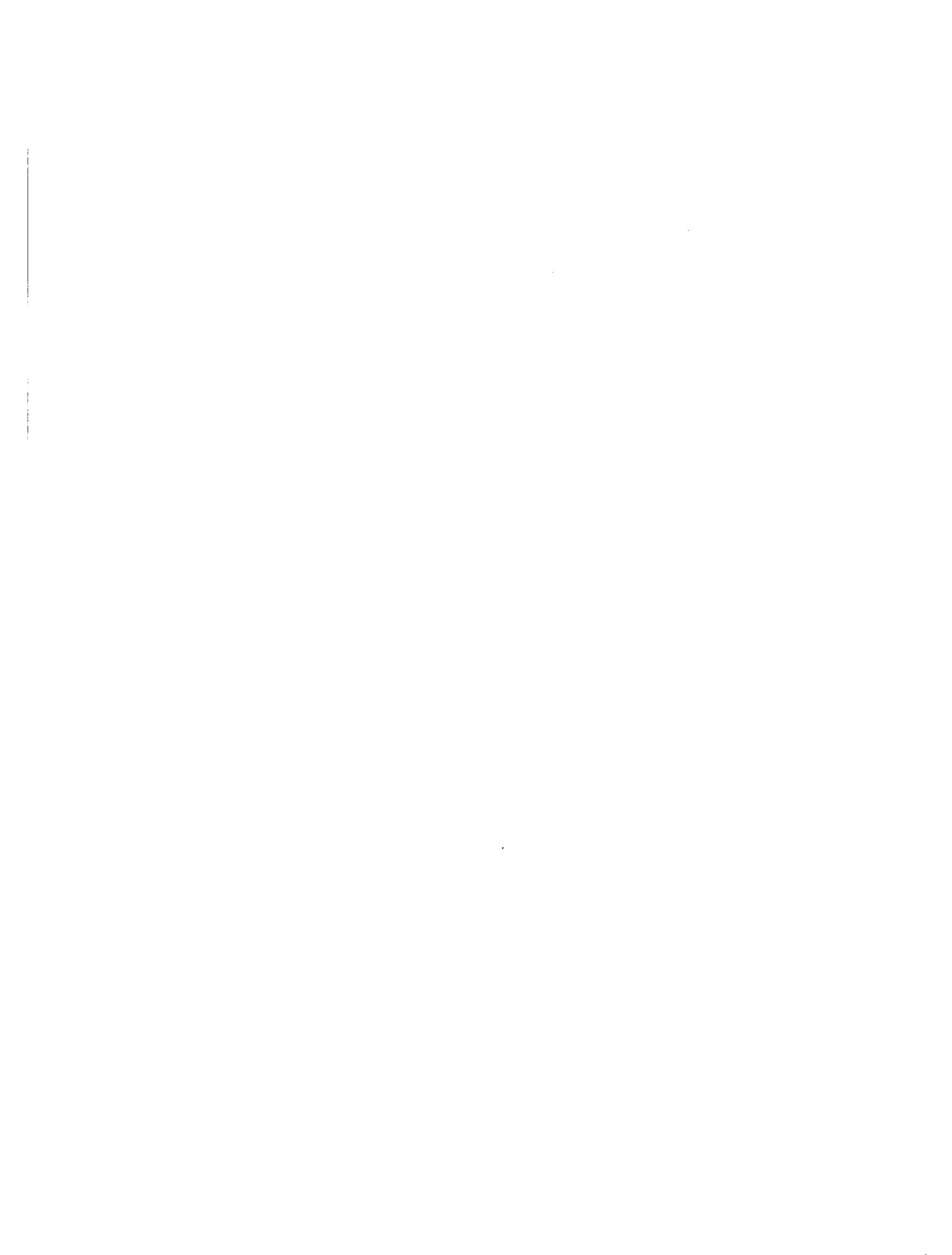
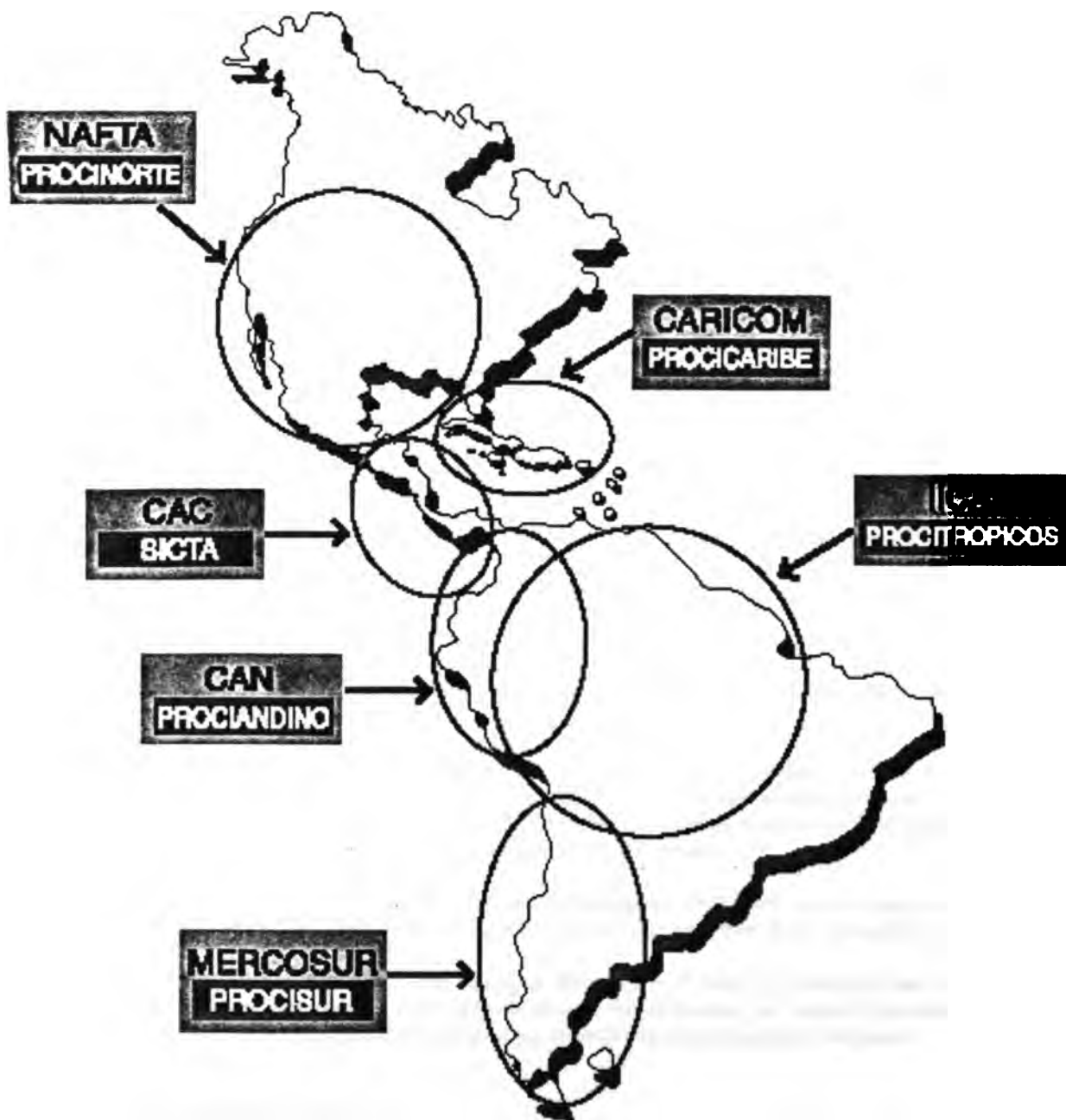
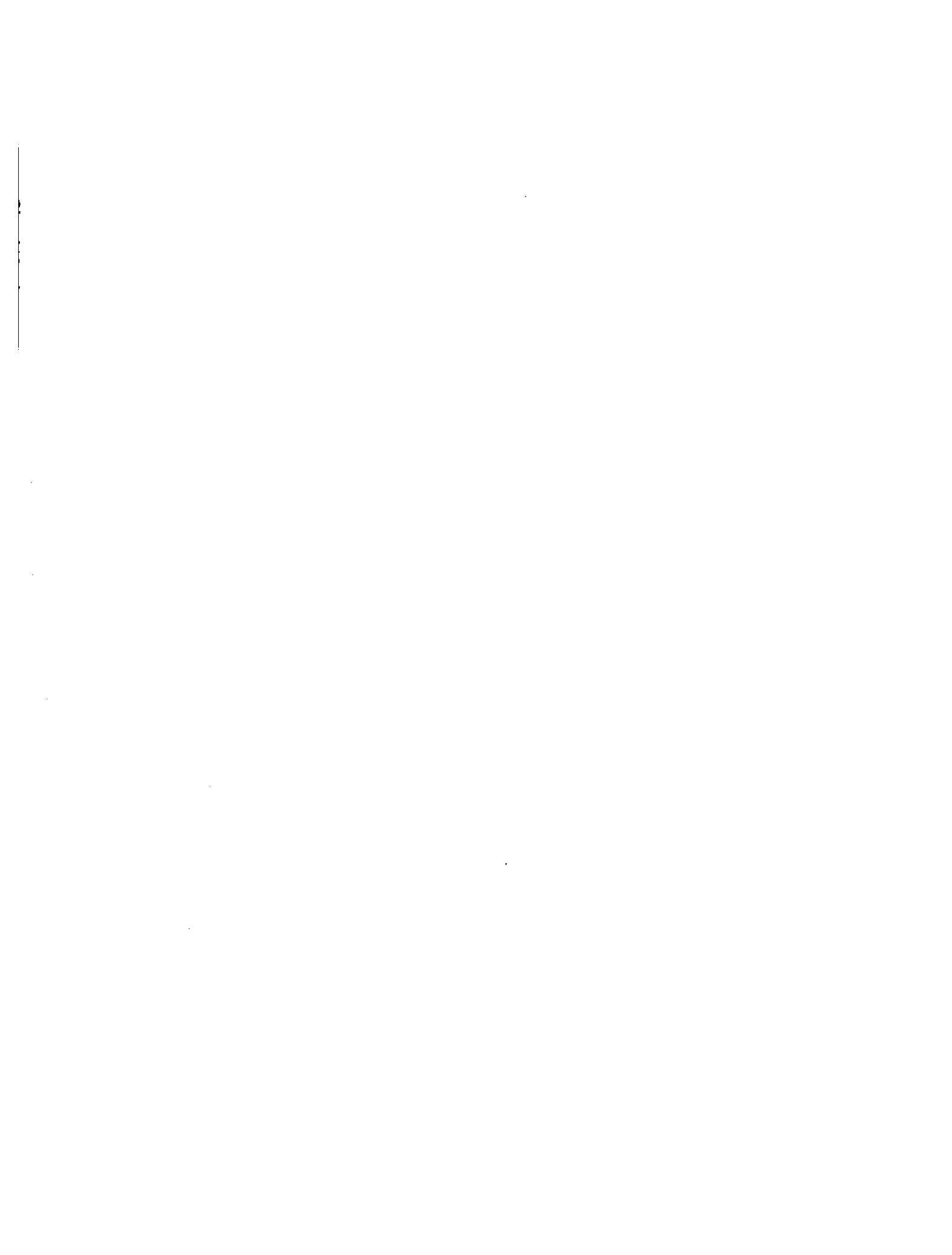


FIGURE 1

**RELATIONSHIP BETWEEN THE REGIONAL
INTEGRATION MECHANISMS AND THE PROCIS
(AND EQUIVALENT MECHANISMS)**





The actions of the PROCIs in the areas of collaborative research, technology transfer, training, information and institutional development, among others, have enabled the countries to make important technological achievements that have provided a solid economic return on the investments in cooperative research. External evaluations contracted by IICA revealed the following internal rates return: PROCISUR 110-179%, PROMECAFE 48% and PROCIANDINO 26%.

3. THE IMPORTANCE OF AND CHALLENGES FACING AGRICULTURE IN THE COUNTRIES OF THE NORTHERN REGIONAL CENTER

The macro indicators related to agriculture in Canada, the United States and Mexico show that this market of more than 362 million consumers generates a gross domestic product of \$5.9 trillion. In these three countries, the growth of the economy is fluctuating between 4.0% and 2.7% of GDP for 1998, and trade totals US\$225 billion.

In general, the implementation of NAFTA¹ (January 1994) has had a positive, but modest, impact on the agricultural sectors of the region, promoting greater integration of their markets. Agricultural trade among the three countries has grown rapidly and most barriers and tariffs have been eliminated. However, it is believed that it will probably take longer for the full benefits of liberalization to be felt. NAFTA has affected the agricultural sectors of the countries in different ways. In the case of the United States, agricultural exports to Mexico and Canada are 3% and 7% greater, respectively, than before the Treaty, and agricultural imports from Mexico and Canada are 3% and 5%, respectively, higher than they would be without NAFTA.

The agricultural products have been most advantageous for exportation from the United States to Mexico are cattle, meat, pork, milk and sorghum, and for Canada from the United States, wheat by-products, oils and meat.

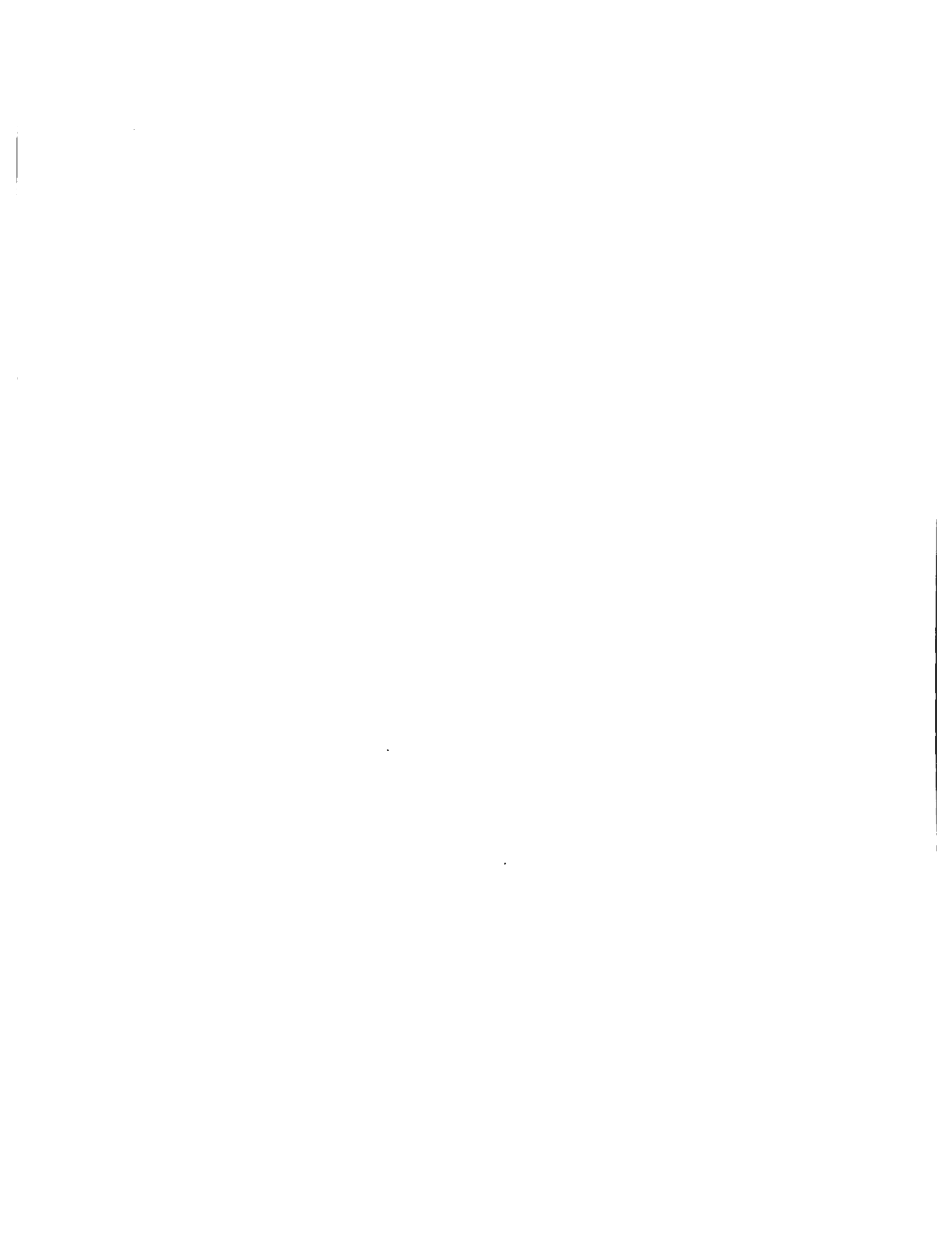
In absolute terms, agricultural exports from the United States to Mexico and Canada grew from US\$8.87 billion in 1993 to US\$11.59 billion in 1996, and, during the same period, agricultural imports from Mexico and Canada to the United States grew from US\$7.33 billion to US\$10.5 billion.

Agricultural trade among these countries was affected temporarily (1994-1996) by the devaluation of the Mexican peso. While it is true that the Treaty is only one of the many factors that affect agriculture of the countries of the NRC, the open market among these three countries has reduced the impact of variations in agricultural production at the local level as a result of adverse climatic conditions, a more stable supply and less variation in the prices paid by consumers.

The agricultural sectors of the United States, Mexico and Canada will continue to face challenges and opportunities, including:

- Greater integration of the markets under NAFTA. The integration of markets is still in an early stage, and all agree that NAFTA is one of the many factors that affect agricultural markets. Agricultural products destined for the countries of the NRC will be subject to more stringent food safety measures, which may lead to reductions in volume and/or variations in prices.
- The advisability of accelerating scientific and technological articulation vis-à-vis agriculture among the countries of the NRC, and their articulation with the other countries of the hemisphere.
- The expansion of knowledge in the countries through the creation of synergies and links among institutions. This strengthening in the areas of science and technology will make it possible to develop and support technical changes aimed at meeting demand and promoting trade integration.

¹ For further information, see USDA-NAFTA: International Agriculture and Trade, September 3, 1997, 94 pgs.



- The impact of climatic conditions in this region and other regions of the hemisphere may affect agricultural trade and domestic and international prices in the short term. The impact of El Niño in Latin America has reduced the purchasing power of several countries and affected production levels for several agricultural products. In the countries of the NRC, adverse weather in 1998 may make some foods more expensive for consumers.

In summary, the growth and sustainability of agriculture in these countries will be influenced by several factors, especially the trade integration process, the strengthening of scientific and technological cooperation among them in the area of agriculture, and their articulation with the other countries of the hemisphere.

4. JUSTIFICATION

In recent years, as a result of economic opening and integration, international agricultural markets have grown much faster than production. This fact has made it all the more urgent to increase agricultural productivity and competitiveness, which, in turn, has been translated into a growing demand for technology at the national and international levels.

In this past, there has been an almost natural transfer of technologies (spillover effect) between countries and among regions of the same country, increasing productivity and making agriculture more profitable. Evidence of this effect can be found in the analysis conducted by Jorge Fernandez and Richard Shumway, which concludes that an increase of 1% in the factorial productivity of agriculture in the United States increases agricultural productivity in Mexico by 1.1%, thus confirming the important role played by the transfer of technology. The findings of this analysis also suggest that investments in agricultural research in Mexico can have an impact on the growth of agricultural productivity in the United States, thus confirming a two-way transfer of agricultural technology in which both countries win.

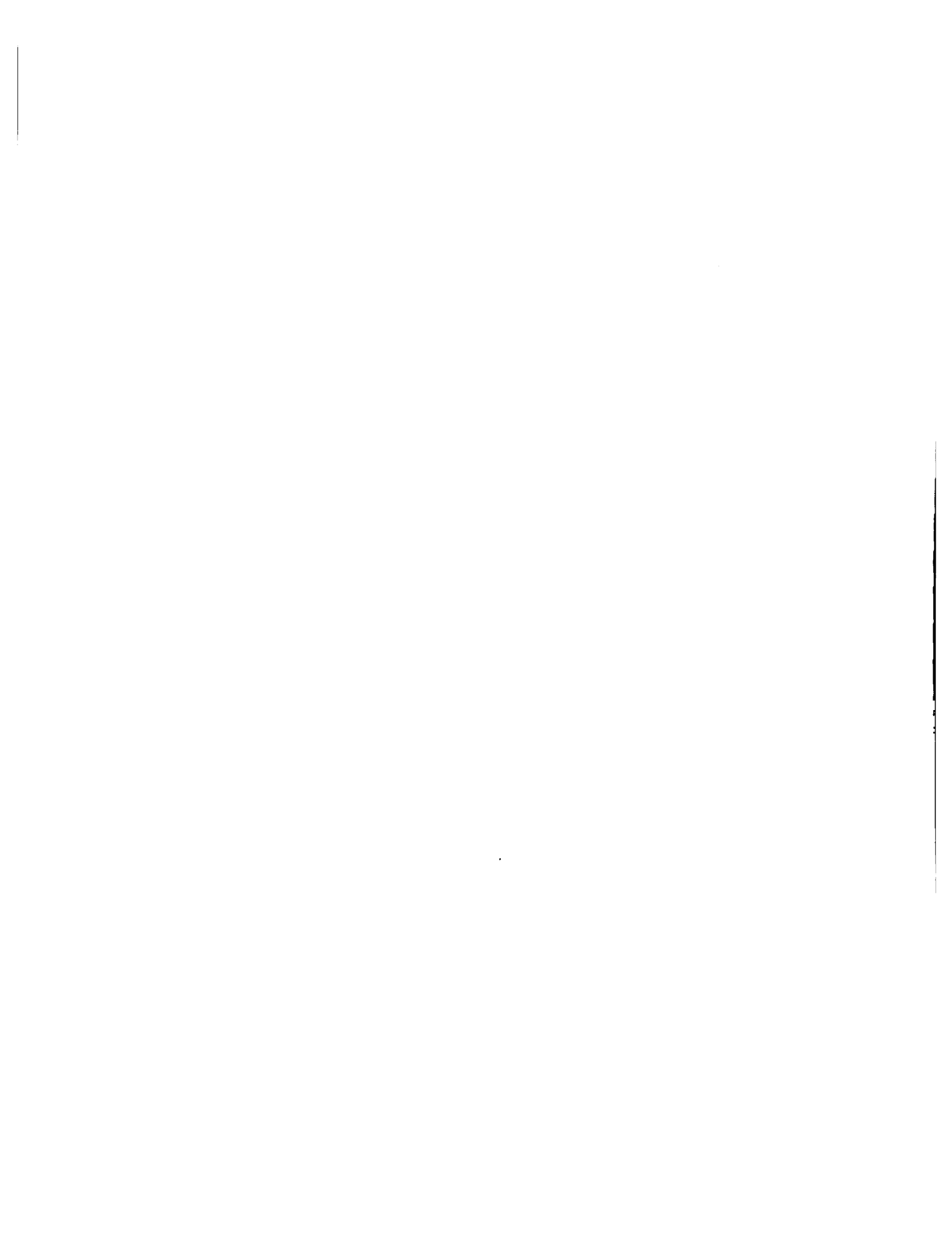
When such a two-way transfer process, or spillovers, takes place within the framework of a mechanism or program aimed at facilitating and reinforcing exchanges and promoting cooperation in research, the effect on productivity and the profitability of investments in research can be even greater. This refers not only to support in transferring results, but also to the promotion of joint initiatives aimed at generating the new technologies required to solve problems shared by the participants.

An important example of this is the economic evaluation conducted by Robert Evenson and Elmar Rodriguez, in which the estimated rates of return on investments in the program for reciprocal cooperation in agricultural research for the countries of the Southern Cone, PROCISUR, were, in every case, superior to those on investments made by individual countries. This analysis also revealed significant increases in productivity in geo-climatic zones surrounding the sites where the research was conducted, even in cases where the capacity for research in such zones was limited.

These results show that reciprocal cooperation in agricultural research is highly profitable, and can add value to the economic benefits received by the participating countries. Hence, the effect on competitiveness and on the management of natural resources can be positive, depending on the type of technologies that are selected.

5. ISSUES TO BE RESOLVED

The countries of the NRC now have the opportunity to develop an open and participatory mechanism for fostering strategic alliances, supporting the exchange of experiences, and promoting institutional articulation, with a view to finding solutions to shared priority problems and ensuring greater technological integration, to the benefit of agriculture. Also, this mechanism can be an effective vehicle for articulating the research institutions of the NRC with the collaborative research mechanisms operating in Latin America and the Caribbean.



6. NATURE, PURPOSE AND OBJECTIVES OF PROCINORTE

6.1 Nature

PROCINORTE would be a multinational institutional arrangement aimed at strengthening, through reciprocal collaboration in matters related to agriculture and agroindustry, technological integration and relations among institutions.

PROCINORTE would be a mechanism comprising public and private institutions from Canada, the United States and Mexico, sponsored by IICA, which, in turn, would cooperate with them and, pursuant to a common agenda, channel its technical cooperation activities in support of agricultural development.

PROCINORTE would execute actions that cannot be carried out individually by the participating countries, making it possible not only to increase the exchange of technology among countries, but also to expand the knowledge applied to the topics identified as priorities.

6.2 Purpose

To promote and facilitate articulation and joint actions (partnerships) among the research and technology development institutions of the participating countries, in support of agricultural development, within the framework of trade integration in the NRC and the Americas.

6.3 Objectives

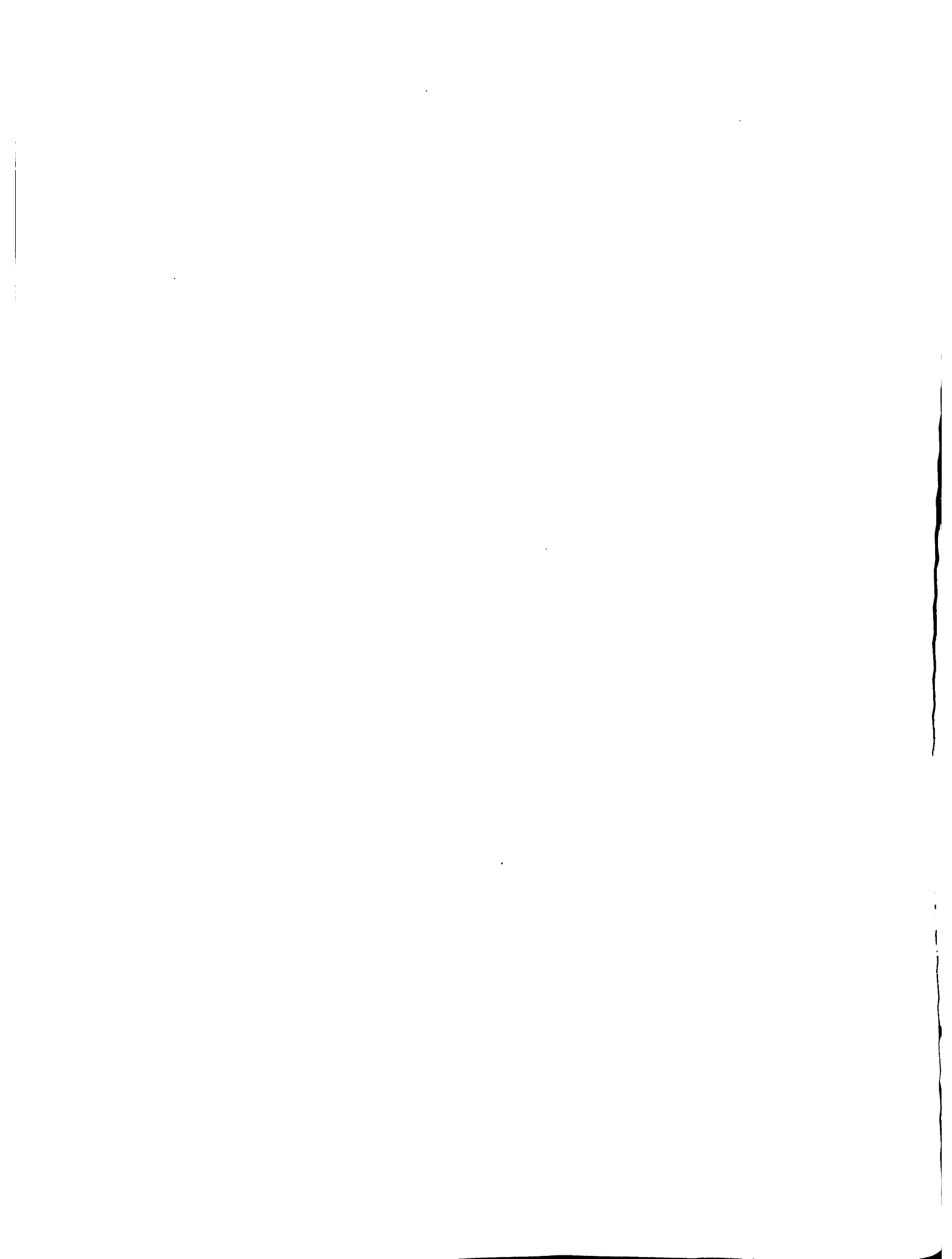
- To promote and intensify the transfer of experiences in and the results of research in those fields agreed upon with the participating institutions.
- To manage joint research and technology development initiatives aimed at defining and solving problems and at tapping common advantages and opportunities.
- To facilitate the articulation of the countries of the Northern Regional Center to the process of reciprocal cooperation and technological integration being promoted by IICA with Latin America and the Caribbean.
- To complement IICA's efforts to create an inter-American system of research and technology development institutions.

7. UNDERLYING PRINCIPLES OF PROCINORTE

Scientific and technological strengthening of the countries. The mechanism will focus its action on expanding the knowledge of the countries, by promoting synergies among their agricultural research and technology development institutions, in the form of partnerships. Also, the mechanism must facilitate the use of existing technologies derived from agricultural research activities.

Geographic scope of action. The mechanism would concentrate its activities in the member countries of the NRC. However, given the integration process currently under way in the Americas, this PROCINORTE would be an important vehicle for linking its member countries with the regional research and technology development system of Latin America and the Caribbean.

Actions within the framework of economic integration. The mechanism will operate in the very real context resulting from the opening of trade through NAFTA. Therefore, it must promote not only reciprocal cooperation among countries, but also the process of technological integration that will accompany trade integration.



Use of existing agricultural scientific and technological institutions. In the countries of the NRC, there are numerous public and private institutions at the national, state and provincial levels, as well as bi-national projects and activities in the fields of technological and scientific development. The mechanism will take advantage of and strengthen existing institutions, in the interest of cooperation among the countries.

Actions in the area of technology innovation. Innovation implies taking knowledge a given market through several sources of knowledge, such as public and private institutions, universities, research organizations, etc. The PROCINORTE will include the public and private institutions that promote, develop and support technical changes aimed at meeting demand.

Differentiation and interdependence. The mechanism will recognize its interdependence with other regions in the framework of hemispheric integration and, therefore, must develop strategies for its articulation with other national systems, PROCINORTES and collaborative networks of other subregions.

Strategic alliances for the mobilization of resources. The mechanism, with support from IICA and other technical and financial cooperation agencies, can secure more technical and financial resources for the execution of the activities proposed.

Simplicity, flexibility and governability. The model on which the mechanism is based must be as simple as possible, but also inclusive and participatory. Also, its functional structure must be flexible. The participating institutions will govern the mechanism.

Funding of the activities of the mechanism. While IICA will contribute to the funding of the mechanism, it is necessary to identify and obtain financial resources for the execution of the specific collaborative activities agreed upon.

8. AN OVERVIEW OF THE MODEL TO BE PROPOSED

Below is a summary of what could be the principal characteristics of the institutional model suggested for PROCINORTE. Obviously, this must be discussed in greater detail during the process of designing and reaching agreement on the mechanism.

8.1 Participating institutions

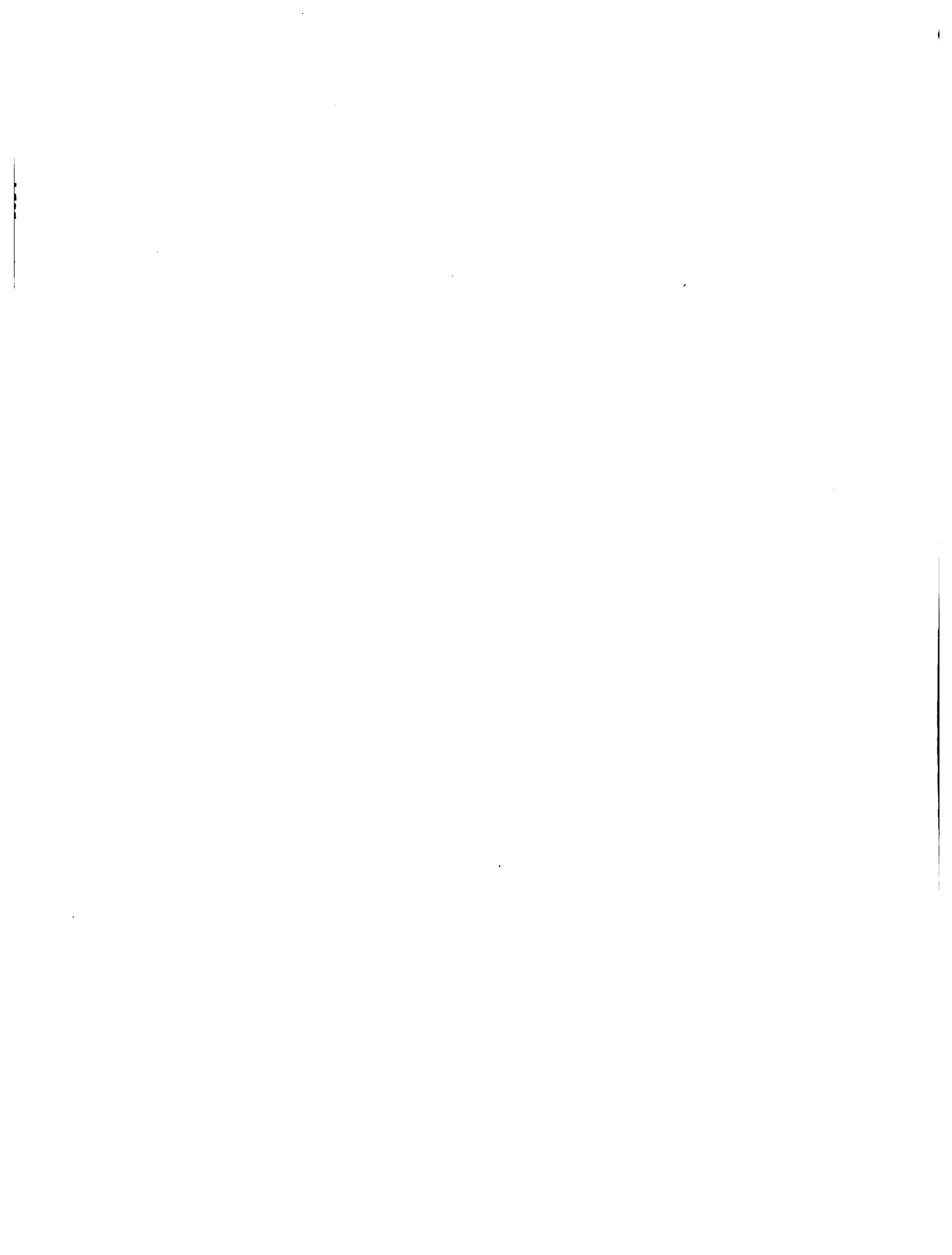
Participation in the mechanism will be open to public and private research and technology development institutions that carry out research and technology development activities, such as foundations, research centers, universities and producer organizations.

In the process of building the mechanism, efforts must be made to identify the most representative research institutions in each country, which will promote the mechanism. Examples of such institutions that could sit on a steering committee would be: for Canada, Agriculture Canada-Research Bureau, CASCC/CARC system; for the United States, ARS-USDA, ERS, CRIS, NASULGC, National Agricultural Library; and for Mexico, INIFAP, Universities (Chapingo, UNAM, Monterrey), CONACYT, National Polytechnic Institute. Which institutions will participate can be defined more clearly once the technical topics to be addressed and the activities to be carried out under the same have been identified.

8.2 Mandate and potential for cooperation

The fundamental mandate is derived from the mission and objectives. It is proposed that the mandate be to promote and articulate joint efforts in the areas of research and technology development, with a view to solving problems common to the agricultural sectors of the three countries.

It is suggested that an initial study be conducted to identify the potential for cooperation and joint efforts in the areas of research and technology development, covering the following aspects:



- **Characterization of agriculture in the countries, and relevant issues**
- **Status of agricultural trade in the region, identifying technical barriers to growth**
- **Description of institutional capabilities for research and technology transfer, and the resources available**
- **Analysis of existing cooperative mechanisms and actions under way**
- **Proposal on priority areas of work to be included in the cooperative program**

8.3 Possible areas and topics of common interest

The areas and topics of work under PROCINORTE will be identified by the participating institutions themselves. Below are examples of the topics that could be addressed by this mechanism.

➤ **Information:**

- a. Directory of institutions and researchers in the region
- b. Network of agricultural libraries

➤ **Agriculture/Natural Resources**

- a. Surface water management network
- b. Network of plant and animal germ plasm banks

➤ **Development of new biotechnologies**

- a. Network of laboratories for research to determine the quality of exports
- b. Network of animal science research laboratories (physiology, nutrition, animal health)
- c. Network of plant biotechnology laboratories

➤ **Regional institutional development**

- a. Exchanges of experiences, and joint activities with PROCIs and networks of LAC
- b. Participation in the Regional Forum for Agricultural Research and Technology Development
- c. Research through strategic regional projects

➤ **Technology transfer**

- a. Exchange of methodologies and research results
- c. Exchange of experiences in the incorporation of technologies among producer organizations
- d. Methodologies for and experiences in agricultural extension

➤ **Joint analysis of critical aspects of supporting technological integration**

- a. Emerging markets in the three countries: production capacities and trade
- b. Technical barriers to agricultural trade
- c. Development of intellectual property
- d. Research and technical assistance in agricultural marketing systems
- e. Investments in agricultural technology innovation

8.4 Management System

The proposed management system would include a Management Council, comprising a representative of each country and a representative of IICA, the Director of the Northern Regional Center. It is also proposed, as in the case of the other PROCIs, that the Director of Area II participate on behalf of IICA. The Council will elect one of the country representatives as Chairperson.

It is expected that each country would represent its fundamental interests in terms of agricultural cooperation for research, identifying organizations or representations in both the public and private sectors and the academic community that are interested in the program.

The mechanism would have a Coordinator, who would be provided or hired by IICA by mutual agreement with the Management Council in accordance with existing rules. There are also plans for the organization of programs or work components around the topics selected as priorities, examples of which are given in

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section 8.3. These could be grouped as follows: i) information and scientific and technological exchanges, ii) agricultural research and horizontal transfer of technology, iii) technological linkages for agricultural and trade development, and iv) training in science and technology.

Each component or program would have a leader who would act as liaison and a promoter of actions, provided by one of the participating institutions on a part-time basis and at no cost to the program.

8.5 Operating strategy

PROCINORTE would be developed gradually, beginning with activities such as information and the promotion of improved communication among institutions. This could be achieved by promoting, initially, the organization of electronic networks, moving on to the execution of collaborative activities among institutions of the three countries. The basic operating strategy would be based on projects with fixed timeframes for execution, subject to the availability of funding. Under this strategy, consideration must be given to several alternatives for work, such as the establishment of virtual networks and systems of information; organization of specialized thematic networks for joint institutional action; exchanges of experiences; and/or the concentration of teams from several countries in a single work place to conduct research.

8.6 Operating costs and funding of projects

The fixed costs of coordinating the mechanism will be covered by IICA with the support of the participating institutions, using the formula eventually developed.

The variable costs of the projects will be funded with contributions from technical and financial cooperation agencies, institutions of the participating governments and external resources from other contributors.

8.7 Headquarters of the mechanism and execution of activities

The site of the Coordinator's Office will be selected by mutual agreement among the institutions. The activities will be carried out in the countries by the participating institutions.

9. POTENTIAL BENEFITS OF THE PROGRAM

The proposed program could provide:
(See figure 2.)

- Direct economic and trade benefits for the countries, as a result of contributions to the solution of common problems identified as priorities. Such benefits would derive from the results of the program, and their subsequent effects on supply and on the reduction of per-unit production costs.
- Scientific benefits, as a result of increases in knowledge, in the management of new methodologies and, in general, scientific and technological capabilities.
- Indirect economic benefits, as a result of the additional effect produced by the use of the technologies promoted in other countries and regions.



Figure 2
TYPES OF TRANSFER
PROCINORTE



I) Within the region

**II) From the region to
LAC**

**III) From LAC to the
region**

**IV) With others regions
of the world**



10. PROCESS TO DESIGN AND CREATE PROCINORTE

Considering that this document is intended to provide input for the discussions of the Advisory Council of the NRC, and in the belief that it would be a step forward in making the initiative a reality, summarized below are the initial steps already taken and those expected to be taken in the future:

a) Identification of the initiative

- Regional Directorate-Guidelines for IICA's cooperation with the PROCIs
- Meeting IICA-SARH Mexico
- Meeting Advisory Council of the Northern Regional Center

Products: Consensus and support for carrying out the process leading to PROCINORTE

b) Preparation of terms of reference and establishment of a task force

- Preparation of terms of reference for formulation of proposal
- Establishment of task force: IICA (Northern Regional Center-Technical Consortium-Dir. Area II) and promoting institutions of the three countries
- Selection of one or two professionals from each country to design the proposal (to identify needs and capabilities in the countries, possible topics for joint action, overview of the model, institutional actors)

Products: Task force set up, terms of reference and consultants to carry out the work oriented by IICA.

c) Formulation of the proposal on PROCINORTE

- Visits by consulting team to the countries and key institutions
- Preparation of the first draft
- Orientation and monitoring of work by Area II

Product: First version of the document: Proposal for the creation of a collaborative research and technology development program in the Northern Regional Center, PROCINORTE

d) Consultation on the proposal

- Within IICA: Regional Center (TCAs)-Technical Consortium,, Steering Committee of the Consortia and General Directorate

Product: the proposal internalized, and its "launching" endorsed

-Outside IICA:

- a. National consultation: delivery to individual institutions for observations and comments from institutions participating in the mechanism
- b. Regional consultation: First Preparatory meeting for the creation of PROCINORTE in a country and place to be determined..

Product: Proposal endorsed by the clients, and declaration of intention to promote the creation and implementation of PROCINORTE.

d) Creation and implementation of the mechanism

Work during this stage will consist of providing a legal framework for the mechanism, establishing its Council, convening the first meeting of the Management Council, deciding on the duty station of the Coordinator, formulating and approving an initial work plan, etc.



10.1 Tentative time table

Task	Date
1. Identification of initiative	July/98
2. Establishment of task force, terms of reference	August/98
3. Formulation of proposal on PROCINORTE	November/98
4. Consultation of proposal	February/98
5. Creation and instrumentation of mechanism	October/98

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