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PROJECT PROPOSAL
FOR
THE ESTABLISHMENT
OF
A CARIBBEAN CO-OPERATIVE AGRICULTURAL RESEARCH
NETWORK

Economic Commission for Latin America and the Caribbean
Port-of-Spain

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CO-OPERATIVE AGRICULTURAL RESEARCH PROGRAMME
FOR THE CARIBBEAN

SUMMARY

This document sets out a proposal to establish a Caribbean Co-operative Agricultural Research Network to serve the countries of the Caribbean Development and Co-operation Committee (CDCC).

The activities will be carried out along the lines of a horizontal co-operation (TCDC) programme with necessary donor support and input in kind by the participating countries.

The overall objectives are to strengthen research capability at the national level and to increase the production and productivity of agricultural commodities essential to the nutrition of the population and to the economy of the countries of the subregion.

The specific objectives are to generate technology in the basic food products included in the networking activities; implement a horizontal co-operation programme to make more efficient use of available technology and resources; establish links between the national researchers and also between national researchers and the Consultative Group for International Agricultural Research (CGIAR) and other international research centres to facilitate access to improved technology; and provide support for national research activities which form part of the networking system.

The programme activities can be divided initially into two broad areas:

- (i) Research and Development, including scientific research and the development of new technology; technical co-operation; advisory services to provide, on a short-term basis, specialized expertise not available locally, and the transfer of technology from researchers to the production sector;
- (ii) Strengthening national agricultural research systems, by providing support in terms of advisory services, short-term technical assistance, materials and equipment and also upgrading the technical and professional capability through appropriate training.

During the initial stage, the research will be commodity-oriented with emphasis on tropical root and tuber crops, grain legumes, vegetables with priority being given to onions; and livestock development with emphasis

on pasture management systems and ruminant nutrition. The network will also co-operate with other commodity networking programmes in the Caribbean.

The direction and execution of the networking activities will be entrusted to a research council comprised of the Directors of Agricultural Research from the participating countries. The research and associated activities will be carried out by the staff of the national agricultural research services with the support of Caribbean and international institutions and, where necessary, specialists on assignment for specified periods. Consequently, the network will serve to strengthen national agricultural research capability.

The administration and co-ordination of the networking activities will be entrusted to an existing institution with experience in the execution of TCDC programmes and the capability to work effectively with all member countries of the CDCC,

The activities will be carried out in two phases:

(i) A preparatory phase of six months during which time the work programme will be documented and other necessary preparatory arrangements made in consultation with the participating countries;

(ii) An execution phase of three (3) years in the first instance.

Monitoring and evaluation procedures are also proposed.

I. BACKGROUND

The geographical area which this programme serves includes the member countries of the Caribbean Development and Co-operation Committee (CDCC).^{1/} The CDCC subregion consists of 20 states, of which 16 are independent nations. Two of the countries are located on the continent of South America, one is in Central America and the other 17 are Caribbean Islands.

^{1/} The present members are: Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Christopher/Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago. Associate members are: British Virgin Islands, Montserrat, Netherlands Antilles and U.S. Virgin Islands.

The Constituent Declaration of the CDCC which was inaugurated in 1975 as a subsidiary body of the United Nations Economic Commission for Latin America and the Caribbean, reaffirmed the necessity "to strengthen the unity and co-operation of these countries in order to carry out joint activities that will benefit the subregion's economic and social developmentthat such co-operation constitutes a manifestly useful mechanism for bringing into play the potentialities of the countries of the subregion with the intention of complementing their economies ... in such important spheres as ...agriculture, ...the transfer of technology and technical know-how". The CDCC also decided to "carry out a policy for the optimum utilization of the available resources of the subregion, and to co-operate in the field of agriculture, in order to accelerate the development and use of appropriate and efficient techniques in this sector in the Caribbean countries and formulate joint policies promoting the agricultural complementation of the countries of the subregion".

The concepts and the potential benefits to be derived from functional co-operation in agricultural research have been discussed within the subregion but a programme with potential widespread impact is yet to be implemented.

The FAO study on improving agricultural research in the Caribbean^{2/} indicates that,

"there must be increased and sustained co-operation in agricultural research between national and regional institutions ... of the geographic area" (and)

"regional commodity research projects can be developed and that the funding of these could be a joint-industry/CDB/UNDP/IBRD/IDB and bilateral donors responsibility, or any of these single or jointly, under the auspices of a Caribbean Agricultural Research Co-ordinating Committee to be established".

^{2/} Improving Agricultural Research. Preparatory Assistance. CARIBBEAN AG:DP/RLA/79/001. Terminal Report FAO Rome.

The concept of subregional co-operation in agricultural research was further advanced by the Caribbean Council for Science and Technology (CCST). At the first meeting of the CCST, held in June/July 1981, a decision was taken to establish a number of working groups; including one on agricultural Research. Subsequently, a request was made to the member governments of the CDCC, seeking approval for their Directors of Agriculture to serve as members of the proposed working group. Having had early favourable responses from a number of member governments, a meeting of high ranking officials and experts concerned with policy formulation, policy implementation and management of agricultural research in the CDCC countries was convened in Port of Spain, 26-30 September 1983. That meeting took the form of a Workshop with the following objectives ^{3/}

(i) To examine the relationship between policy, decision-making and research activities;

(ii) To identify and/or suggest mechanisms for consultations between the policy-making and the research communities during the formulation of agricultural research policy guidelines;

(iii) To examine existing research programmes and facilities of regional and national institutions with a view to possible collaboration between the various institutions which may eventually lead to a network of agricultural research within the region.

At that Workshop, the Permanent Secretaries and the Directors of Agricultural Research recommended:

(i) That "the region examine the commonality of its research needs so as to determine areas for national agency research collaboration. This would serve as a basis for establishing linkages between national research agencies towards collaboration and exchange of information on common problems

(ii) The work and capabilities of regional research organizations must be rationalized towards supporting national efforts, filling research gaps (and) working on common or collaborative programmes.

^{3/} Report of the Workshop on Agricultural Research Policy and Management in the Caribbean, (E/CEPAL/CXCC/107) dated 2 December, 1983.

(iii) The establishment of networks for collaboration in research between countries and across the region should be encouraged In the first instance, the networks may concentrate on establishing the bases for co-operation (meetings, exchange of information/materials) on a few commodities, with expansion to other commodities as the network system demonstrates benefits, experience gained, and the weaker national systems strengthened".

The Directors of Agricultural Research agreed that criteria for collaboration would include:

- "1. Common problems and interests;
2. Voluntary initiation;
3. Mutually acceptable benefits in relation to needs to be satisfied;
4. Goals, objectives and programmes must be clear and acceptable;
5. Use of flexible mechanisms in devising and executing programmes;
6. Where joint actions promise maximization of use of limited resources, and are cost and result effective;
7. Mechanisms should serve to strengthen existing institutions rather than establish new ones;
8. General good faith between collaborators;
9. Continued political and financial support for sustaining successful collaborative efforts".

II. INTRODUCTION

The agricultural sector is important in the economy of the member countries of the CDCC, its contribution to GDP ranges from approximately 31 per cent in Dominica, accounting for over 50 per cent of export earnings to some 2.6 per cent of GDP in Trinidad and Tobago.

In recent years, earnings from export agriculture have declined, both in absolute terms and as a percentage of total export earnings. At the same time, the relative importance of domestic agriculture, which is devoted almost entirely to food production, has increased. However, food deficits and food imports continue to grow. The intensification

of foreign exchange constraints which are reflected in the decreasing financial capability to maintain existing high levels of food imports now have adverse effects on the food and nutrition status of groups which are at risk and indicate the urgent need to improve the effectiveness of support systems for the production of important food commodities.

The potential contribution of agricultural research to agricultural development in the Caribbean is often constrained by the small size of research units, the limited range of discipline within the units, and poorly developed systems to facilitate the exchange of experiences at the researcher level and for the transfer of technology from the researcher to the production system.

Analysis of the national agricultural research programmes and commodity research needs indicate a high degree of commonality in a number of Caribbean countries.^{4/} Also the national agricultural research systems must improve their capability to supply the basic services required by their agricultural sectors. At the same time, the countries are looking toward the application of improved agricultural production technology as an important tool to resolve their worsening food and nutrition problems and also to improve the production efficiency of export crops.

It is ironic that many of the countries whose economies rely heavily on agriculture do not have the resources to support an effective national agricultural research system. At the 1983 Workshop, the Directors of Agricultural Research were unanimous in their recommendations that concerted efforts should be made to strengthen the agricultural research capabilities of the CDCC countries and to establish systems through which the agricultural research needs of the various countries could be met. Since it would not be possible to support strong research units in all CDCC member countries, the Directors of Research recommended the establishment of a Caribbean-wide networking system in which the existing agricultural research institutions, commodity organizations and national units could participate. With the establishment of the network, the research capability of the coun-

^{4/} E/CEPAL/CDCC/107: ECLAC. AG.DP/RLA/70/001 FAO, Rome.

tries could be enhanced over time through co-operation programmes in areas such as research, the exchange of information and experiences, and making available, opportunities for in-service training.

At present, agricultural research in the countries of the Caribbean subregion receives both multilateral and bilateral support from financing and development institutions. The international agencies and centres are contributing a flow of valuable information, in particular, the improvement of germplasm and production technology of the products studied by those centres. The countries of the subregion are also receiving support through programmes established by various institutions, foundations and governments in the industrialized countries.

This flow of international support is devoted to strengthening the research capacity of the countries involved by contributing to the financing of their infrastructure and training of their technical personnel, thereby making it possible to achieve a substantial increase in their achievements in the field of research. These actions of a bilateral character have, in most instances, made only modest contributions to the systematic exchange of experiences between national investigators within the Caribbean, despite the fact that the wider utilization of results obtained under similar ecological conditions and research circumstances would benefit the subregion as a whole and supplement the international bilateral support already referred to.

III. REGIONAL CO-OPERATION IN AGRICULTURAL RESEARCH

Regional technical co-operation is not a new concept to the Caribbean. The Sugar Cane Breeding Centre which has been operating in Barbados since 1932; the Windward Islands Banana Research Scheme which is located in Saint Lucia; the Regional Research Centre of the University of the West Indies (UWI) and its successor organization - the Caribbean Agricultural Research and Development Institute (CARDI) are examples of co-operative efforts in agricultural research. An attempt was also made to establish co-operation in citrus research but this programme was short-lived. Nevertheless, national research programme directors recognize the need to strengthen mechanisms for sharing research capability within the Caribbean as well as

to develop more effective means for assimilating technology that is available from outside of the region.

The programme which is proposed in this document will strengthen technical co-operation in agriculture between the participating countries through advisory services to be rendered by national specialists; the interchange and dissemination of knowledge acquired by national institutions; and the advice of researchers attached to the international agencies and research centres whose work is relevant to the needs of the Caribbean. Specific attention will be given to the development of the human resource and the technical capability to address the agricultural research and development needs of the commodities included in the networking activities. Consequently, the project activities will seek to enhance the technical capability of qualified nationals by means of technical meetings and seminars, short courses and in-service training at centres or institutions mainly in the sub-region. A noteworthy component of the programme is the proposed support for research to be conducted in some of the countries where, in view of the professional and technical capability and facilities available for specific lines of investigation, results applicable to all the countries may be expected as a consequence of this additional support. Also, some of the research programmes will need to be fortified through selective support to meet specific research needs.

Experience gained in a number of other co-operative agricultural research networks in Central and South America has provided a sound basis for developing essential criteria in the design and execution of networks and in defining the nature of the benefits that can be expected by the participating countries. The IDB Project ATN/SF-1586-RE entitled "Co-operative Agricultural Research Programme in Countries of the Southern Cone" has achieved several significant results among which are:

- (i) Strengthening of national research programmes in the specific commodities included in the programme;
- (ii) A general uplifting of morale of research staff;
- (iii) Increased exchange of genetic material;
- (iv) Improvement in design and analysis of research programmes; and

(v) Strengthened linkages with the International Agricultural Research Centres.

Another regional co-operative agricultural research project which has had good results is the Programa Co-operativa de Papa (PRECODEPA) in Mexico and Central America.

An analysis of the reviews of these programmes indicate that networking has facilitated the process whereby technical knowledge acquired by research institutions is disseminated among the participating countries and has encouraged the investigation of local problems through joint national effort. These programmes have surpassed the expectations of the participating national institutions and have promoted co-operation between professionals in different countries, directly and indirectly benefiting research undertaken by the countries.

In contrast with traditional bilateral and regional projects, the co-operative programme favours the definition by national institutions of the form and timing of technical co-operation based on specific needs common to the countries involved. In this respect it is the researchers themselves who, as a result of meetings for purposes of co-ordination, determine the research to be carried out and the manner of execution within the framework of the activities described in the project. This procedure also helps to ensure that the research activities are in harmony with national development perspectives.

To improve the research capacity of the CDCC countries, the present proposal would aim to:

(i) Share responsibilities for research of common interest, attract resources for agricultural research and help to develop a cadre of high level professionals in the participating countries;

(ii) Allow for the continuous appraisal of research needs and identification of problems of a subregional character that would justify sub-regional research, thereby making maximum use of existing resources to the benefit of the countries involved;

(iii) Provide a mechanism for the exchange of ideas, methodologies and techniques between representatives of the countries and with the international research centres, enabling the latter to perfect their programmes for the benefit of the participating countries; and

(iv) Provide a forum for discussion, evaluation, exchanges and indeed recognition of the research carried out by scientists in the CDCC countries.

This programme will also facilitate and promote the work which international agricultural research centres carry out in the Caribbean by helping to define more clearly, areas in which the centres can provide advisory services to national researchers. The dissemination of technology generated by the centres would at the same time help to identify national research priorities. The increased consultations with the centres would facilitate feedback, the introduction of Caribbean priorities into the centres' programmes, and facilitate delivery of support services from the centres to the Caribbean.

IV. NATIONAL FOCAL POINTS FOR AGRICULTURAL RESEARCH

All member countries of the CDCC may participate in the networking programme. Therefore the executors of the programme will be among the following national institutions entrusted with agricultural research in the participating countries:

- (a) Antigua and Barbuda Ministry of Agriculture, Lands and Fisheries;
- (b) Commonwealth of the Bahamas, Ministry of Agriculture;
- (c) Barbados Ministry of Agriculture, Food and Consumer Affairs;
- (d) Belize Ministry of Natural Resources;
- (e) British Virgin Islands, Department of Agriculture;
- (f) Cuba Ministry of Agriculture;
- (g) Commonwealth of Dominica Ministry of Agriculture;
- (h) Dominican Republic State Secretariat for Agriculture;
- (i) Grenada Ministry of Agriculture;
- (j) Guyana National Agricultural Research Institute;
- (k) Haiti Ministry of Agriculture;
- (l) Jamaica Ministry of Agriculture;
- (m) Montserrat Ministry of Agriculture;
- (n) Netherlands Antilles Ministry of Economic Affairs;

- (o) Saint Christopher/Nevis Ministry of Agriculture;
- (p) Saint Lucia Ministry of Agriculture;
- (q) Saint Vincent and the Grenadines Ministry of Agriculture;
- (r) Suriname Ministry of Agriculture;
- (s) Trinidad and Tobago Ministry of Agriculture, Lands and Food Production;
- (t) U.S. Virgin Islands, Department of Agriculture.

V. OBJECTIVES

A. Overall Objective

The overall objective of the programme is to increase the production and productivity of agricultural commodities essential to nutrition and to the economy of the member countries of the CDCC.

This will be achieved by strengthening national agricultural research capabilities through the establishment of a co-operative agricultural research network among the national research systems of the participating countries.

B. Specific Objectives

The specific objectives of the programme include the following:

- (i) To generate technology in the basic food products included in the programme;
- (ii) To set up mechanisms for horizontal technical co-operation between CDCC countries in order to make better use of the technology and resources available for the products considered in the programme;
- (iii) To improve the scientific proficiency of the human resources employed in research and technology transfer of the products considered in the programme;
- (iv) To establish links to facilitate the national agricultural research centres acquiring and using relevant technology developed by the international centres;

(v) To provide training for nationals of the participating countries in order to meet national needs provided such training falls within the agreed framework of the programme.

It is expected that the smaller islands which comprise the Organization of Eastern Caribbean States will derive particular benefits in terms of technical training, specialist expertise made available through the TCDC programmes, and access to backup services which are required on a limited basis but not presently available in those islands.

The larger participating countries will benefit from the better organized linkages with the international agricultural research centres whose assistance in areas such as in-service training, the supply of improved genetic material and the development of focal points in some of these countries which will receive such material from the centres for evaluation and subsequent distribution to other participating countries.

The research institutions which serve groups of islands will find that the network will facilitate their delivery of technical assistance and support services by virtue of improved communications and linkages specific to the agricultural sector.

The network will facilitate the establishment of stronger linkages and functional co-operation between the research units of the ministries of agriculture, between commodity organizations with common interests and also inter-linkages with the regional institutions. This is expected to reduce duplication, extend the geographic area over which scarce technical expertise is applied.

C. Strategies to realize the objectives

The strategy is to develop mechanisms to facilitate the progressive development of strong horizontal co-operation programmes between the national institutions of member countries of the CDCC. The development of such programmes will in turn facilitate the support of international agencies to the agricultural research effort of the subregion.

The co-operative programme will be based on the research carried out by national and regional agricultural research systems, but will be limited to specific commodities and defined activities. The limitations will avoid duplication and allow for the concentration of efforts necessary to build strong programmes which can impact on development and evolve into self-sustaining activities.

Recognizing that the lack of financial resources in the Caribbean impose constraints on implementation, the programme will be financed in the initial stages partly by funding agencies and partly by the countries involved.

National counterpart contributions will be made mostly through the allocation of scientists' time, facilities and services. This will not only reduce the financial demands on the countries but will promote the maximum involvement of national scientists in the programme. Such involvement, plus the training opportunities to be provided by the programme and the development of stronger links with the international centres will all contribute toward strengthening national agricultural research capability.

The programme will give particular attention to the transfer of technology by providing effective mechanisms for such transfer among research scientists in national centres.

D. Output

The networking activities will contribute to the agricultural research capability and to the increased production of specified commodities in the participating countries. In particular, the network will help to ensure:

- (i) Better organized research programmes for those commodities included in the network with specific objectives and output goals;
- (ii) Improvements in the technical capability of the national agricultural research systems through training, backup specialist services, information and increased consultations between researchers;
- (iii) Increased production, higher productivity and quality of specific commodities resulting from the identification and distribution of improved genetic material, the development of improved technology and the transfer of technology to the production sector;

(iv) Establishment of functional co-operation linkages in agriculture between CDBO countries involving, among other things, the research and development of important food commodities; the exchange of information with particular reference to indigenous material; the exchange of superior genetic material and the sharing of scarce technical expertise;

(v) Stronger links between the international research centres and the national research systems thus facilitating increased support from the centres.

VI. DESCRIPTION OF ACTIVITIES

A. Conceptual Framework

The Caribbean countries possess some infrastructural facilities, availability of financial resources and a cadre of scientific personnel devoted to agricultural research. The national systems which include government departments, national agencies and institutions and also private sector organizations carry out a wide range of activities with varying degrees of scientific competence. There are also subregional institutions and research activities supported by groups of countries which share similar problems or common objectives. As a result technology has been developed, information has been generated and experience gained which are valuable but which have not been sufficiently disseminated.

The proposed co-operative programme is designed to have a catalytic effect on national agricultural research systems by providing some institutional support for research activities in clearly defined areas; facilitating the exchange of information and experiences between research personnel, strengthening national systems by increasing the skills and available personnel and promoting the transfer of technology to the producing sector.

B. Programme Activities

Activities to be undertaken within the framework of this programme can be divided initially into two broad areas: research and development, including community research; and strengthening national agricultural research systems.

(i) Research and Development

- (a) Scientific research and the development of new technology;
- (b) Technical co-operation;
- (c) Advisory services; and
- (d) Transfer of Technology.

Scientific Research and the Development of New Technology

Research activities will include the collection, exchange and evaluation of genetic material to improve the pool of genetic material for the purpose of selecting new and more productive cultures.

Efforts will be made to develop improved production techniques for the management of crops on specific soils, the control of pests and diseases and the application of technology for efficient integrated production systems taking into account local conditions and economic factors.

The specific research activities, the focal point(s), the countries taking part in particular commodity research and also the responsibilities of each participating country will be determined during the preparatory phase of the networking programme.

Commodities

The commodities^{5/} to be included in the programme are:

- (i) Tropical Root and Tuber Crops - cassava, sweet potato and yams are currently major commodities, however, potatoes and aroids are also important to a number of Caribbean countries;
- (ii) Grain Legumes with emphasis on Phaseolus, Vigna and soya;^{6/}
- (iii) Vegetable crops with priority being given initially to Allium Spp.

^{5/} A separate project for co-operation in rice research in CDCC countries has been prepared. The Directors of Agricultural Research have recommended that the rice project should be incorporated into the network as a commodity programme when network is established and functioning.

^{6/} A collection of pigeon pea germplasm is being built up in the subregion as a component of a co-operation project in which some CDCC countries are participating. The network will co-operate with and draw upon the resources of this project but will include this commodity in its work programme only as a necessary and complementary activity.

(iv) Livestock development with emphasis on grasses and legumes which are adaptable and productive under specific ecological conditions; the development of pasture management systems and ruminant nutrition.

Criteria used for selection of the commodities included:

(i) The level of production and their importance in the food supply of the subregion;

(ii) Potential for increasing production of commodities which are imported in large quantities;

(iii) Commonality of research needs, existing research programmes and apparent scope for improvement in production efficiency; and

(iv) The need to complement and to avoid duplication of ongoing and pipeline programmes.

Supporting information is included in Annex I, II and III.

Reciprocal Technical Co-operation

Reciprocal technical co-operation will be implemented through activities involving meetings and seminars, the exchange of scientific information and exchange visits.

The persons who will participate in such activities include:

(i) Directors of Research who are responsible for programming and follow-up work in their respective countries;

(ii) Professional staff attached to research institutions in participating countries and who are carrying out relevant research;

(iii) Commodity research leaders in the network;

(iv) Sub-professionals involved in the development of improved production systems.

(v) Specialists who are involved with the network activities;

The activities envisaged will include:

(i) Meetings of national commodity research leaders to discuss and evaluate research projects and results;

(ii) Seminars on specific problems to be attended by national and regional specialists;

(iii) Technical meetings to examine specific commodity research problems to be attended by specialists from participating countries, from regional and international research centres and other international specialists when their participation is considered to be appropriate.

(iv) Exchange visits of professionals engaged in complementary research; and

(v) Exchange visits and assignments of persons responsible for the evaluation and dissemination of research and development results.

Specific research problems related to commodities will be examined at technical meetings attended by specialists from the participating countries, from the international research centres and other international specialists when their participation is considered to be appropriate. At these meetings problems common to the participating countries, for example varietal improvement, crop protection, cultivation methods, field research methodology, the defining of priorities and appraisal of research results will be discussed. The technical meetings will also provide opportunities for exchange of information and experiences, enable visiting specialists to observe ongoing work, to obtain direct information of achievements in the country visited and also to discuss and pass on information concerning their own experiences. In any one year, participation in such meetings will be limited to one professional per country working on each commodity.

The venue for technical meetings will preferably be in those countries with greater expertise and experience in the particular commodity so that on-the-spot information concerning new methods, techniques, verification of results and execution of research will be provided by interchanges between local and visiting researchers. In special cases where particular benefits will accrue, the technical meeting could be held at institutions outside of the CDCC subregion.

Advisory Services in Specific Problems

The participating countries are currently carrying out some research in the commodities considered. The progress of research is sometimes limited by a number of factors including lack of specialist staff, lack of facilities at institutions, problems in research methodology and shortage of support staff.

These problems cannot always be resolved solely by the countries' research staff; they may require the support of specialists to solve specific problems and modest resources to secure equipment and materials for special uses. The services of these specialists may be obtained from international and regional centres and the programmes will provide for this. The programme will also consider the engagement of international scientists with specialist knowledge and experience if this expertise is not available in the region or from the international centres.

Whenever possible, national specialists will be used to assist, on a TCDC basis, with problems being experienced by other participating countries. The duration of such assignments will usually be limited to short-term attachments.

Technology Transfer

In general, the Caribbean lacks effective programmes for the transfer of technology from research and development programmes to the production sector. As long as this problem remains, progress in food production and national agricultural development will be disappointingly slow and the many frustrations of the policy-makers, the research and extension workers and of the farmers, will continue.

With few exceptions, research and extension are being carried out as separate entities in the Caribbean although research, technology evaluation and technology transfer are integral components of one system.

The function of technology evaluation and transfer relates to the socio-economic and technical evaluation of technologies designed for specific communities. This function includes technology packaging and assessment of the possible impact on the farming, marketing and consuming sectors of the community, before delivery of the technology to the potential users. This component requires a considerable measure of collaboration between socio-economic and technology professionals as well as strong contact with all sectors of the agricultural community. This area of work should draw heavily on the findings of the basic social science research in economics, sociology, geography and anthropology in order to understand the possible impact of applied technology. Consequently, particular attention will be given to the development of close

links between the research and extension components of the commodity programmes and to the development of a strong technology transfer programme as a component of the network.

An efficient documentation and communication system is essential for the successful operation of a horizontal co-operation programme; and of any technology transfer activity. Consequently, the programme will provide for the recruitment of a regional communication specialist to work full-time on the programme. The specialist will collaborate with national commodity leaders concerning dissemination of information at the national level and also between institutions.

(ii) Strengthening National Agricultural Research Systems

The specific measures which will be taken to strengthen national agricultural research systems are:

- (a) Support to increase the capability of national systems;
- (b) Training, etc.

Increasing the Capability of National Agricultural Research Systems

The organization of commodity research, increased flow of relevant technical information and the execution of the various research activities in a complementary manner will help to increase the efficiency of the national systems. Programme support in terms of advisory services, short-term technical assistance, materials and equipment and creating a framework to focus research effort for the more effective use of scarce resources will also have the effect of strengthening national research capability.

The development of links throughout the CDCC countries in the proposed horizontal co-operation programme will help to overcome some of the perceived limitations in national agricultural research capability. This will be achieved by developing more effective communications between researchers, the sharing of technical capabilities and results obtained by national research efforts. The very act of providing a mechanism for regular communications will help to improve efficiency and to raise the quality and quantity of research output.

Training

The Directors of Agricultural Research placed a high level of priority on training and recommended that a training component should be included in each of the major programme areas of the networking activities. The objective of the training component is to strengthen national research capability by improving research skills, research management capability and the competence of those concerned with technology transfer and with development.

University and intermediate level technical training are provided by various national and subregional institutions in CDCC countries. Qualified nationals of most countries also have access to scholarships and fellowships funded through bilateral and multilateral programmes for under graduate and specialized post-graduate training. However, short-term training which would enhance the capability of staff to deal with specific research and development problems of important food commodities is not readily available. Consequently, the agricultural research capability of some CDCC countries is constrained by inadequate knowledge of recent advances in techniques developed specifically to improve the production levels of some important tropical food crops.

In order to reduce such constraints, the programme will provide training to professionals and sub-professionals in subject areas relevant to the networking activities. Three types of training are envisaged:

- (i) Short courses;
- (ii) In-service training at national and regional institutions;
- (iii) Fellowships for specialization courses at appropriate institutions.

The short courses will preferably be given in the less developed countries to encourage the maximum attendance of professional and technical personnel of those countries. Selected persons from other countries will also be invited to participate. These courses will be conducted by national specialists, international staff serving on the programmes, staff of Caribbean and international organizations or others engaged to assist with the specific training course.

In-service training will normally be carried out by Caribbean institutions. However, when necessary, selected persons may be given additional

training at international research centres or other institutions whose training programmes are particularly suited to the needs of the trainees and of the programme.

Fellowships for specialization may be awarded to professional and technical staff who need specialized training in research methodology, production technology, communication technology and technology transfer in relation to the programme activities.

The emphasis which is placed on training is justified not only in view of the existing need to increase skills; it is expected that as research programmes become better organized and support obtained through the horizontal co-operation activities, a number of young professionals and technicians will be recruited to the national research establishments. These persons will need to be trained to achieve a desired level of agricultural research capability in the CDCC countries.

VII. ORGANIZATION AND EXECUTION

A. Organizational Structure

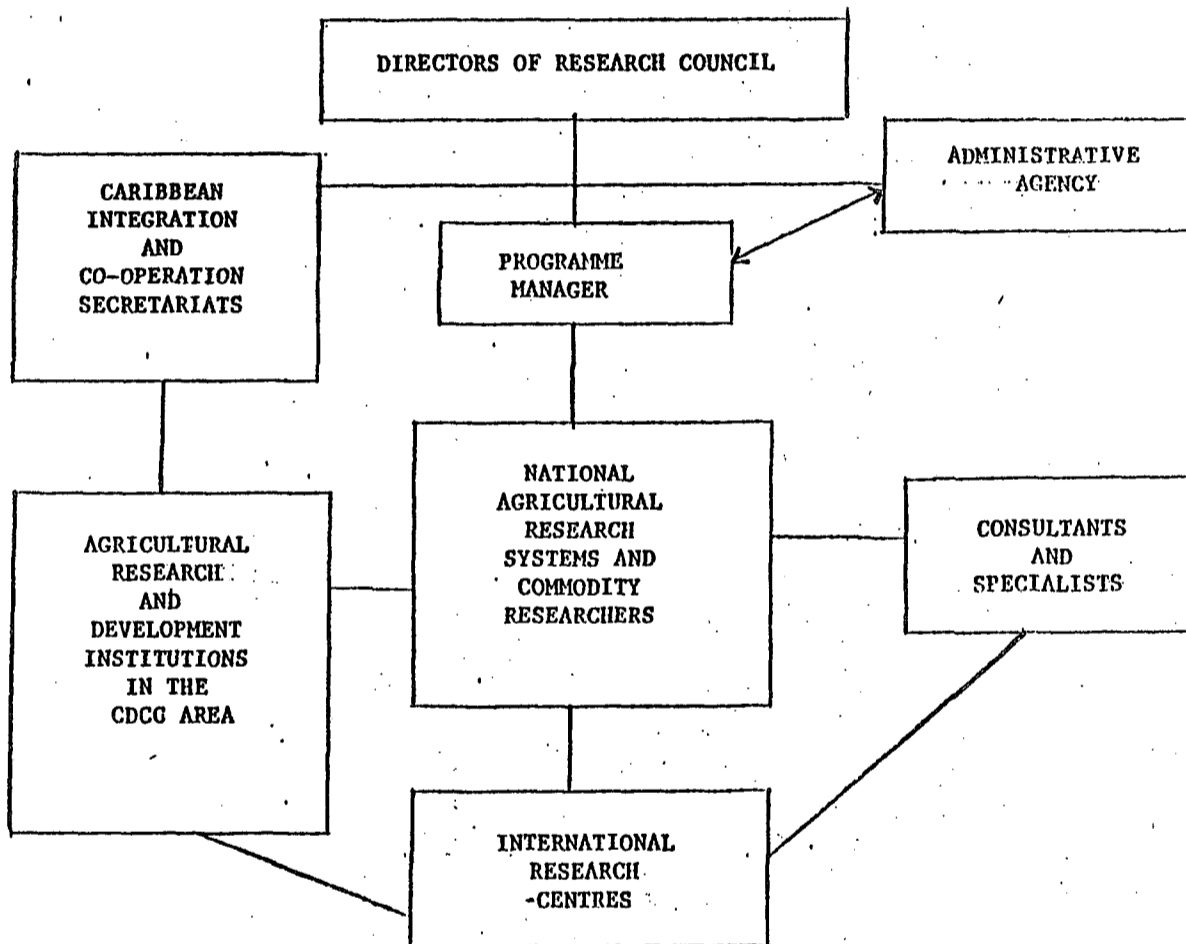
The organizational structure of the network (Chart 1) will consist of the Research Directors' Council, the Programme Manager, the National Commodity Researchers, the International Specialists and the Administrative Agency. Relevant International Agricultural Research Centres will provide support and technical backup in their areas of competence. Caribbean integration secretariats, viz. the CDCC, CARICOM and OECS Secretariats will provide the necessary regional framework within which the network will function.

The Research Directors' Council

The execution of the Programme will be entrusted to a Council comprised of the National Directors of Agricultural Research or the most senior Ministry official responsible for agricultural research policy of the participating countries. The Council will be organized within the first three months of the preparatory phase. Each Director of Research will be the link between the network and the agricultural authorities of the participating countries.

CHART I

ORGANIZATIONAL STRUCTURE OF THE NETWORK



The duties and responsibilities of the Research Directors' Council will include:

- (i) To provide guidelines for the execution of the programme in accordance with the established objectives of the network;
- (ii) To approve the scope and areas of activities to be included in the programme;
- (iii) To approve the selection criteria and terms of reference of the Project Manager and Specialists required by the programme;
- (iv) To select, in consultation and with advice of the Administrative Agency, the Programme Manager and long-term specialists for the programme;
- (v) To approve the selection of network commodity research leaders;
- (vi) To consider and approve the long-term work programme, annual work plans, budgets and programme reports;
- (vii) To monitor the programme, make necessary decisions and ensure that such decisions are implemented in order to realize the needs of the participating countries within the objectives of the programme;
- (viii) To consider and take necessary action concerning the future of the programme.

The Council will draw up procedures for its functioning and will normally meet twice each year. It is expected that the administrative agency and the donor agency (or agencies) will attend these meetings. The international agencies and agricultural research centres operating in Latin America and the Caribbean, with programmes appropriate to the network, the Economic Commission for Latin America and the Caribbean (ECLAC), Sub-regional Headquarters for the Caribbean in its capacity as the CDCC Secretariat, the United Nations Food and Agriculture Organization (FAO), the Inter-American Institute for Co-operation on Agriculture (IICA), the Caribbean Community Secretariat (CARICOM), the Secretariat of the Organization of Eastern Caribbean States (OECS), the Caribbean Agricultural Research and Development Institute (CARDI), the University of the West Indies, Faculty of Agriculture (UWI), the Instituto Superior de Agricultura (ISA) of the Dominican Republic and other co-operating agencies in the subregion may be invited to the Council meetings as observers. The Council may invite to these meetings any persons considered relevant to the performance of its functions and determine the conditions governing their participation.

Administrative Agency

The Administrative Agency will be an existing institution with experience in co-operation programmes in the Caribbean. The Administrative Agency will be responsible to the Directors of Research for the administration of the programme and must have the capability to deal effectively with all countries which participate in the networking activities.

The Programme Manager

The Programme Manager will be responsible for the execution of the networking activities and will provide the link between the Council and the operational components of the network system. He/she will be the chief executive for the programme, will be contracted on a full-time basis, paid from programme funds and will be responsible to the Council with respect to his/her executive functions.

The duties of the Programme Manager subject to any rules drawn up by the Council should include the following:

- (i) To carry out the decisions of the Council;
- (ii) To act as Secretary to the Council and prepare documents and reports as required by the programme;
- (iii) To manage the activities of the programme;
- (iv) To draw up the long term and annual work programmes, budgets and programme reports with the collaboration of the commodity research leaders and product specialists;
- (v) In consultation with commodity research leaders draw up the terms of reference, receive applications and propose candidates for the Specialists employed in the programme;
- (vi) To supervise and monitor programme activities; identify and take, or when necessary, propose to the Council, measures to solve problems and optimize programme activities;
- (vii) To control the programme budget and expenses and ensure efficient financial management in accordance with the provisions and requirements of the programme;

(viii) To provide liaison between the various components of the programme and with international institutions;

(ix) To carry out other duties as may from time to time be decided by the Council.

The Commodity Research Leaders

The national commodity researchers will nominate one of their members as the national leader. The national leaders will then select the network Commodity Research Leader from among themselves. The national authorities will be asked to allow that person to carry out functions specific to the networking system while continuing to function within the national system.

The Commodity Research Leader will therefore continue as a national employee with responsibilities within the national research system. It is recognized that the additional responsibilities will make important demands on the scientist's time. In exceptional cases, the network may provide support services so that the Commodity Research Leader can carry out effectively, both the national and the networking responsibilities.

The duties and responsibilities of the Commodity Research Leader in the regional network programme will include:

(i) To provide leadership, and be the focal point for the research activities related to the particular commodity;

(ii) With the co-operation of the national researchers and the relevant international specialists, recommend annual work plans and help to ensure that the objectives of the commodity programme are realized;

(iii) Maintain effective liaison with commodity researchers both within and outside the subregion;

(iv) Advise the Programme Manager on matters relating to the commodity research programme.

The International Specialists

The international specialists will be recruited from the Caribbean and also from other areas where necessary. However, recruitment within the subregion must not be such as to weaken the national research systems.

The international specialists will be paid from programme funds, they will work full time on the programme in support of networking activities in those areas in which expertise is not available in the national systems.

Their duties will be:

- (i) To execute the programme activities in co-ordination and in co-operation with the national and subregional agencies;
- (ii) To give support in specific areas to activities carried out by national entities within the framework of the programme;
- (iii) To carry out activities as determined by the Programme Manager in consultation with the Commodity Research Leaders.

The International Research Centres

The International Agricultural Research Centres which have been established by the CGIAR and now have programmes in the Caribbean constitute a major resource which can contribute much to the networking programme.

Three of the centres, the International Institute for Tropical Agriculture (IITA), the International Centre for Tropical Agriculture (CIAT) and the International Potato Centre (CIP) have already given support during the preparatory assistance phase of the network. The International Service for National Agricultural Research (ISNAR) and the International Maize and Wheat Improvement Centre (CIMMYT) have also indicated interest in assisting the network.

The centres will support research on the commodities/disciplines which are included in the mandate of the respective centres. Staff will visit the subregion as advisers to assist with research problems and in training activities. The centres will supply, free of charge, small quantities of pathogen-tested germplasm from improved selections, available publications and training materials. Also, arrangements may be made for specialized training of national scientists at the centres.

B. Execution

The programme will extend over a period of three and one half (3-1/2) years in the first instance and will consist of two phases:

- (i) The preparatory phase of six months; and
- (ii) An implementation phase of three years.

The Preparatory Phase

This phase will be devoted to documentation of the activities to be carried out during the implementation phase, indicating the activities to be carried out during each of the three years. During this phase, the detailed annual work plan for the first year of operations will be documented.

The document setting out the activities to be carried out during the implementation phase will include:

- (i) The research projects and proposed time schedule;
- (ii) The objectives and the topics for meetings, seminars and training courses with projections of the numbers of participants by country and the duration, location and timing of the activities;
- (iii) A schedule of the exchange visits of national specialists, the countries involved and the proposed times;
- (iv) A summary of acquisitions needed for institutional support;
- (v) A tentative budget for each activity, by year of execution and totals;
- (vi) The nature and amount of the contributions to be made by the participating countries.

The annual work plan will set out the detailed activities for each of the three years, the research plans and schedules, the countries participating in each activity as well as the specifications, value and destination of acquisitions. The annual work plan will also give details of activities carried out during the previous year, the results obtained, the participants by type of activity and the use of both programme and national resources for specific activities.

The Implementation Phase

During this phase, the research and related activities documented during the preparatory phase will be carried out. The phasing of the activities is summarized at Annex V.

VIII. ADMINISTRATION

A. The Administrative Agency

The Administrative Agency will be responsible to the Directors' Council. The main duties and functions of the Administrative Agency will be:

- (i) To provide the necessary administrative services (personnel, equipment and accessories, communication services) and technical support required by the personnel executing the programme in accordance with the corresponding budget allocations;
- (ii) To administer the financial resources of the programme;
- (iii) To prepare and present for consideration by the Research Directors' Council the selection criteria, terms of reference and particulars of candidates for the posts of Programme Manager and International Specialists;
- (iv) To contract the services of the Programme Manager after approval by the Research Directors' Council, and the Donor(s);
- (v) To contract the services of the international specialists;
- (vi) To take part in the meetings of the Research Directors' Council;
- (vii) To submit to the Donor(s) the plans and reports regarding the progress of the project;
- (viii) To see to the provision by the participating countries of the counterparts required in the execution of the project.

The schedule of Administrative Activities is given at Annex IV.

B. The Participating Countries

The participating countries will provide, through their research institutions:

- (i) The Commodity Leaders for the programme;
- (ii) The national specialists to give advisory assistance in specific problems;
- (iii) The professionals required for activities foreseen in the spheres of reciprocal technical co-operation and training;
- (iv) The necessary administrative installations and services for the execution of the programme in the respective countries; and

(v) The support required to carry out advisory activities and for the short term consultants in specific problems.

C. Location of the Programme Headquarters

The location of the programme headquarters will be decided by the Research Directors' Council and the Administrative Agency. The criteria for location will be based on logistical and other factors which will determine the efficient administration of the network. The place of work of the international and short-term specialists will be determined in accordance with the requirements of the programme and the needs of the countries as specified in the work programme.

D. Period of Execution of the Programme

The first six months preparatory phase will be devoted to organizational functions in particular recruitment of the Programme Manager which should be completed within three months from the date of signing the Agreement; preparation of the three-year work programme and the detailed work plan for the first year of operation.

The subsequent three years will be devoted to implementation of the networking activities.

E. Continuity of the Programme

Acting through the Research Directors' Council, the participating countries will be responsible for defining the organization and mechanisms to be adopted in order to impart continuity to the Co-operative Programme with particular reference to financial requirements and with the aim of ensuring that the programme becomes self-sustaining. In this respect, the participating countries will study and determine the necessary mechanisms for the continued financing of the networking activities.

In considering its objectives to stimulate technological development throughout the subregion, the Administrative Agency will take part in the analysis of the suitability and continuation of the programme, and decide on the support it may be able to continue providing.

F. Evaluation

Midway through the period of implementation of the programme, the Research Directors' Council will ensure an evaluation of its execution by independent specialists. The purpose of this evaluation will be to determine the extent of progress achieved compared with the objectives and the budget as set out in this proposal and in the 3-year work programme. The evaluation report will comment on results achieved and put forward recommendations regarding action required and activities to be undertaken in the remaining period of execution of the programme. These recommendations will be incorporated in the programme for the remaining 18 months subject to the relevant decision of the Directors' Council.

IX. JUSTIFICATION

Some reasons which justify the establishment of a network have been given the preceding sections. In general, the agricultural sector has not kept pace with the increasing demand for food. The decline in the volume and real value of traditional export crops have reduced the foreign exchange earnings previously available for the purchase of imported food commodities. Consequently, the food security status of some Caribbean countries have been reduced. There is growing concern that early action must be taken to increase food production and to establish an adequate agricultural research and development capability to support production efforts.

The CDCC countries as a whole, possess a significant number of agricultural scientists but there is considerable variability between countries with respect to the scope of research programmes and the complement of staff with skills relevant to a particular commodity or disciplinary area (see Annex VII). The horizontal co-operation programme set out in this proposal is considered to be a practical system which is compatible with the needs of the CDCC countries and is also compatible with the existing institutional and organizational systems which have been established in these countries.

Co-operation between CDCC research institutions offers a wide range of possibilities in terms of finding solutions to common problems, and the wider

use of information, methodologies, experiences and materials not adequately employed in all of the countries involved.

By concentrating on research and the exchange of information and experiences, the programme will also be a mechanism for the transfer of technology and the extension of knowledge throughout the agricultural research community of the Caribbean.

To sum up, the programme finds justification through the benefits obtainable from mobilization of knowledge, experience and resources in agricultural research. The national research systems are unable to initiate the required action through individual effort and need the support of donors at this time.

The terms of reference and candidates for the above evaluation will be submitted by the Administrative Agency to the Directors' Council for approval after consultation with the Programme Manager, the technical team and the Donor(s). The programme envisages a total of two international specialists/months to carry out this task.

X. COSTS AND FINANCING

The total cost of the networking programme will be determined during the preparatory phase. The estimated donor support required during the initial 3-year operational phase is US\$2.7 million as shown in the indicative budget at Annex VI.

The indicative budget indicates the emphasis placed on technical co-operation activities, training and technology transfer. It is recognized that these three sub-programmes will include a number of interrelated activities with a common element of technology transfer. This interrelationship will, however, serve to strengthen the network.

The budget line for TCDC activities is intended to finance, in part, the costs of assigning nationals on short-term technical co-operation missions to other countries.

The technology transfer allocation will meet the cost of professional services and programme activities carried out by a communications specialist.

The allocation for commodity research and development will be used to supply materials and specific equipment which may not be available, but required for use in networking programmes; to facilitate the procurement of genetic materials; for the production and distribution of desirable cultivars and other materials identified in the networking programme and to provide other necessary research inputs. This allocation is most important for the success of the commodity research programmes since most CDCC countries currently experience severe constraints with respect to the purchase of materials and equipment the majority of which require foreign exchange.

The cost equivalent contribution of the individual countries will be determined during the preparatory phase and will be based on:

(i) The salaries of specialists and others who participate in networking research activities, in technical assistance missions, seminars, short courses and in-service training;

(ii) Local travel and other costs incurred by nationals taking part in programme activities within their own countries;

(iii) Facilities, equipment and services necessary to carry out the programme activities in their own countries;

(iv) Logistical support required by international and visiting specialists to carry out their functions.

The Administrative Agency will provide backup administrative and technical services in support of the programme; the extent and cost equivalent of these services will be determined during the preparatory phase.

It is anticipated that the International Agricultural Research Centres serving the subregion will support the research and production technology training in the commodities included in their respective mandates.

XI. REPORTS

With the prior approval of the Research Directors' Council, the Administrative Agency will present to the Donor(s) the following reports:

(i) The 3-year Programme and the First Annual Work Plan, within a period of six months from the date of signature of an agreement between the Donor(s), the Administrative Agency and the Participating Countries approving implementation of the network.

(ii) The Annual Work Plans for the second and third years of execution of the programme, one month before the beginning of the corresponding period;

(iii) Research plans, together with a detail of the acquisition of equipment and materials, within the first year as from the date of signature of the agreement;

(iv) Six monthly progress reports, within a period of 30 days immediately following the end of the corresponding semester. These reports should contain, among other items, the following:

(a) Details of the activities carried out in the period, including a description of each, their dates and location of execution, names and institutional origins of the participants, results obtained and follow-up action proposed;

(b) A detail of acquisitions made during the period;

(c) An estimate of expenses incurred against each budget item; and

(d) Activities to be undertaken in the following six months.

(v) Annual financial reports within the three months immediately following the end of the corresponding budget year;

(vi) The report of the mid-term evaluation, two months prior to the start of execution of the third year of the programme;

(vii) A final report to be drawn up by the technical team of the programme containing a description of activities and results achieved at the date of termination of the programme.

(viii) An evaluation report on the programme, to be prepared by each of the national institutions taking part, within a three month period following the final date of execution; and

(ix) A terminal financial report within three months of the date of termination of the programme, justifying expenditure incurred and charged to the contribution of the donor(s), and duly revised by external auditors to the satisfaction of the donor(s). In addition to the foregoing, this report will contain details of the amounts contributed by each of the countries taking part in the programme.

XII. MONITORING

Execution of the programme would be monitored in accordance with modalities determined in consultation with the Research Directors' Council, the Administrative Agency and the Donor(s).

XIII. EVALUATION CRITERIA

On completion of execution of the project, the Donor(s) acting in co-operation with participating national institutions, will carry out an evaluation of the programme based on work done and reports submitted, bearing in mind, among other considerations, the following criteria:

- (i) Any increase noted in the degree of co-operation in agricultural research between the participating countries;
- (ii) The degree of execution of the various programme activities, including the various activities being undertaken by trained technical specialists; the participation of professional specialists in the exchange programme, meetings, seminars and advisory services and the current situation in the execution of research activities in the countries;
- (iii) Resources in terms of manpower, infrastructure and financing channelled towards agricultural research in the participating countries in response to the programme activities;
- (iv) Any increase in the degree of co-operation in research and training activities between national institutions in the participating countries and the international centres;
- (v) The form adopted for continuation of the programme by the institutions involved.

Annex I

ACREAGE AND PRODUCTION OF SELECTED AGRICULTURAL
COMMODITIES IN THE CDCC COUNTRIES (1982)

Country	Root Crops		Grain and Legumes Prod. MT	Vegetables incl. Onions		Rice		Pastures Area ha.
	Area ha	Prod. MT		Area ha.	Prod. MT	Area ha.	Prod. MT	
Antigua and Barbuda	160	670	24	55	1069	-	-	4860
Bahamas	24	254	117	40	11416	-	-	1817
Barbados	304	8800	533	967	8572	-	-	550
Belize			1542	-		2349	4128	26163
Cuba	80000	867000	12700	2000	345600	150000	518000	3070000
Dominica	...	25323	-	-	4326	-	-	641
Dominican Republic	23000	155000	50000	1000	246000	120000	496000	1520000
Grenada	...	1242	635	6	375	-	-	3000
Guyana	...	24947	967	44	4000	76000	247000	593973
Haiti	135000	665000	50000	2000	21000	50000	95000	506000
Jamaica	4000	198593	9577	2000	93972	868	3387	124396
Montserrat	90	195	36	5	175	-	-	2856
Netherlands Antilles	...	312	-	-	-	-	-	8
Saint Christopher/Nevis	...	1100	20	...	199	-	-	3709
Saint Lucia	...	1585	...	...	689	-	-	2975
Saint Vincent and the Grenadines	1000	10003	30	...	1138	-	-	1921
Suriname	1430	3450	925	50	2405	72000	262000	21000
Trinidad and Tobago	208	8321	3968	215	14313	5000	17000	5556
Totals	244216 ^{1/}	1971795 ^{2/}	131074	8382	755249	416217	1642515	5889425

^{1/} Except Belize, Dominica, Grenada, Guyana, Netherlands Antilles, Saint Christopher/Nevis, Saint Lucia.

^{2/} Except Belize.

Source: Agricultural Statistics: Caribbean Countries Vol. VI, 1984 LC/CAR/G.132.

Annex II

IMPORTS OF SELECTED AGRICULTURAL COMMODITIES INTO CDCC COUNTRIES
(1982)

Country	Onions		Legumes		Meat and Meat Products						Dairy Products ^{1/}	
	Vol. MT	Val. US\$'000	Vol. MT	Val. US\$'000	Meat Fresh, etc.		Processed		Canned etc.		Vol. MT	Val. US\$'000
					Vol. MT	Val. US\$'000	Vol. MT	Val. US\$'000	Vol. MT	Val. US\$'000		
Antigua and Barbuda	240	150	65	84	1292	2130	165	510	150	420	1252	1252
Bahamas	350	130	200	200	5970	13870	1050	2520	1600	4700	5050	5050
Barbados	1733	602	1300	1000	6619	11463	1940	2848	1070	2481	1441	1441
Belize	861	678	205	206	586	605	588	822	756	1764	5986	5986
Cuba	8023	1689	119176	54557	22755	30266	...	...	47191	89143	41915	41915
Dominica	120	52	220	180	1275	1507	10	40	230	405	1300	1300
Dominican Republic	4	38	84	15	10425	11443	455	362	14	18	7238	7238
Grenada	268	137	162	108	2207	1875	249	564	205	439	2515	2515
Guyana	-	-	3635	2428	20	20	...	...	4	10	8048	8048
Haiti	...	...	600	360	800	1250	...	...	160	425	12180	12180
Jamaica	1100	440	500	450	32150	19300	910	1155	5710	16290	13000	13000
Montserrat	60	31	...	...	382	461	30	62	41	120	449	449
Netherlands Antilles	1300	600	400	440	17050	32950	920	2250	2600	7000	14300	14300
Saint Christopher/Nevis	190	95	90	80	1105	1140	195	310	95	250	992	992
Saint Lucia	428	210	445	499	4202	4799	226	464	285	763	2256	2256
Saint Vincent + the Grenadines	242	107	192	157	510	1225	16	62	312	789	839	839
Suriname	2000	800	2700	1800	441	460	1100	1700	1000	1200	1650	1650
Trinidad and Tobago	6598	2798	12078	8336	15246	38036	2922	4431	2878	7742	34381	34381
Totals	23517	8557	142052	70900	123035	172800	10776	18100	64307	133959	154792	154792

^{1/} Refers to milk and cream only.

Source: FAO Trade Yearbook 1983. Data for 1982 imports.

... Not available.

Annex III

COUNTRIES WITH ACTIVE COMMODITY RESEARCH
PROGRAMMES RELEVANT TO NETWORKING ACTIV-
ITIES

Country	Root Crops	Grain Legumes	Onions	Vege- tables	Pas- tures	Rice
Antigua and Barbuda	x	x			x	
Bahamas	x	x	x	x	x	
Barbados	x	(x)	x	x	x	
Belize		x	x		x	x
British Virgin Islands						
Cuba	x	x		x	x	x
Dominica	x			(x)		
Dominican Republic	x	x	x	x	x	x
Grenada						
Guyana	(x)	x				x
Haiti	x	x	x	x	x	x
Jamaica	x	x	x	x	x	x
Montserrat						
Netherlands Antilles				x	(x)	
Saint Christopher/Nevis	(x)	x	x	x		
Saint Lucia	x	(x)		x	(x)	
Saint Vincent and the Grenadines	x	(x)				
Suriname						x
Trinidad and Tobago	x	x	(x)	x	x	x
U.S. Virgin Islands	x	x		x	x	

x major, (x) minor programmes. Ranking based on national priorities.

Annex IV

PROGRAMME OF ADMINISTRATIVE ACTIONS

	<u>Preparatory Phase</u>	<u>Month</u>
1.	Agreement signed.	0
2.	Programme Manager contracted.	3
3.	3-year Work Programme Guideline documented (3 months after item 2).	6
4.	Research Directors Council approve 3-year Work Programme Guideline (within 3 months of item 2).	6
5.	3-year Work Programme Guideline presented to Donor(s) /3-year execution period for the Work Programme calculated from the date on which the Donor(s) approve the Work Programme Guideline/.	6
6.	First Annual Work Plan prepared and submitted con- currently with Work Programme Guideline.	6
	<u>Implementation Phase</u>	
7.	Second and third Annual Work Plans submitted to Donor(s) two months prior to date of implementation.	10, 22
8.	Six monthly Progress Reports submitted within 30 days of the end of each six months period.	7,13,19,25
9.	Annual Financial Reports submitted within 90 days of the end of each financial year.	15,27,39
10.	Mid-term report on accomplishments submitted within 30 days after the first 18 months of operations.	19
11.	Final Report giving details of accomplishments, justification for revisions to programme and ex- penditure, audited financial statements, recom- mendations for future activities presented to Donor(s) within 90 days of the terminal date of the programme.	39

Annex V

PHASING OF ACTIVITIES FOR THE
CARIBBEAN CO-OPERATIVE AGRICULTURAL RESEARCH NETWORK

Activity	M O N T H								
	0	6	12	18	24	30	36	42	48
	Prepar- atory _____ Implementation _____								
1. Signing of Agreement									
2. Inauguration of Research Directors' Council									
3. Appointment of Programme and experts for Phase I									
4. Documentation of 3-year Programme and First Annual Plan									
5. Implementation of Programme									
6. Submission of six-monthly progress reports.									
7. Mid-term Appraisal									
8. Annual Financial Reports									
9. Terminal Report									
10. Report of Financial Audit									

Annex VI

SUMMARY OF INDICATIVE BUDGET - 3 YEARS

1.	<u>Programme</u>	US\$
	Research Directors' Council	60,000
	Programme Manager	280,000
2.	<u>Research and Development</u>	
	Commodity Research, Materials, equipment, etc.	600,000
3.	<u>Horizontal Technical Co-operation</u>	
	Commodity Research Meetings Observation/Exchange Visits	245,000
4.	<u>Advisory Services</u>	
	Short-term consultants	180,000
5.	<u>Training</u>	
	Country short courses Workshops and Seminars In-service Training	680,000
6.	<u>Technology Transfer</u>	250,000
7.	Technical Co-operation (TCDC activities)	120,000
8.	Organizational costs	<u>240,000</u>
		<u>2,655,000</u>

5.	<u>Technology Transfer</u>	US\$
	(i) <u>Communications specialist</u> for 30 months.	150,000
	(ii) <u>Technology Transfer Programmes</u>	100,000
6.	<u>Technical Co-operation (TCDC) Activities</u>	120,000
7.	<u>Organizational costs</u>	
	Materials and operational costs, evaluation missions, documentation, communications, etc.	240,000
		<hr/>
	Total	2,655,000
		<hr/> <hr/>

1/ It is estimated that an average of 10 countries will participate in each commodity programme.

2/ Funding for 9 non-resident participants only.

Bahamas

In 1984 the Bahamas Ministry of Agriculture had a complement of 69 including 15 professional staff members assigned to agricultural research. Approximately one half of the researchers had post-graduate training; 10 are assigned to agronomic and horticultural-related work and the others to animal production, animal nutrition and plant protection.

There are four agricultural research stations which are located on different islands. The main commodity research programmes include root crops; pastures and forage legumes; animal nutrition, including both ruminants and non-ruminants; vegetable production systems; onion production and grain legumes.

On-farm research concentrates on vegetable production systems, plant protection, tropical fruits and livestock production systems.

Barbados

Agricultural research is carried out by the Ministry of Agriculture, which has a modest but far ranging programme in crops and livestock; by the local sugar industry and the West Indies Sugar Cane Breeding Station which is supported by a number of regional and overseas sugar producers. The Caribbean Meteorological Institute which is based in Barbados carries out limited agro-meteorological studies.

The Ministry of Agriculture has 40 research staff; 20 are graduates and 6 have had post-graduate training. Areas of major emphasis include agronomy, plant protection, animal nutrition and soil and water conservation. There are laboratory facilities for soil and water analyses and for animal nutrition studies.

Main crop research programmes include root crops, grain legumes, vegetable crops, grasses and forage legumes as well as fruits.

Barbados has links with IICA, CIAT, CARDI and UWI.

Belize

The agricultural research system in Belize is small and much of the capability rests with private commodity research. The Ministry of Agriculture has six professionals and CARDI three graduate researchers located in Belize.

Research emphasis is placed on sugar cane, rice, corn, oil palm, coconuts, soya bean, grain legumes, onions, forages and livestock; some attention is also given to vegetable crops.

Cuba

In Cuba there has been heavy investment in science and technology inclusive of science for agriculture. Consequently Cuban agricultural research has achieved a high degree of development and sophistication and a number of notable advances in plant and animal science have been reported over the past decade or more.

The agricultural research system has utilized materials and knowledge from the International Agricultural Research Centres and the Global Research Network.

Dominican Republic

In recent years, extensive reorganization of agricultural research has placed all government financed agricultural research within the purview of the National Director of Research. A national plan for agricultural research has been developed and the agricultural experiment stations in the development regions which had been semi-autonomous now constitute the experiment station network of the National Agricultural Service.

The Department of Agricultural Research consists of six main units with specific and defined geographical or product responsibility. They are:

(i) The South Agricultural Development Centre (CESDA) with a multi-product mandate and responsibility in the southern and eastern zones of the country;

(ii) The North Agricultural Development Centre (CENDA) with a multi-crop mandate and responsibility in the northern zone;

(iii) The Rice Research Centre (CEDIA) with a specific mandate in rice at the national level;

(iv) The Cattle Research Centre (CENIP) with a specific mandate in livestock, pastures and fodder, at the national level;

(v) The Centre of Applied Research to Arid Zones (CIAZA) with a specific mandate in arid zone research at the national level, although with concentration on the plains of Azua;

(vi) The National Centre of Appropriate Technology (CENATA) is concerned with appropriate technology especially in the fields of small machinery, equipment and renewable sources of energy.

The Universities are also involved with a wide range of agricultural research activities. The private sector carries out research relating to animal production; various aspects of the production and use of sugar cane; a soils and fertilizer use programme and herbicide use with attention to the transfer of technology and the inter-relationship between researchers and potential users of the research results.

International institutions active in, or giving support to agricultural research in the Dominican Republic include:

- (i) CIAT - rice, legumes, pastures, cassava, training visits of experts;
- (ii) IRRI - genetic improvement of rice, short-term training, visits of experts;
- (iii) CIMMYT - improvement of maize and wheat;
- (iv) CIP - Dominican participation in a Regional Co-operative Potato Programme (PRECODEPA) through which funds and technical support specific to potato are received.

International agencies such as FAO, IICA, USAID and CIDA support various agricultural research and production projects in the Dominican Republic.

The State Department of Agricultural Research has a scientific and technical staff of about 164 of which 140 are graduates. In addition, the Universities' research staff include some 39 professionals with post-graduate qualifications.

In addition to the six main research units there are a number of research stations located throughout the country. Research programmes cover a wide range of disciplines, and crops - cereals, vegetables, root crops, grain legumes, fruits, edible oils, plantain, grasses and forage legumes, animal production, plant protection and irrigation technology.

Guyana

Overall responsibility for agricultural research is assumed by the government. Formulation of Agricultural policy rests with the Ministry of Agriculture. The recently created National Agricultural Research Institute has been given responsibility for the direction and co-ordination of all agricultural research conducted in the country. However, the Sugar Corporation and the Rice Board continue to exert control over some commodity research.

Emphasis is placed on soils research with particular reference to soil characterization, soil fertility, soil management, soil microbiology including nitrogen fixation in rice soils and the efficacy of rhizobium in association with grain legumes. The control of weeds, pests and diseases, agricultural engineering and farm mechanization as well as plant breeding with specific attention to rice are important activities.

The major crop research projects relate to rice, grain legumes, soya bean, roots and tubers, vegetable crops, pasture development and improvement and coconuts. There is one functional analytical laboratory for agronomic and soils related work.

The research staff of the National Agricultural Research Institute include 20 graduates, of whom 13 have post-graduate training.

IICA and CARDI have a small number of research staff based in Guyana, and there are links with CIAT, IRRI and CIMMYT in various aspects of agricultural research.

Haiti

The Ministry of Agriculture, National Resources and Rural Development (DARNDR) is the state agency with responsibility for agricultural research. Within the sector there exists a few semi-autonomous institutions executing development projects with a limited component of applied research. For example, the Faculty of Agronomy and Veterinary Medicine has established an Agricultural Research and Documentation Centre with units for Agricultural Research and for Agricultural Documentation.

The national research staff consist of 38 graduates, of whom 30 have received post-graduate training. National agricultural research priorities include institution building with special attention being given to manpower development, increasing the production and productivity of high-consumption foods with respect to calorie-protein requirements and reducing the existing food deficit.

The principal crop research projects include cereals; grain legumes; roots and tubers; vegetables including onions; edible oil crops; tropical fruits and traditional export crops.

In animal production, emphasis is placed on restocking following the ravages of African Swine Fever and improvements in cattle and goat production. Consequently, animal production systems, pasture development, the conservation and utilization of animal feeds and animal nutrition are important components of the research programme.

The links between research and extension are being strengthened and the development of the documentation unit within the Faculty of Agronomy and Veterinary Medicine is an important mechanism to strengthen that link and to promote transfer of technology to producers.

Jamaica

Agriculture maintains a dominant place in the Jamaican economy and is the major source of income and employment for 50 per cent of the labour force. Since the mid-1970's emphasis has been placed in the re-development and diversification of the agricultural sector and increased dependence on

local production to meet national food requirements. Consequently, the agricultural research services are called upon to support a varied and dynamic production programme.

Under an IDB Loan Agreement, the agricultural research system is undergoing extensive reorganization and major experiment station facilities are being established at two locations. A Research and Development Department is being established within the Ministry of Agriculture. Ultimately, all research activity will be co-ordinated within this framework, although existing commodity research seems likely to continue under the control of the respective commodity boards which operate as statutory bodies and include the Sugar Industry Research Institute, the Coffee Industry Board, the Citrus Growers' Association, the Coconut Industry Board and the Banana Industry Board.

Jamaica has four main research stations: Bodles, which has main responsibility for dairy cattle breeding, husbandry and nutrition, pasture development and some crop research; Grove Place which places emphasis on beef cattle breeding and husbandry, small ruminants and pasture research; Montpellier for dual cattle breeding and husbandry and also pasture research; Orange River which is concerned mainly with crop research. There are also three sub-stations concerned with crop research.

Emphasis is placed on livestock research including breeding of both specialized and dual purpose cattle, the development of productive pastures and management systems and the use of locally produced ingredients in animal feeds. Crop research programmes are concentrated on cereals, grain legumes, vegetable crops, roots and tubers, edible oil crops, spices and tree crops, plant protection and herbicide agronomy are also important activities. The Agricultural Chemistry Division co-operates with the other divisions in analytical-based research.

The Ministry of Agriculture has a research staff of 84. Although 74 are graduates, only 7 have post-graduate research training and of these 7, four devote a part or all of their time to management. Laboratories include facilities for animal nutrition studies, seed quality, entomology and plant pathology.

Suriname

Agricultural research in Suriname is carried out primarily under the aegis of the Ministry of Agriculture, Animal Husbandry and Fisheries, which operates a modest Division of Research. This is supplemented by commodity research undertaken by a number of autonomous units which fall within the overall jurisdiction of the Ministry. In addition the Faculty of Natural Resources of the University of Suriname and the Centre for Agricultural Research complement the work of the Ministry.

Emphasis is placed on rice, oil palm, coconuts and citrus which are the major crops. However, root and tuber crops, vegetables and more recently, pasture development have been included in research programmes.

Trinidad and Tobago

The agricultural research system of the Ministry of Agriculture in Trinidad and Tobago consists of:

- (i) The Central Experiment Station which is concerned with agronomy, plant breeding, crop protection, soil research and plant nutrition, post-harvest physiology of tropical fruits, livestock and forage agronomy and red ring of coconuts;
- (ii) The Chaguaramas Agricultural Development Project which concentrates on plant breeding and production of improved seeds of maize, soya bean, and grain legumes;
- (iii) The research unit of Caroni (1975) Ltd., which gives priority to applied research in soils, agronomy and crop protection of sugar cane, rice, and selected crops (citrus, coffee, grain legumes, root and tuber crops and maize) in support of a crop diversification programme utilizing previous sugar cane lands;
- (iv) The Sugar Cane Feeds Centre which is a specialized projects to utilize sugar cane as the energy feed for meat and milk production;
- (v) The Cocoa Research Unit of the Ministry of Agriculture; and
- (vi) The Coffee Research Unit of the Ministry of Agriculture.

The University of the West Indies' Faculty of Agriculture is located in Trinidad and carries out a number of research programmes some of which complement the programmes of the Ministry. For example the University deals with fundamental research problems of cocoa and coffee while the Ministry deals more with applied research and extension of research findings.

The Headquarters of the Caribbean Agricultural Research and Development Institute (CARDI) is also located in Trinidad and some of its research is carried out in close co-operation with the Ministry.

The manpower and facilities devoted to agricultural research in Trinidad and Tobago are considerable. The Central Experiment Station has a professional staff complement of 50; Caroni (1975) Ltd. 10; the Sugar Cane Feeds Centre 10; and the Chaguaramas Agricultural Development Project 8. Staff of the UWI and CARDI supplement this large pool of expertise, in addition, FAO and IICA and the Commonwealth Institute of Biological Control have staff based in Trinidad.

Organization of Eastern Caribbean States (OECS)

The countries comprising the OECS^{7/} are all small island states with small Ministries of Agriculture, which do not have the capability to mount and sustain research effort adequate to their needs. Where research is undertaken, it is state financed, often supplemented with grant aid and expatriate technical assistance personnel are often important in the research system of these islands. These countries do not have a research policy and there are no organized programmes except those carried out by the banana and sugar industries.

The Windward Islands Banana Growers' Association (WINBAN) provides the core funds and operates a highly effective Research and Development Division which has undertaken research for the benefit of its membership, i.e. the banana growers of Dominica, Grenada, Saint Lucia and Saint Vincent and the Grenadines. Basic research on sugar cane is carried out by the West Indies Sugar Cane Breeding Station in Barbados with complementary applied research at the national level in the sugar producing islands.

^{7/} Antigua and Barbuda, British Virgin Islands, Dominica, Grenada, Montserrat, Saint Christopher/Nevis, Saint Lucia, Saint Vincent and the Grenadines.

Agricultural research staff in the Ministries of Agriculture of the OECS number about 15. However, they are dispersed over six islands and lack the structure, organization and resources to be effective.

IICA has increased its support to agricultural research in the OECS and there is continuing inputs from FAO in several islands.

The OECS rely heavily on CARDI for their national agricultural research needs. Resource constraints have limited the ability of CARDI to provide the research service desired by all of the countries which it serves.

Emphasis is placed on production systems and the evaluation of varieties in specific ecosystems, plant protection requirements and planting density. Most of this applied research is concerned with food production the dominant crops being roots and tubers, vegetable crops, grain legumes and also forage production.

CARDI has over 30 qualified staff members deployed in the OECS who are concerned with applied and on-farm research oriented toward food production and small farming systems.

The total human resource capability in the OECS is therefore considerable and could become effective within the framework of a clearly defined and well managed commodity programme with necessary operational resources.

U.S. Virgin Islands

Although agricultural activities have declined and the sector is no longer of high importance in the economy of the USVI, there are ongoing research programmes and these islands have recourse to back up services from U.S. Department of Agriculture.

The College of the Virgin Islands has an agricultural experiment station on St. Croix with a staff of 15 professionals, including 10 with post-graduate training, their disciplines include animal breeding, horticulture, agronomy, agricultural engineering and aquaculture.

The main research activities are evaluation of beef breeds for productivity under tropical conditions, evaluation of forage grasses and

legumes and grazing management, agronomic and yield evaluation of root and tuber crops with emphasis on cassava and sweet potatoes, grain legumes, and vegetables. Some work is also done on tropical fruits and aquaculture.

Research and analytical laboratories have facilities for soil and plant tissue analyses, diagnoses of plant pests and diseases, irrigation technology and data processing.

British Virgin Islands

Agricultural activities are constrained by infertile soils and low, unreliable rainfall. There is no effective research capability. Traditional systems of production dominate and the main crops are roots and tubers, grain legumes, usually pigeon peas, and some vegetables.

The Netherlands Antilles

Agricultural Research in the Netherlands Antilles is carried out primarily by the Departments of Agriculture, Animal Husbandry and Fisheries of the different island-governments especially of Curaçao and Aruba.

Research is also being conducted by the Foundation for the Development of Agriculture and Horticulture in the Netherlands Antilles (SOLTUNA) established in Curaçao.

Agricultural production meets some 5 to 10 per cent of local demand.

Most of the research is concerned with intensive and controlled methods of vegetable production, pig and goat breeding and aquaculture.

Caribbean Agricultural Research and Development Institute (CARDI)

CARDI was established in 1975 as an autonomous institute to serve the agricultural research and development needs of the member states of the Caribbean Community,^{8/} and derives from the Regional Research Centre of the University of the West Indies. The Ministers responsible for Agriculture in the participating states comprise the Board of Governors. The Board of Directors is nominated by the Governments usually from the public sector.

The objectives of the institute, as laid down in the "Agreement Establishing the Caribbean Agricultural Research and Development Institute 1975" are:

^{8/} Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago.

- (i) To provide for the research and development needs of the agriculture of the region as identified in national plans and policies;
- (ii) To provide an appropriate research and development service to the agricultural sector of member countries;
- (iii) To provide and extend the application of new technologies in production, processing, storage and distribution of agricultural products of member countries;
- (iv) To pursue for specified periods long term research in pertinent areas;
- (v) To provide for the co-ordination and integration of the research and development efforts of member countries where this is possible and desirable;
- (vi) To undertake teaching functions normally at the post-graduate level, limited to the development of the relevant research by any member country.

The development of the work programme of the Institute takes into account national and regional priorities and the resources available in the form of human resource, finance and facilities.

The Headquarters of the Institute is located on the UWI campus, St. Augustine, Trinidad. There are some 50 professional members of staff deployed in all of the countries served by the Institute. The need to aggregate staff into multi-disciplinary research teams is necessary and some efforts have been made to do so at four locations.

The research activities of CARDI are presently organized into eight programmes:

- (i) Agricultural Engineering;
- (ii) Agricultural Systems;
- (iii) Animal Production;
- (iv) Food Legumes and Cereals;
- (v) Root Crops;
- (vi) Tree Crops;
- (vii) Vegetable Crops;
- (viii) Other Crops and Special Studies.

The University of the West Indies (UWI)

The University of the West Indies (UWI) is an institution with its own Charter and Statutes and governed by a Council and Senate. It has campuses in Barbados, Jamaica and Trinidad and Tobago. The Faculty of Agriculture is located in Trinidad.

The main objectives of the Faculty of Agriculture, UWI are to train agriculturalists at both the under-graduate and post-graduate levels, and to conduct research relevant to the needs of the countries which support it.^{9/} However, the Faculty has built up a high level of research capability and is currently involved with both basic and applied research.

The Faculty of Agriculture has developed a multi-disciplinary approach to research which is presently organized into nine programmes:

- (i) Agricultural Economics;
- (ii) Agricultural Extension;
- (iii) Cereals;
- (iv) Grain Legumes;
- (v) Horticulture - including vegetables and tropical fruits;
- (vi) Land and Water Management;
- (vii) Livestock;
- (viii) Root Crops;
- (ix) Soils.

At present, there are some 40 professional members of staff, 85 research and 350 under-graduate students.

The basic objective of the research programmes is to increase food production. The agronomy research has concentrated on the understanding and development of agronomic and soil management methods suitable for crop production in the environmental conditions of the subregion.

^{9/} Antigua and Barbuda, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Jamaica, Montserrat, Saint Christopher/Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.

The Inter-American Institute for Co-operation on Agriculture

The Inter-American Institute for Co-operation on Agriculture (IICA) is an international intergovernmental organization specialized in agriculture. It is governed by its own Convention and has been recognized as a specialized Inter-American Agency under the Charter of the Organization of American States.

The purposes of IICA are to "encourage, promote, and support the efforts of the Member States to achieve their agricultural development and rural well-being".

IICA has 29 Member States: Argentina, Barbados, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago, United States of America, Uruguay and Venezuela. There are also 12 Observer Countries which contribute to Institute activities: Austria, Belgium, Egypt, France, Germany, Israel, Italy, Japan, Korea, The Netherlands, Portugal and Spain.

IICA has a technical staff of 180 international professionals working throughout the Caribbean and the Americas. There are local offices in Barbados, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Lucia, Suriname and Trinidad and Tobago.

IICA carries out work in ten programme areas: education, support of national institutions for the generation and transfer of agricultural technology; conservation and management of renewable natural resources, animal health; plant protection; stimulus for agricultural and forest production; agricultural marketing and agro-industry; integrated rural development; planning and management for agricultural development and rural well-being; and information for agricultural development and rural well-being.

During the last ten years, IICA has expanded the scope and extent of the activities in the Caribbean. The main objectives of the Caribbean programme are to support Ministries of Agriculture in attaining the goals of their agricultural development programmes. Specifically IICA aims to:

(i) Provide technical expertise in project preparation for external funding;

(ii) To act as a forum for co-operation and the exchange of ideas and experience among Caribbean States and between Caribbean and Latin American States.

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