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## INSTITUTIONAL SUPPORT FOR NEW STRATEGIES IN AGRICULTURE - CARDI

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The traditional plantation crops of the Caribbean have, for various reasons, come under pressure in the 1980's, and, reacting to this, planners have sought to prop up and subsidise these crops at high cost, at the same time, we continue to import, with scarce foreign exchange, billions of dollars of food and beverages which we have and can grow in the Caribbean.

Within easy reach of the Caribbean, a short distance away from Disney World, Florida, a new attraction called the EPCOT Centre will be opened shortly. Here, at what will be a permanent exhibition, one will be able to look at the agriculture of the future. (A variety of food crops are being produced). With the use of techniques of controlled environmental conditions, developed at the University of Arizona. Elsewhere in the United States the sight of a computer controlled tractor executing a variety of farm operations is no longer a wonder to behold.

What then is the future of Caribbean agriculture in this rapidly changing scenario? For many of the countries of the region, agriculture is still the principal sector which has the potential to generate employment, provide increased income and contribute to the nutrition and general well-being of the people. Since more than 80 percent of agricultural holdings are in the hands of small farmers with agriculture as the major activity, this sector has been viewed as the one with the greatest potential for increasing national well being.

Notwithstanding the possibilities for change, the reality of the situation dictates that for the immediate future, the policy decision must be to focus attention on models or mechanisms whereby our people can use the resources of land, water and sunshine to produce most of the food they need. Out of this primary production must come value added industries, and support industries, as well as viable programmes aimed at adequate utilization of primary and secondary products. There must also be a complete integration of crop/animal activities.

The central theme should be a reduction of the imports of food and the utilization of production leading primarily to a greater dependency on things local.

However there must continue, to be *highly specialised foreign exchange enterprises*, but these must be neither widespread nor inefficient.

The role of research and development in support of these strategies will continue to be important if success is to be achieved. The success of agriculture in the developed countries to which reference has been made is a function of the amount invested particularly in research and development activities. While there is opportunity for transfer of technology, developed elsewhere, into the Region,

it must be emphasized that research or technology development must be done within the region itself, if it is to have relevance to the complex agro-socio-economic systems of the thousands of our small farmers.

As we look at our regional research and development Institute in the 1980's, it is obvious that the traditional areas of research for agricultural scientists will continue to be needed in the decade. The shift from the narrow specialisation of the past to problem solving research on a broad basis, begun in the 70's will continue. Specialists will still be needed, but as members of teams working on problems indentified by the scientists themselves or by society as a whole.

Increasingly, the public is asking pointed questions regarding the relevance of higher education and research, and the barometer does not indicate any shift or improvement in this new climate. It is not a friendly climate for 'elitist' institutions like Universities or Research and Development Institutes that would pursue knowledge for its own sake.

The approach of science for the sake of society already begun in the 70's will have to go even further as scientists respond more realistically to social attitudes and needs.

This does not mean that the motivation for invention or innovation will be stymied. Rather, the tools needed could be of the greatest sophistication, but the goals should always be pragmatic.

Organisational structures and procedures and attitudes must change in order to permit the needed shifts. Our own Organisation has made adaptations in structure and procedures, and will continue to make whatever shifts are necessary so as to be effective in responding to the needs of the society that it serves.

While we follow this course, we must not be unaware of what is taking place on the world scene where new and revolutionary approaches are being pursued. It is even hoped that these developments will be comparable to the earlier breakthroughs such as the introduction of chemical fertilizers or the development of artificial insemination.

The use of technology based on the microprocessor is already changing the face of agriculture in the highly developed countries. It is not inconceivable to envisage a team of robots carrying out all the functions that are now associated with agricultural labour, or food being produced in automated factories and run along industrial lines. New vistas seem to be opening up with the prospects of genetic engineering of bacterial strains capable of fixing nitrogen in the root environment of our major food plants. This kind of biological nitrogen fixation, could drastically change and reduce the use of increasingly expensive fertilizers, and save enormous quantities of petrochemical stock needed to produce it, enhance plant growth, and minimise the release of nitrogen into streams and ground water.

Here in the Caribbean we must be aware of these developments, and to the extent that our resources permit, must endeavour to be abreast of this new knowledge and its application to our environment.

The problems involved in embarking on an entirely new approach to our agriculture, utilizing the technology of microprocessors or high energy dependent systems are considerable. A new brand of Caribbean farmer would have to emerge. Before this, our research and development institutions would have to prepare the base for this change. More importantly, the decision would be political, and it

would call for a dramatic direction to be taken by our policy makers. We do not believe that the stage has been set for these changes.

What then are the perspectives of the 80's? As stated before, the focus will be on models or mechanisms that would lead to greater and more efficient production of our food needs locally.

In addition to the normal list of items that goes into any research and development programme aimed at increased agricultural productivity - e.g. focus on plants that are high in protein content, improved adaptability to our environmental conditions and increased resistance to diseases and pests, development of more efficient means of chemical fertilizers and water utilization, more effective methods of reducing food loss both at the pre-and post-harvest stages due to insects, weeds, viruses, fungi, nematodes - it would seem that the more important challenges of the 80's to be met in adapting and expanding conventional technological research will be:

1. The development of technologies for reducing energy use in producing and processing farm commodities.
2. Development of improved farming systems, incorporating where feasible multiple cropping approaches.
3. Extending the work in soil mapping and classification into the area of soil analogues as a basis for information transfer.
4. Gathering, evaluation, (cleaning through tissue culture methods) and preservation of germ plasm stocks.

Already, the Institute has in its work programme developed in consultation with the governments of the region, the basis for addressing these important challenges of the 1980's. These efforts will require trained personnel, financial support and an atmosphere conducive to discovery and innovation. These can only be provided by careful planning and policy decisions.

This Institute stands ready to do its part to meet the overall requirements of the Caribbean society for food, fiber and shelter. The opportunity to do this will depend on the will of those who provide us with support. In this, you and your Society can play a strong role in articulating the importance of research and development in the strategies for agriculture in the 80's.