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A STRATEGY FOR THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY IN THE CDCC MEMBER COUNTRIES

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1. General Orientation

As one reads the CDCC Constituent Declaration one may see that all considerandа are inter-linked as well as all resolutive paragraphs. An analysis of the Work Programme shows the same structure. Therefore, a strategy for the development of Science and Technology must take into account not only the specific mandates, but the general policy formulations guiding all activities put into motion by the CDCC.

Among these general policy formulations, the following are of particular importance, because of their implication on science and technology policies.

The Governments of the Caribbean have reaffirmed "that it is necessary to strengthen the unity and co-operation of these countries in order to carry out joint activities that will benefit the sub-region's economic and social development and increase its bargaining power as regards third countries or groupings of countries."

They have also pointed out that they were "confident that economic, political and cultural co-operation among the countries of the Caribbean will contribute to the necessary unity of Latin America."

They have therefore declared their political will and their resolution to:

> "1. Carry out a policy of the optimum utilization of the available resources of the sub-region.... This policy .... will give impetus to co-operation among member countries, particularly in the implementation of joint projects, the exchange of experience and mutual aid, and through mechanisms .... which will contribute to this end."

Resolution Nos. 11 and 13 are also relevant in the same connection, but there is need to enhance Resolution 16:

> "16. Co-operate in the mutual transfer of technology and of technological and scientific knowledge in order to facilitate the adaptation of imported technology and the development of domestic technologies and increase the bargaining power of the sub-region's countries in operations between the latter and countries outside the area on these matters."

The emphasis on the mutual transfer of technology and of technological and scientific knowledge is further reiterated in Section III, paragraph "A" of the Work Programme. Let it be noted that the first sentence of this paragraph reads:

> "the willingness of the countries themselves to share their capacities is an essential prerequisite for collective action aimed at substantive changes of mutual benefit."

It becomes clear therefore that the governments of the Caribbean countries are aiming at scientific and technological self-sufficiency not only as a basis for the implementation of other mandates given to the CDCC Secretariat, but as a development goal in itself.

2. The Teaching Bias

The elaboration of a strategy for the development of science and technology should be based on two sets of diagnoses: an evaluation of the processes and mechanisms through which knowledge is being produced in the sub-region, and an evaluation of the processes and mechanisms through which decision-making is being fed by the institutions producing knowledge.

Now in attempting to draw a general strategy for the development of science and technology, one must take into account, firstly, that an ample degree of autonomous decision is indispensable to scientific work, and secondly, that the use of such degree of freedom is highly conditioned by the interplay of social forces in the larger society. In other words, if it is thought that the previous situation with respect to the production of knowledge in the Caribbean was deficient, the only explanation would be that the sub-regional social organization was not conducive to scientific self-sufficiency. The type of demands made by the decision-making centres to the learned-institutions was being satisfied by some other device. It follows that the present CDCC mandates are a challenge which have to overcome obstacles deriving from the inertia of traditional practices within the learned-institutions, and between them and the decision-makers.

One can agree that academic institutions within the Caribbean are traditionally geared towards disseminating and not towards producing knowledge. This is a common feature in developing countries and many reasons can be adduced. One of the most accepted and less controversial

reasons refers to a vicious circle born from the scarcity of highly qualified human resources. The few existing scientists tend to be involved in decision-making or in teaching. Universities and other learned-institutions by preparing the intellectual élites put more emphasis on teaching activities than research activities. Incidentally, the reservoir of teaching material being nearly immeasurable, one is afraid that some theories, methods and techniques, and maybe complete disciplines, taught in the sub-region are, to say the least, inconsistent to any sound set of priorities; while others which would help its development are neglected because they are irrelevant abroad.

Research is often made in isolation. In a review of political science research, Mr. J.E. Greene has identified a tendency toward circular sequences of "discovery-neglect-re-discovery." Furthermore, since researchers are even less numerous than teachers, equipment and research material become more expensive in terms of expected output. This in turn creates more difficulty to assess the relevance of what is being taught.

The bias on transmission - instead of creation - of knowledge gives a special role to the encyclopaedic accumulation of information, whereby the more informed person is always in a better position to understand and accumulate more up-dated information. A stiff pyramidal structure emerges and is further reinforced by the possibility open to top level scholars to be absorbed by the decision-making machineries.

Students so prepared have to find some application to what they have been taught, and are sometimes left with the alternatives of out-migration or reconversion of their skills or dissemination of an already unfitted set of knowledge.

3. Toward a research-oriented system

The development of science and technology as presented in the various CDCC documents is conceived basically as the stimulation of indigenous research, adaptation of imported knowledge and exchange of experience and information. This policy guideline translates in itself a set of structural changes at the decision-making level and

it is the task of the CDCC Secretariat to recommend such measures, resulting in an adaptation of the present learned-institutions to these new social goals.

By contrasting the previous reflections with the CDCC mandates, one may infer that the Committee is requesting the creation of more horizontal structures for the creation and dissemination of knowledge. This course of action would have immediate effects on the employment of scarce and highly qualified human resources, and hence on the brain drain, besides an expected impact on the infra-structure of adequate scientific information to support locally the decision-making process.

It is not a question of who will decide upon which discipline, which theory, which method and technique suits the sub-region. The production of science and technology, as well as their application are not matters of individual will. They are the net result of social dialogue and negotiation. Society as a whole decides what is to be studied, taught and applied.

If the production and dissemination of knowledge are social phenomena and their characteristics derive from the type of prevailing social organization, and not from the particulars of individuals who are members of any given society, it follows that the CDCC objectives can only be achieved by setting into motion such social processes resulting in a more intensive production and utilization of science and technology adapted to the sub-region.

The first step therefore, will be to articulate such social groups whose vested interests are linked with the production of science and technology. It seems that the present mechanisms to prepare highly qualified human resources in the sub-region can be modified gradually to achieve this aim. It also appears that this modification can take place without conflicts, in view of certain characteristics of Caribbean societies.

As it is known, most of the Caribbean top scholars have graduated from foreign universities. Most of them, due to their rather modest origin, have benefited from some financial assistance enabling them to pursue their studies. Some of these professionals have produced one or two masterpieces for which they are known. Now in these present times, an increased number of fellowships are granted to Caribbean under-and-post-graduates, and when they return home,

if they ever do, the Academy has to wait two or three years before being in a position to evaluate the skills supposedly acquired abroad.

One can observe an invasion of titles issued by the most diverse foreign institutions, while some of the Caribbean countries do not even possess any mechanism to assess the validity of the diploma, not to speak of the seriousness of the issuing institution. The facts of the matter are that in our small (mainly island) societies, he who has travelled and returned exhibiting a Ph.D. or similar title, is not less than enshrined in a position even before producing any significant piece of work.

It does not seem realistic to hope for some early changes in these trends. Governments will probably have to meet demands toward maintaining if not increasing their subsidies for scholarships. Moreover, a number of scholarships are granted by foreign-private or public institutions, and it is rather difficult to influence their policy in a direct manner.

Nonetheless, a social milieu can be created to curb the negative side effects of the indiscriminate search of foreign diplomas, thanks to the approval by the CDCC of the creation of the Caribbean Council for Science and Technology and of the Caribbean Council for Economic and Social Development. These Councils are to be the forum where research institutions and individual researchers meet regularly to discuss their findings on the sub-region.

In the very same way that a new "doctor" is rapidly known and granted prestige in our small societies, a researcher who produces an interesting study, particularly on some unexplored field relevant to our societies, receives acknowledgement. He becomes prestigious for something which is known and assessed, and at the same time he contributes to the advancement of science and technology in the area.

High-level professionals are indeed scarce in the area, but if to each of them a certain number of assistants are attached in order to realize research on agreed topics, these assistants will be participating in the advancement of Caribbean Science and Technology,

and achieving at a lower cost for the society, a prestige not much inferior to the one accrued to a Ph.D. holder.

By the same token, the functioning of the Council offers to both mentors and disciples, possibility of advancement on the wider Caribbean scenery, while the isolation of the sub-regional academic institutions is broken. Comparative research can easily take place and progress toward self-sufficiency in the creation and dissemination of knowledge will be eased.

The second step the Secretariat is considering, in accordance with the mandates formulated by the Committee, consists in articulating real collaboration and exchange with non-Caribbean scientists, universities and other learned-institutions. These mandates refer specifically to mainland Latin American Institutions.

The Committee, by deciding the creation of the Councils, is at the same time guiding the process of scientific development in the sub-region. The strive for scientific and technological self-sufficiency is intimately linked with what could be termed a "productive openness" of the sub-region.

While most institutions sponsoring scientific development, within and outside the United Nations family of organizations, within and outside Latin America, are readily prepared to recognize that the Caribbean has been a mostly neglected area, yet they usually wish to interfere by offering training courses. The Secretariat of the CDCC has had to refrain those attempts not only because they are bound to enhance the traditional bias towards teaching, but because they foster conflicts between the academic communities in contact. One wonders what can be taught by someone who acknowledges his lack of experience in a given social context. Putting aside some exceptional fields, one may agree that the Caribbean academic institutions are perfectly equipped for teaching.

But whenever research is concerned, joint and/or comparative ventures are mutually profitable. They open new areas of knowledge for sponsoring organizations and they stimulate scientific development in the sub-region. Furthermore, close links between Caribbean and non-Caribbean scientists are established, which may result without any difficulty in future "training" courses. Joint and comparative researches finally will have as the end result a re-orientation of academic relations in Latin America, and among developing countries.

To achieve this goal it is nonetheless necessary to create these Caribbean institutions as distinct from those of mainland Latin America. The traditional neglect or marginality of this sub-region has inspired efforts to merge the sub-region in organizations with larger geographical coverage. It would seem clear that any piece of work adapted to the Caribbean circumstances, may raise some interest in any larger context. Its internal congruency will be appreciated, but sound criticism cannot be formulated because of the traditional marginality and neglect of the Caribbean. The presence of Caribbean science and technology in any other larger context can only be felt if channelled through Caribbean institutions suited to assess them.

The third step which derives from the CDCC objectives and mandates is related to the relevance of both basic and applied research. If the Caribbean has to develop its own technology and adapt imported ones, it cannot achieve this objective by an over-emphasis on applied or action-oriented research. The availability of the sub-regional learned-institutions to embark on basic or theoretical research must be preserved, since theories and methods are the instruments with which applied research are done. It would be inconsistent to increase our efforts in action-oriented research as well as our imports of theories, methods and techniques. Such a dichotomy between applied and theoretical work is a false problem which is often put forward to obscure the dilemma of requested and externally funded research on the one hand, and self-imposed sets of priorities and research on the other.

The Councils of Science and Technology, and of Economic and Social Development will also be a forum where the objectives set by the CDCC member countries will be discussed with all governmental, academic and private institutes, as well as the steps to meet these objectives. The research body will enunciate what can and cannot be achieved within existing conceptual frameworks.

The Secretariat of the CDCC will therefore endeavour to organize this forum where all parties interested in achieving self-sufficiency in the creation of science and technology will be in constant dialogue. The Secretariat expects that from this dialogue the present potential

of the sub-region will develop in all the extent permitted by the social determinants of scientific and technological production.

If research is enhanced, if its dissemination is accelerated through the other CDCC projects (see Joint ECLA/UNESCO Programme - E/CEPAL/CDCC/19, Addenda 1, 2 and 3), the following multiplying effects are expected:

i. more development of pure research;

ii. more development of applied research;

iii. more linkages between researchers and policy-makers;

iv. gradual reconversion toward a more balanced relation between teaching and research in the institutions of higher education;

v. gradual creation of more horizontal structures where larger numbers of scientists and technicians can be employed and diminution of the brain-drain;

vi. real collaboration and exchange with non-Caribbean scientists, universities, and other learned-institutions, i.e. a "productive openness" of the sub-region and possibilities of co-operation with the rest of Latin America and other parts of the world.