Evaluation of Unesco's Regional Ministerial Conferences
on the Application of Science and Technology to Development

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With the assistance of Mr. Arun Abraham
Introduction

This report represents the response to Unesco to their request that the author conduct "a comprehensive evaluation of the CAST/MINESPOL" cycle of regional ministerial conferences* on the application of science and technology to development convened by Unesco. The series began with "CASTAla" (Santiago de Chile, 1965), and embraces the preparations under way for "CASTAfrica II" (Arusha, Tanzania, 1987), and "CASTArab II" (tentatively planned for 1988-89). The evaluation was to be conducted according to the "Guidelines for the Planning and Implementation of Impact Evaluations to be carried out in 1986-87 [CEU/Work.Series/2, 27 February 1986]".

The essential questions of this evaluation are:

1. Should Unesco continue to organize a series of ministerial meetings of the type represented by the past CAST/MINESPOL meetings?
2. If not, what justification is there for terminating the series?
3. If the series is to be continued, what, if anything, should be changed?
4. If changes are to be made, what should their nature be, and what changes in output and impact would Unesco expect?

In conducting the evaluation, three phases of activity were taken into consideration:
- the preparatory phase for each meeting;
- the meetings themselves; and
- the follow-up phase to each meeting.

In particular, in looking at the follow-up to ministerial meetings, an attempt has been made to identify any impact on national science and technology policies or programs of either member governments or international institutions which could be attributed to the conclusions of the meetings. Throughout, it has been assumed that the underlying purpose of this series of meetings is to bring about positive changes in the ways in which science and technology are applied to the development of member states and the perspective for the evaluation has been that of a member state.**

While the conclusions of this report are the responsibility of the author alone, much help has been provided to him by many people.

* These conferences are referred to as "RMCs" in the text.
** Appendix 1 contains a note on the specific goals of the RMCs.
At the outset of the evaluation, there was announced a decision by the Nordic countries to carry out a detailed evaluation of the two MINESPOL conferences, as a contribution to UNESCO's evaluation activities. The author has collaborated very closely with Dr. Hans Landberg of the Swedish Council for Planning and Coordination of Research who is leading the Nordic activity. The two evaluations used similar approaches, asked similar questions, and appeared at the time of writing to be coming to largely similar conclusions. The cooperation extended by the Nordic group to the present evaluation was most useful.

Most of the information collected for the evaluation of the CAST series of conferences was done by direct interviews using a common structured interview format. Interviews were conducted in a range of developing countries in all parts of the world, usually with Ministers and/or very senior officials of science and technology policy agencies. In some cases, interviews were also held with senior members of academic communities both to identify their general level of knowledge of the CAST series of conferences and, in some specific cases, to learn of experiences in follow-up activities. Wherever possible, attempts were made to locate actual participants in RMCs - a task which was difficult for the first cycle of meetings due to the passage of time. It should also be noted that, if one excludes UNESCO officials, only six people have ever attended two RMC's; the evaluator succeeded in obtaining comments and insights from two of those people.

In addition to the author, interviews were carried out by the six Regional Directors of IDRC (Adzei Bekoe, Kenya; Fernando Chaparro, Colombia; Jingjai Hanchanlash, Singapore; Fawzy Kishk, Egypt; Vijay Pande, India; and Bruce Scott, Senegal) and by a member of the Board of Governors of IDRC, Dr. Albert Butros of Jordan. The author is most grateful to them and to IDRC for making their time and travel available.

In Ottawa, I received significant help from my staff and from two short-term assistants. Mr. Arun Abraham made a major contribution to drafting some sections of the document.

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The report which follows begins with a brief description of the environment in which the RMCs take place; Section II deals with the origins of the series of meetings and summarizes the main themes of debate, while Section III reviews who actually participated in the meetings. It is in Section IV, dealing with the preparatory process, that the report begins to draw heavily on the views expressed during the survey undertaken for this evaluation. Section V provides commentary on the meetings themselves, Section VI seeks to describe their tangible impacts, and Section VII provides remarks on UNESCO's support for the CAST meetings. The report ends with a set of conclusions.
I INSTITUTIONAL ENVIRONMENT OF REGIONAL MINISTERIAL CONFERENCES

It is important to bear in mind the substantial changes which have taken place in the world's economy since the CAST meetings began. In the early 1960's the world economy was expanding and there was optimism about future development of the Third World. By the time that the second cycle of RMCs began, the global economy was heading towards turmoil and the ability of most developing countries to sustain any scientific or technological activity had already begun to decline.

In approaching this analysis, one must also recognize the complexity of the institutional environment in which the Regional Ministerial Conferences on Science and Technology are planned and carried out. The CAST series has provided a forum for the developing countries to discuss both North-South and South-South issues, while the MINESPOL meetings sought to provide the countries of Europe and North America with the chance to develop a dialogue within the context of East-West relationships. As these meetings have evolved, the range of issues under debate has broadened substantially and now cover the fields of activity of a large number of institutions engaged in science and technology.

The first level of complexity concerns UNESCO's mandate and interaction with its member countries. While the three principal domains for UNESCO are education, science and culture, there has been a marked tendency for national governments to make education ministries their points of contact with UNESCO. During the early years, where only the pure sciences were concerned, few difficulties in coordination surfaced. After 1963, the organization made a quantum leap to incorporate "technology" as part of its mandate. Recent observations suggest that the difficulties in coordination have been compounded in many nations, because "technology" is an important element of the activities of ministries responsible for industry, agriculture or health, but is rarely an element of the mandate of education ministries. National bureaucratic rivalries come into play.

At a second level, the United Nations itself represents an intricate network of multilateral relationships. Within the UN system, there is a fragmentation of institutions, many of which have significant involvement in science and technology issues. The UNCTAD, UNDP, UNIDO and various Regional Economic Commissions all promote international cooperation in science and technology in one form or another. This already complex situation is significantly exacerbated by the fact that the prevalent mood among these organizations tends to be one of rivalry rather than of cooperation. As a result, the contributions of the separate and disparate parts are less than might be hoped.
The policy environment is made progressively more complex yet by the emergence of sub-regional organizations. Some, like the Council for Mutual Economic Assistance (CMEA) or the Organization for Economic Cooperation and Development (OECD) are well established, while others, like the Association for South East Asian Nations (ASEAN) have developed more recently. Since the membership composition of these groups tends to be more homogeneous than that of Unesco Regional Ministerial Conferences (RMCs), it is likely that members will place greater faith in obtaining practical benefits in the short and medium term from the sub-regional institutions.

The RMCs bring together a large number of countries with different political and organizational structures and differing perspectives on global issues. Asia serves as a good case to illustrate the diversity. This region contains the largest and smallest countries in the world, some of the poorest and some of the most technologically advanced, and includes both centrally planned and market economies.

As will be shown later, the RMCs also bring together delegations headed by Ministers or officials with a range of decision-making powers and widely differing sectoral mandates.

Finally, concepts of the aims of national science policies have significantly broadened, from the orientation of the 1960's which focussed largely on the financing and organization of science and technology (still an important issue today) to today's additional concerns about ways and means of integrating concerns about science and technology throughout governmental policy-making processes, and especially through the area of economic policy formulation.

It is within this domain of considerable complexity that the RMCs are planned, carried out, and are expected to have an impact.

II THE ORIGINS AND THEMES OF RMCs

The authority for Regional Ministerial Conferences (RMCs) on the application of Science and Technology (S&T), the focus of this report, stems from the regulations for the general classification of various categories of meetings convened by Unesco. Under Category II directives, RMCs represent "intergovernmental meetings other than international conferences of States", where the terms of reference and participants (Articles 20 and 21) are determined by the General Conference or Executive Board. The primary participants in this case are representatives of Member States at the Ministerial level, while the organization and preparatory activities are carried out by Category VI Expert Committees.1

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Table 1 lists these conferences as they have occurred, and indicates their duration and the General Conference resolutions which form their basis.

Table 1
Regional Ministerial Conferences on the Application of Science and Technology

<table>
<thead>
<tr>
<th>Title</th>
<th>Location</th>
<th>Year</th>
<th>Duration (Days)</th>
<th>Authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASTAla I</td>
<td>Santiago, Chile</td>
<td>1965</td>
<td>10</td>
<td>res. 2.211,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13th Session</td>
</tr>
<tr>
<td>CASTAsia I</td>
<td>New Delhi, India</td>
<td>1968</td>
<td>12</td>
<td>res. 2.312,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14th Session</td>
</tr>
<tr>
<td>MINEPOL I</td>
<td>Paris, France</td>
<td>1970</td>
<td>6</td>
<td>res. 2.12,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14th Session</td>
</tr>
<tr>
<td>CASTAfrica I</td>
<td>Dakar, Senegal</td>
<td>1974</td>
<td>10</td>
<td>res. 2.121,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17th Session</td>
</tr>
<tr>
<td>CASTArab I</td>
<td>Rabat, Morocco</td>
<td>1976</td>
<td>10</td>
<td>res. 2.121,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18th Session</td>
</tr>
<tr>
<td>MINEPOL II</td>
<td>Belgrade, Yugo.</td>
<td>1978</td>
<td>6</td>
<td>res. 2.121,</td>
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<tr>
<td></td>
<td>利亚</td>
<td></td>
<td></td>
<td>19th Session</td>
</tr>
<tr>
<td>CASTAsia II</td>
<td>Manila, Philippines</td>
<td>1982</td>
<td>9</td>
<td>res. 2.01,</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>21st Session</td>
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<tr>
<td>CASTAlac II</td>
<td>Brasilia, Brazil</td>
<td>1985</td>
<td>7</td>
<td>res. 9.1,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22nd Session</td>
</tr>
<tr>
<td>CASTAfrica II</td>
<td>Arusha, Tanzania</td>
<td>1987</td>
<td>10</td>
<td>res. 6.4,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23rd Session</td>
</tr>
<tr>
<td>CASTArab II</td>
<td>No final decisions yet taken</td>
<td></td>
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</table>

According to the guidelines circulated by Unesco, the operational procedure for each RMC involves three phases: preparation, meeting and follow-up. The preparatory phase is concerned with problem identification, country reviews and situation analysis. The actual meetings revolve around general commissions of study, discussion and debate leading to a series of conclusions and recommendations, while the follow-up intends to set into motion those mechanisms necessary for the implementation and monitoring of the conference recommendations2.

This section focusses on some trends in the cycles of RMCs to date, the prevalent themes and sub-themes, and outlines the principal questions for analysis in the subsequent sections. There is some difficulty in undertaking this kind of evaluation, due to the fragmentation and even absence of relevant information. Nevertheless, formal documentation combined with materials from press clippings, interviews and questionnaires, provide a suitable base for the report.

In very general terms, the first cycle of RMCs has raised a political awareness of the importance science and technology policies (S&T) among the parties involved. The second cycle, now approaching completion, has initiated a wide range of discussion culminating in broad recommendations for the application of S&T policy for development.

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From its inception in 1946 up to the early sixties, UNESCO had played a secondary role in the organization of different types of conferences. Early UNESCO activities revolved around education and basic sciences, for it was believed that applied sciences were out of UNESCO's jurisdiction. With the emergence of significant international discussion of the role of science and technology in the economic development process between 1960 and 1964, changes occurred within UNESCO and its attention to science policy issues began to grow. Amid some internal dissension, the 1963 science budget increased by fifty percent. This came about, in part, as a response to "opportunities and demands articulated by new client states", rather than to good initial performance or to UNESCO's possession of "intricate linkages with related activities". Furthermore, UNESCO represented a voice against the UN headquarters' vision of science and technology, particularly after the 1963 Geneva Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas. UNESCO essentially set in motion the CAST RMCs as a reaction to this conference, which in their view, failed in its analysis of how science and technology might be harnessed by the developing world. In his address to the Geneva Conference, UNESCO's Director General, Rene Maheu, argued that it would be "illusion" to think that importing foreign technology or the "hasty implantation of applied sciences in ready-made form" could solve the problems of helping to promote the technological advancement of the LDCs. "It can only be solved in a radical manner... through an indigenous process".

The initiative was welcomed by developing countries since it pointed clearly in a direction which supported their efforts to break with their past dependency on the industrialized countries. In retrospect, this UNESCO-sponsored view was a significant contribution to developing countries' understanding of the broad directions which they would have to follow. On a quite different plane, however, this outspoken view only acted to harden the rivalry among UN agencies each vying for a leadership role in international science and technology activities.


The groundwork for the CASTAla I in Santiago was laid in Lagos in 1964 at the International Conference on the Organization of Research and Training in Africa in Relation to the Study, Conservation and Utilization of Natural Resources. The Lagos Plan intended to assist African governments in taking steps towards the advancement of scientific research. Other conferences along similar lines were organized in cooperation with UNESCO in the other regions.

The CASTAsia I in New Delhi, 1968 and the CASTAfrica I in Dakar, 1974 reinforced UNESCO's early initiatives. They provided countries with a forum to:

(a) exchange information on science and technology policy;
(b) examine their own S&T capacities and their role in development; and
(c) promote research and management to meet perceived goals.

It was recognized, during this time, that the linkage between education and S&T was critical, and even more important, that the interrelationships between S&T and the various sectors in which the results of research might be applied would be key determinants in the search for paths to development.

The UNACAST World Plan of Action of 1971 defined by sector the parameters for further discussion. These included: S and T policies and institutions, S and T education, natural resources, food and agriculture, industry, transport and communication, housing and urban development, health, population, relevance and application of new technologies. This, combined with a preparatory meeting in 1975, allowed the CASTArab 1976, convened in Rabat, to identify some areas for joint cooperative projects. The participating countries at the Rabat Conference were mainly concerned with energy and natural resources, and particularly with questions on desertification and conservation, irrigation, coastal and water problems and marine sciences.

The first cycle of RMCs, by and large, served to raise the profile of S&T policies. National governments recognized that science and technology are associated with economic growth, that they are intimately engaged in the international economic system, and that they have the potential of contributing to the advancement of social development.

The nature of the discussions at RMCs has transformed somewhat during the second cycle. While most of the basic issues, such as curriculum development and the braindrain, are still mooted in the proceedings, a good portion of the discussion at CASTAsia II revolved around the transfer of technology, allied research, employment, information services and modes of financing projects. The CASTAlac II, in particular, sounded out the concerns of the Latin American economies with regard to their external debt pro-
lems. In this vein, both conferences have made inroads toward the planning and coordination of S&T for development by forwarding broad sets of recommendations. The general features of the discussion have been twofold:

1) how to develop S&T capacity in the context of a developing country; and
2) how to handle, from a policy perspective, the S&T initiatives of the industrialized countries.

There are several salient trends emerging from the RMCs. First, there is a noticeable and increasing heterogeneity in the types of issues under review at the conferences. Where CASTAla I dealt with vague concerns as a kind of "feeling out" process, the issues in recent conferences have become more diverse. Some are specific, like research on medicinal plants in African regions, while others such as the transfer of technology, represent general global concerns, much debated in many international fora.

Secondly, one must take into account contextual factors, since each country is placed in a unique set of circumstances, and all are at different stages of social and economic development. As such, their agendas and priorities vary markedly, as does the framework of S&T policies themselves. Recognizing these differences has meant that conference agendas have had to be cast in the most general of terms.

Table 2A below attempts to summarize the issues debated in the second cycle of CAST meetings, indicating also those themes which were also discussed at the two MINESPOL meetings.

Table 2A: Principal Themes and Sub-themes of CAST

Human Resources
1. education at primary, higher, technical, informal and non-formal levels;
2. education and employment - curriculum development*;
3. brain drain - how to cultivate climate conducive for scientists*;
4. role of universities in research cooperation*;
5. administration through standardization - terminology, measurement*;
6. organization and sharing of information*;
7. research management*;
8. media / communications, popularization of S and T*;
9. urban migration.

Industries
1. linkage between research and industry*;
2. interrelationships between industries / sectors;
3. S & T infrastructure / capacity*;
4. development of agroindustries;
5. development related to topography and environment - marine, coastal, desertification, mountain;
6. development of biotechnology products and processes;
7. commercialization / joint marketing projects;
8. equipment, spare parts, instrumentation;

Finance
1. external debt problems of developing countries;
2. internal / external financing of projects and recommendations;

Technology Transfer
1. market structure: a) monopoly among suppliers;
   b) restrictive business practices; c) dependency thesis;
2. assimilation / unpackaging of technology;
3. appropriate technology - innovation*;
4. design framework for host governments;
5. trade implications*;

* indicates relevance to MINESPOL discussions.

The MINESPOL series of conferences has provided a forum for countries in Europe and North America to discuss S&T issues in an East-West as distinct from North-South framework. These meetings have differed substantially from the CAST. While Table 2A identifies some of the themes which both conferences have in common, Table 2B illustrates some of the themes unique to MINESPOL.

Table 2B: Themes Unique to MINESPOL

Human Resources

mobility and career planning for scientists and researchers; R and D for increased manpower productivity;
development of planning models to explore relationship between S and T manpower and overall economic performance;
focus on fundamental sciences;

Industrial Strategies: Research and Development

financing of R and D through national budgets, promotional and special funds;
stimulate investment in science-based industries and capital goods sector;
reduction of imports of primary products;
reduction of technology purchases, patents and licenses;
market-oriented research for export development;
non-market research - impact studies on urbanization, social needs, medicine, transportation and communications infrastructure, ecology;

Transfer of Technology

nature of information flows and documentation services;
role of multinational enterprises;
feasibility of joint ventures and other instruments for cooperation;
different types of transfer - vertical and horizontal.

A review of the debates indicates that, in fact, the CAST and MINESPOL are not only heading in different directions, but that they are diametrically opposed on certain issues. A good portion of the MINESPOL II proceedings was couched within the framework of proposals for a New International Economic Order. Yet the discussions tended to propose a protectionist posture, especially with regard to imports of raw materials and primary products, the principal exports of many developing countries. Beyond the East-West political undercurrents, and the noticeable gap between the S&T resources of Europe and North America on the one hand and the developing world on the other, implicit in the MINESPOL dialogue was the desire of the industrialized countries to maintain their technological advantage, and subsequently, their competitive edge, over other countries, including, implicitly, the developing countries5.

It could be argued that the attention devoted to North-South issues at Minespol II was an outcome of the activities of the member countries in their preparations for the UN Conference on Science and Technology for development which was to take place in August 1979.

III THE ATTENDANCE AT REGIONAL MINISTERIAL CONFERENCES

The paramount feature of these conferences is that the key participants should be at the Ministerial level. The RMCs were designed to provide occasions for Ministers to put forward questions on S&T which are important to their respective countries. One must bear in mind, however, that these questions rarely appear at the top of the political agenda at home, particularly the long range, broad issues.

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However, as Tables 3 and 4 illustrate, in most cases, only a minority of countries have arranged to have Ministers attend the conferences, and moreover, there is no way of determining the extent of participation by these Ministers. The largest group of Ministers in attendance, as well as those officials recognized as "delegates", represent education portfolios, while the second largest group held specific responsibility for science; however, none were responsible for economic, trade, or finance, ministries usually considered high ranking portfolios.

Table 3: Conference Delegates

<table>
<thead>
<tr>
<th></th>
<th>Nations</th>
<th>Ministers</th>
<th>Sen. Middle</th>
<th>Diplomats</th>
<th>Academ.</th>
<th>Other</th>
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<tr>
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<td>18</td>
<td>1</td>
<td>20</td>
<td>16</td>
<td>11</td>
<td>25</td>
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<td>CASTAsia I</td>
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<td>14</td>
<td>22</td>
<td>28</td>
<td>26</td>
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<td>MINESPOL I</td>
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<td>64</td>
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<td>CASTAfrica I</td>
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<td>10</td>
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<td>42</td>
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<td>15</td>
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<tr>
<td>CASTArab I</td>
<td>16</td>
<td>7</td>
<td>27</td>
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<td>19</td>
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<td>MINESPOL II</td>
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Table 4: Ministerial Portfolios at RMCs

<table>
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<tr>
<th></th>
<th>Education</th>
<th>Science</th>
<th>Planning</th>
<th>Culture</th>
<th>Resources</th>
<th>Total</th>
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<td>-</td>
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<td>2</td>
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<td>1</td>
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<td>-</td>
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<tr>
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<td>8</td>
<td>5</td>
<td>5</td>
<td>83</td>
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IV THE PREPARATORY PROCESS

The previous sections of this report were based mainly on a detailed analysis of the published records of the CAST Meetings; the remainder draws heavily upon the results obtained during the structured sets of interviews carried out with Ministers, high officials and senior scientists in all regions.

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The overwhelming view of all respondents who were familiar with the preparatory process associated with CAST conferences was that the preparations were completely controlled by - and in some sense "belonged to" - the UNESCO Secretariat, and in particular, the Paris-based staff of the Division of Science and Technology Policy.

It is true that a series of preparatory meetings are held prior to the actual ministerial gatherings, but developing-country participants appeared to believe that they could influence events only in marginal ways. This is almost certainly not the goal of the current Secretariat, but it is the reality as perceived in national circles. There was little evidence that national officials saw the preparatory process as "their" means of placing on the Meeting Agenda those issues of most significance to their Ministers.

In some cases, especially with respect to the first cycle of meetings, there still remained resentment at the nature of the contributions to the preparatory process provided by some consultants retained by UNESCO, Paris. However, on the other side of the coin, it appears that few, if any, national officials have ever attempted to initiate a line of thinking designed to shape overall agendas more closely to any national point of view. So, as a result, the preparatory process rolls forward, national papers are prepared more or less in conformity to an outline prepared in Paris, overall conference documents eventually are produced and the meetings take place. There is a sense of almost inevitability to the process, leading to the thought of "who really is driving the process?"

In several parts of the world, respondents were careful to separate their criticism of the role of UNESCO, Paris from their commentaries on the potentially useful role which might have been played by the relevant regional office in the preparatory process. Some of UNESCO's regional offices - like ROSTLAC in Montevideo - are held in high regard in their regions and national governments would have welcomed the allocation of more responsibility to such offices in the work prior to CAST conferences. Others are seen to be hampered by decisions made in Paris, such as the one which placed the expert on S and T Policy for Africa in the Education Office, BREDA, in Dakar rather than in the Science and Technology Office, ROSTA, in Nairobi. (It should however be noted that, in general terms, the UNESCO policy of subregional decentralization had been approved by the General Conference.)

It is also important to note that there are frequently significant failings on the side of national governments as they "participate" in preparations for CAST meetings. As an extreme example, in one country which will participate in CASTAfrica II, the national body responsible for Science and Technology was unaware of UNESCO's call for national papers exactly one year after they all had been sent out! The document had failed to be passed
on by the Ministry which serves as that country's liaison with UNESCO. [The evaluator had a copy of the document made in a local bookstore, and passed it on to responsible S&T officials; it is to be hoped that a national paper will, in the end, be submitted.] Such examples of lack of cooperation among departments and agencies of the same government are to be found throughout the world and they significantly hinder concerted action. In other countries, especially those with an active National Commission for UNESCO, such problems are much rarer.

It should also be noted that a more adequate preparatory process would require a significant increase in the amounts of work undertaken by officials in national capitals. National delegates to preparatory meetings would need to be briefed and authorized to take positions on behalf of their governments, so domestic consultations would need to be much more systematic. A number of officials interviewed, who had participated in past preparatory processes, appeared to have acted in a personal capacity*** during preparatory meetings, and to have conducted little, if any, domestic discussion of the issues. In such cases, the governments from which these particular officials were drawn could, in no sense, be considered to be committed to the preparatory process.

V THE MEETINGS THEMSELVES

The first impressions of the meetings expressed by most officials are that

(i) they are too long - few, if any, Ministers can afford to spend 10 or 12 days at a single international conference;
(ii) they are too general - perhaps an inevitable feature of meetings designed to serve such diverse interests; and
(iii) while the first cycle of meetings did have important political effects in many countries (discussed in Section VI), little, if any, practical impact has resulted from these conferences of the second cycle which have already taken place.

Why should this be the case?

The following hypothesis may go some way to providing at least a partial explanation. Ministerial meetings are at their most effective when they are used to settle the final major issues within, or to give necessary political commitment to, detailed programs which previously have been the subject of intensive work, and negotiation, if necessary, among officials. [This argument is valid both at a national level and at the international level].

*** In conformity, no doubt, with the rules governing the classification of UNESCO meetings - a set of rules which, to the Evaluator, appeared to be badly in need of reconsideration.
In the case of CAST and MINESPOL meetings, however, as a direct result of the lack of commitment of governments to the preparatory process, the meetings themselves represent the beginnings of processes which could (but usually do not) lead to international cooperation in S&T rather than representing the culmination of a process in which participating national governments have felt themselves to be fully engaged.

It was suggested during a variety of interviews that the concept of having Ministers meet over lengthy periods, and starting their discussions from very broad agendas, betrayed a lack of familiarity among UNESCO staff of the pressures on present day Ministers responsible for S&T policy. While the intentions of the UNESCO secretariat were praised - since officials recognize the need to encourage Ministers to discuss and consider long-term issues - many respondents believe that the impractically broad agendas simply preordain a diffuse outcome.

While it appears to the Evaluator that there is validity to this criticism, there are equally valid criticisms to level at national officials. As indicated in the previous section, no national officials appear even to have tried to insist that a more narrowly focussed agenda be selected, that adequate and intensive preparatory negotiations take place, and that the actual Ministerial sessions be brief enough (2 to 3 days) to ensure that a maximum number of Ministers are present together to maximize the possibility of a political consensus emerging.

On the substance of the meetings, and as is evident from the brief résumé presented earlier in Section II, the broad topics ranged over many of the general issues which were of importance at the time of the meeting (note, for example, the prominence given to the question of External Debt at CASTAlac II in 1985), but the level of debate remained so abstract that concrete decisions to actually do anything remained elusive.

VI THE IMPACT OF REGIONAL MINISTERIAL CONFERENCES

From almost all interviews with officials from developing countries, it is evident that the first cycle of CAST meetings had the widespread - and much needed - effect of raising political consciousness of the important contributions which "endogenous" scientific and technological efforts could make to the process of economic and social development. As a result of these meetings, many governments moved to reorganize, strengthen, or in some cases, to create machinery for the formulation of national science and technology policies. This was an important contribution for UNESCO to have made via the first cycle of CAST meetings; however, neither the second cycle of CAST meetings nor the two MINESPOL conferences can lay claim to such a tangible contribution to national S&T activities.
Beyond this general and real achievement, it is difficult to identify other practical outcomes where the way in which S&T is either supported or organized has been materially changed as a result of CAST meetings.

Perhaps the most significant attempt to follow up on recommendations from a CAST meeting is the "African Network of Science and Technology Institutions (ANSTI)", and it may be useful to examine this case to show what has been achieved and how it is viewed. (It should also be noted that officials of a variety of countries challenge the contention that ANSTI is a direct result of CASTAfrica I and express reservations about its utility.)

ANSTI is currently a set of some 13 networks, operating in 9 subfields of engineering and 4 of the natural sciences, involving some 64 institutions in 40 African countries. It is beyond the midpoint of a second 4-year period of funding, the funds being supplied by UNESCO, UNDP and the Government of the Federal Republic of Germany. Its very small secretariat operates from ROSTA, Nairobi.

ANSTI aims to promote curriculum development, exchange of staff and exchange of graduate students in Africa, in the fields covered by its subnetworks and its terms of reference clearly seek to bring about the implementation of CASTAfrica recommendations on

- fields of regional cooperation (Recommendation #2B7);
- human resources for scientific and technological activities (#3);
- training of scientific and technological cadres (#6);
- cooperation in the provision of facilities for training scientific and technological personnel (#27);
- mobility of scientific personnel in Africa (#29); and
- university cooperation in the field of R & D (#30).

However, despite the generally positive assessment of ANSTI and its potential provided by university staff associated with its networks, no African government is at present making any contribution to its operation - even in local currency. As a result of this lack of commitment by governments, the donor agencies involved may well feel it necessary to reconsider any future involvement.

If a well-conceived concept, put together with the minimum of overhead costs, cannot command the support of the governments whose interests the system was designed to serve, what does this say of the degree of commitment being made by participating governments at the CAST meeting whose debates gave impetus to its creation?

Other meetings of the first cycle gave rise to the creation of modest regional activities, e.g. a continuing committee of experts on S&T policy in Latin America which met seven times between CASTAlac I and II and an office to promote European Coopera-
tion in S & T which came about as a result of MINESPOL I, but neither of these institutions appears to have made a significant impression on the course of S&T in their respective regions. Why? Because member governments have not chosen to make them important vehicles for the promotion of regional debate or action.

A more elaborate follow-up mechanism was put in place by the participating states at CASTARAB I, involving a committee of four ministers, a small secretariat and some resources which allowed meetings to be held and a feasibility study to be executed on the concept of an Arab Bank to finance science and technology. Unfortunately, this initiative was overtaken by events unrelated to science and technology and the follow-up activity died out without achieving its goals.

So, the CAST meetings, set in motion in direct response to the perceptive view of the needs of developing countries articulated by UNESCO through its Director General in 1963, began by having widespread political impact, but now appear to have become largely ineffectual. We need now to ask why and what might be done?

VII UNESCO SUPPORT FOR CAST MEETINGS

The Science and Technology Policy Division of UNESCO's Science Sector has been the Division primarily responsible for the conception and organization of the series of CAST and MINESPOL meetings. In the present period of financial stringency, it is important to note that this Division, at the present time, has only 9 professional staff members of whom 7 are based in Paris, the other 2 being assigned to BREDAG (Dakar) and ROSTLAC (Montevideo). The Division's approved budget for 1986-87 is 1.1 million USD, and there is little expectation that this will change in the next fiscal period. Against this background, it has to be realized that a full-fledged CAST meeting such as CASTArab II would cost between 450,000 - 500,000 USD assuming that three languages would be used and that a single preparatory meeting would be included in the budget. As can be seen, this would represent about 50% of the non-salary funds available to the Division. Even a scaled-down meeting with only two languages being permitted and without a preparatory meeting would need a budget of at least 200,000 USD.

It appears clear to the evaluator that the resources available to the Science and Technology Policy Division, both financial and human, are not sufficient to sustain a regular cycle of Ministerial meetings and to provide support to member governments in the implementation of recommendations.

Could adequate support be found elsewhere in UNESCO and applied to the task of facilitating cycles of Ministerial Meetings
which would be useful to member governments? The evaluator gave consideration to suggesting that the whole Science Sector (which, for example, has over 100 professional staff members) might become the source of support, but concluded that:

(i) such a recommendation would be unlikely to command the enthusiastic support of all nine of the specialized divisions of the sector; and

(ii) more significantly, it would be likely to compound the difficulties of internal coordination among the various ministries of participating governments whose interests find reflection in one or other of the sectors divisions (e.g. Ministries of Mines, Ministries of Fisheries, Ministries of Environment).

In addition, given the range of diverse interests represented by these divisions, the production of balanced agendas would lead those agendas to become as long and all-encompassing as those of the current CAST meetings. It should also be noted that the range of disciplines covered by the Science Sectors falls far short of the range of interest to Ministers response.

There is another, highly significant, structural problem which UNESCO faces. One of the major challenges faced by all governments as they seek to harness science and technology to the development process is the need to harmonize their initiatives in S&T policy with their actions in economic policy - but UNESCO has no mandate to deal with issues of economic policy.

Conclusions

The original goal of the CAST meetings appears to have been that of increasing the political awareness of developing-country governments, in the matter of the significance of science and technology to the development process and of the crucial role to be played by their own, domestic, science and technology efforts. With respect to this goal, the first cycle of CAST conferences should be judged successful.

However, having reached this initial goal, the CAST meetings have proceeded with a momentum of their own, but with neither the specific new goals nor the political commitment from member governments needed to permit them to make lasting contributions to the use of science and technology in the process of development. In addition, they consume a disproportionate share of the limited resources allocated to the Science and Technology Policy Division within UNESCO. A third cycle of CAST meetings similar in structure, preparatory process and orientation would be unlikely to produce any more tangible results than has the second cycle, and so it is recommended that the simple repetition of another cycle of meetings of the current type not be undertaken.
It would appear that MINESPOL I cannot claim the element of success which can be attributed to the early CAST meetings, since the countries of the European Region had already equipped themselves with the governmental machinery needed for supporting science and technology, and that MINESPOL II had no more tangible effect than any of the more recent CAST Conferences. Given this, no MINESPOL III should be contemplated.

In the previous section of this report, there was a brief note on the potential of alternate sources of support within UNESCO for cycles of Ministerial meetings which ended in a negative conclusion.

The fundamental problems of the presently conceived series appear to the evaluator to be the following:

1. Because the only politically acceptable basis which UNESCO can use to determine participation in such meetings is that of geographical regions, the range of interests represented will always be so wide that, of necessity, the agenda has to be made all encompassing leading, inexorably, to discussions that are so general that they are of little practical effect.

2. UNESCO and the member countries have failed to recognize that Ministerial meetings can only have effect if they are used to put final approval from governments to carefully negotiated agreements on cooperation. The present preparatory processes are quite inadequate for this task.

3. Member governments give no indication, in their subsequent actions, that they feel committed to participation in the implementation of the recommendations of such meetings.

4. The cyclical nature of the system means that particular meetings do not respond to particular needs or opportunities: they take place simply because it is a particular region's turn.

These negative conclusions do not mean that Ministerial Meetings on S and T can never be useful; far from it. But they do point out that the institutional constraints placed upon UNESCO - largely by the decisions and predilections of member states - make it very difficult for UNESCO to respond to the particular needs of smaller subgroupings of states which could give rise to opportunities for practical actions.

While the conclusions of this evaluation, to this point, have been negative, the evaluator does wish to stress that all countries, and particularly developing countries, can potentially realize significant benefits from multilateral discussions of the problems of applying science and technology policy to development and that those involved and concerned - both inside government and
within the research system - in the developing world do not enjoy frequent opportunities to consult and discuss with each other.

To respond to this genuine need, the evaluator was tempted to recommend that UNESCO turn its attention to promoting regular meetings of senior officials, i.e. to try again the experiment attempted in Latin America between CASTAlac's I and II and proposed, in the preparatory process for CASTAfrica II, as a possible outcome of that meeting. This would be possible, but there is no assurance that such meetings would do other than duplicate the discussions hosted by the UN's various Regional Economic Commissions or that they would be any more productive than the sessions of the Intergovernmental Committee on S and T for Development which was created by UNCSTD in Vienna in 1979.

Perhaps what is required is a little more boldness, and there are two fronts on which UNESCO might try to make progress.

1. UNESCO could perhaps better use its funds to promote sub-regional meetings on particular issues in S and T policy to which might be invited both active researchers and policy officials from governments since in many countries dialogue among these people is often significantly lacking. It would be even more useful if officials from economics, finance or planning ministries could be invited since adequate debate on the interaction of S and T policies and economic policies is essential in today's world. In the same way that the first cycle of CAST meetings led to the creation of institutions to deal with S and T policy, perhaps meetings such as those indicated above could improve the state of national dialogues among the main actors who should be influencing the application of S and T to development.

2. A concerted effort needs to be made within the UN system to create viable working relationships among the varied bodies, including those of UNESCO, of the Regional Economic Commissions, and of UN New York, which grapple with the problems of S and T policy. The evaluator believes that UNESCO should actively try to foster improved relationships. It is the understanding of the evaluator that good working relationships exist between ECLAC/CEPALC and ROSTLAC in Latin America as well as with ECWA in the Arab region, and that the UNCSTD in New York is currently seeking to redefine its activities in ways which would lead to increased inter-Agency cooperation. All countries, and especially developing countries, would gain if the agencies of the UN worked together rather than in competition.

If meetings of officials and of those active in the research systems of member countries can be organized so as to lead towards clearly defined activities in which multilateral efforts would improve the application of science and technology to some aspect of development then, and only then, should UNESCO consider the possibility of a Ministerial meeting of interested member governments to launch those efforts.
POSTCRIPT

As indicated at the opening of this report, two separate evaluation activities have been carried out, one by the Nordic countries focussing on the MINESPOL Conferences, the other on the CAST Meetings. In addition, UNESCO convened a group of experts to review these evaluations and to provide their advice to the organization.

From all of these separate exercises one can discern some principles to which all appear to subscribe. These principles are in the form of necessary conditions which need to be fulfilled prior to the calling of an RMC. They are:

(1) That Ministerial Meetings should take place only when member countries have identified specific reasons for such meetings to take place.

(2) That member governments should be fully engaged throughout the preparatory processes and that they organize all necessary consultations within their own countries as essential elements of the preparations.

(3) That participating governments who wish to have increased opportunities for international collaboration in science and technology created by RMCs should be committed to active participation in the implementation of the decisions of the RMCs. (One consequence of this condition is that delegations to an RMC need to be empowered to commit their governments to participating in the implementation of any decisions reached; this can only be achieved if the government involved has been fully engaged in the preparatory process.)
Appendix I

Goals of the RMCs

The ease with which the "impact" of any activity can be evaluated is directly related to the clarity or explicitness with which the goals of that activity is expressed. The broader the goal, the easier it is to claim that the goal has been attained.

This problem presented itself clearly in the evaluation of the UNESCO-sponsored RMCs. It is the view of the evaluator that the underlying purpose of the RMCs was to bring about positive changes in the way in which science and technology are applied to the development of UNESCO's member states, but an examination of the record shows that the specific goals of the different RMCs could be interpreted as being much more modest.

In reviewing the decisions taken in UNESCO, either by the General Conference or by the Executive Board, it is revealing to consider the operative verbs used in the descriptions of the purposes of the conferences.

The first three conferences had purposes which could be characterized as "passive":

CASTALA I was held in response to a decision "to assess technological needs..."

and "to organize regional conference(s)...."

CASTASIA I was "to consider action required to further the application of science and technology to development..."

MINESPOL I was "to examine national science policies and identify subjects which may require regional cooperation, as well as to study ways of securing the cooperation of regional intergovernmental organizations for these purposes."

It could be argued that the simple act of holding these conferences ensured that a literal interpretation of their objectives had been fulfilled. The next two meetings had much more ambitious and action-oriented objectives.

The next two meetings had much more ambitious and action-oriented objectives.

CASTAFRICA I was

"to exchange information on national S and T policies to improve the application of these policies and the execution of research activities
to promote scientific and technological research

to stimulate technological innovations

to examine the role of science and technology in government
activity as a whole

to foster international cooperation to meet these goals...

while CASTARAB I was

"to exchange information...

to examine, collectively and at ministerial level the possibility of taking governmental action, in certain restricted and carefully defined fields, in order to strengthen those aspects of their national policies and regional co-operation in science and technology;

to decide on the most suitable measures to be taken for following up the recommendations..."

When the second cycle of RMCs began, the more extensive definition of goals implying action which had characterized CAST-AFRICA I and CASTARAB I had been replaced by a return to the statement of more modest ambitions. Thus,

MINESPOL II was "to assist Member States to exchange information and views..."

CASTASIA II was "to examine..."

and CASTALAC II was, also, "to examine...".

One can only conclude that the formulation of specific objectives for six of the eight RMCs was clearly guided by a great sense of prudence!

Perhaps, however, there is an explanation, beyond prudence, for what could appear to be the weakness of objectives set out for RMCs. In days before structured evaluations had become regularly used management tools, it was sufficient to say what an activity was designed to do, with the question of why the activity was being undertaken being either left as understood or taken as self-evident. In the case of this evaluation, the evaluator believes that the Member States and UNESCO launched the RMCs for a very important reason - in order to seek to improve the application of science and technology to development. It is for this reason that the evaluation seeks to judge the impact of the RMCs against such an exacting standard.