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ACTIVITIES OF THE WORLD METEOROLOGICAL ORGANIZATION (WMO) IN THE DEVELOPMENT OF HYDROMETEOROLOGY IN LATIN AMERICA

Document prepared by the World Meteorological Organization

Before proceeding to describe the activities of the WMO in the field of hydrometeorology in Latin America, it is perhaps desirable to give, for the information of the delegates to the Seminar, some general ideas about the work of the Organization.

WMO is one of the specialized agencies of the United Nations; its relationship to the United Nations is therefore similar, for instance, to that of UNESCO, FAO and WHO. Though the Organization celebrated its tenth anniversary only last year, international collaboration in meteorology in various forms dates back more than 100 years. The first international conference on meteorological problems was held in Brussels in 1853 and the first international meteorological organization, the IMO, was established as far back as 1878. This was a non-governmental organization. The WMO, which has taken the place of the IMO, has based its organization on similar lines. Most of the technical work of a world-wide character is carried out by technical commissions covering various fields of basic and applied meteorology and on which all the 110 members of the Organization have the right to nominate experts. The regional problems are taken care of by regional associations each covering one of the six main continents of the world. For instance, Regional Association III covers such activities in South America, Region IV in North and Central America. The WMO has a technical secretariat in Geneva which assists and coordinates the work of the various constituent bodies of the Organization and carries out technical studies required by these bodies.

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An important activity of the WMO is its programme of technical assistance. Through the Expanded Programme of Technical Assistance and more recently through the Special Fund of the United Nations, WMO has been playing an active role in assisting countries in organizing their meteorological services and developing their activities in the various fields of meteorology and hydrometeorology. Under the Expanded Programme, experts in various fields have been provided to countries for advising them on their meteorological problems. Also, by awarding fellowships, selected personnel of many meteorological services have been enabled to undergo specialized training in foreign countries in different branches of meteorology so that they could take up higher technical responsibilities in the expanding activities of their country's meteorological services. In South America, at present, WMO experts are working in Chile, Ecuador, Peru and Paraguay. Hydrometeorology and meteorological studies in connexion with schemes of water resources development have been among the subjects for which WMO experts have been provided to some of the countries. Special mention may be made here that WMO has made an important contribution in the project for the development of the Lower Mekong River in South East Asia.

Hydrometeorology and those aspects of hydrology which are in the border land between meteorology and hydrology, such as evaporation, precipitation and water balance have always been included among the responsibilities of WMO. Prior to the third WMO Congress which took place in 1959, most of the work in hydrology in WMO was done by the Panel on Water Resources Development of the Executive Committee. As part of the work of this panel, the following WMO Technical Notes have been published: "Design of Hydrological Networks" prepared by Mr. Max A. Kohler, and

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"Techniques for Surveying Surface-Water Resources", by Professor Ray K. Linsley. In view of the increasing importance of the role which hydrometeorology and hydrology have come to play in the economic development of countries in recent years, the responsibilities of WMO in these subjects were discussed in detail by the Members both prior to and during the third WMO Congress. The great importance of hydrology in the economic development of countries and the need for international cooperation in this field were recognized and Congress decided that WMO should be responsible for those aspects of hydrology which are closely related to meteorology. It further decided to establish a Technical Commission for Hydrological Meteorology with the following terms of reference:

(a) The study and formulation of meteorological requirements for hydrology, especially with regard to the rapid exchange and arrangement of data;

(b) The design and promotion of networks for the measurement and study of those parameters in the hydrological cycle which involve meteorological considerations;

(c) The development, improvement, promotion and international standardization of methods, procedures and techniques for:

(i) the application of meteorology to hydrology, for example in such problems as river-stage forecasting, flood forecasting and the study of seiches; and

(ii) the provision of meteorological services to international hydrology.

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It was also decided to continue the active participation of WMO in the United Nations programme of Water Resources Development.

The Commission for Hydrological Meteorology was effectively established on 23 September 1959, when 30 Members had designated their experts. As of 1 January 1961, 49 Members of the Organization, represented by 95 experts, are participating in the work of this commission. Mr. Max A. Kohler, Chief Research Hydrologist, United States Weather Bureau, was elected President of the commission in March 1960; at the same time, a Section for Hydrological Meteorology was established in the Technical Division of the WMO Secretariat. The first session of the commission took place in April 1961 in Washington, D. C. The following subjects, which have a direct bearing in the planning of water resources development projects, figured in the agenda of the session: networks in hydrological meteorology, climatic atlases with respect to water resources development and meteorological factors in hydrologic design.

One of the important tasks of WMO is convening of international conferences, seminars and symposia in order to promote the development of scientific research and the exchange of experience in the field of meteorology and hydrology. Two such seminars relating to hydrometeorology have been held in recent years. An "Inter-Regional Training Seminar on Hydrologic Forecasting and the Water Balance" was held in Belgrade in October-November 1957 and the other was an "Inter-Regional Joint ECAFE/WMO Seminar on Hydrological Networks" held in Bangkok in July 1959 as part of the WMO Technical Assistance programme.

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Turning now to the part played by WMO in the meteorological and hydrometeorological activities in the countries of South America, mention has already been made of the WMO experts under the Expanded Programme of Technical Assistance working at present in Ecuador, Peru and Paraguay. The expert in Paraguay is advising the government on agrometeorological problems. The experts in Peru and Ecuador are assisting the governments in organizing their meteorological services for aviation. As a result of these missions, the networks of meteorological and agrometeorological observations have been improved, aviation and other forecasting services organized and personnel of the national meteorological services have been trained to carry out various meteorological duties efficiently.

In the field of hydrometeorology in particular, WMO is cooperating with the Economic Commission for Latin America in its programme of preliminary examination of the water resources and prospects of their use in the countries of Latin America, by furnishing an expert hydrometeorologist to be attached to the ECLA Water Resources Survey Group. The WMO expert joined the group in 1957 and has so far visited with the other members of the group, Chile, North Patagonia, Ecuador, Venezuela and Bolivia. In each of these countries, the team carried out a detailed survey of the available data and facilities for the appraisal of water resources and formulation of development programmes. As a result of the surveys, the team has made specific recommendations with regard to the steps to be taken in the organization of the water resources development programmes in each country. The surveys have been of great value as they have served to bring out the potentials of water

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resources, as also the deficiencies of the available basic data and the existing network of stations for the collection of such data. The WMO expert's part in these surveys consisted in the collection and analysis of hydrometeorological and hydrological data from all available sources. He has also collected information on the hydrometeorology, hydrography and agrometeorology of the countries concerned as well as on the existing organizations dealing with these subjects. From these, he has compiled valuable reports containing a fund of factual information and has given his recommendations for the improvement of networks and organization in order that hydrometeorological data may be used to the maximum advantage in the agricultural and water resources developments of the countries. Some of the findings of the WMO expert which were common to most of the countries he visited were the inadequacy of the existing network of hydrometeorological and hydrological stations, lack of reliable long-term data of precipitation, river flow and other characteristics of the river basins, and the dispersal of the responsibility for the collection of meteorological data among a number of agencies resulting very often in lack of uniformity in the methods of observations, instrumentation and compilation of data within the country. The recommendations of the expert are mainly aimed at removing these defects.

The activities of WMO in the field of hydrometeorology and hydrology in Latin America have been considerably increased within the last two years with the establishment of Special Fund projects in these fields in some countries of the continent, for which WMO has been made the Executing Agency. The Special Fund projects in Chile as well as in Ecuador are for the purpose of expanding the existing meteorological and hydrological networks and organization in the countries in order to provide the basic data needed

for the development of their water resources and economy and in particular, their hydroelectric power, water supply, agriculture and aviation. The operations of these two projects commenced in 1960 and they will take about four years to complete. A similar project for Peru has been commenced early in 1961. Under these Special Fund projects, WMO, as the Executing Agency, provides the experts and equipment needed and also fellowships for candidates selected by the governments of the countries concerned, for training in meteorology and hydrology. The WMO experts assist in and supervise the execution of the project and also train the local personnel in the various operations.

It is the hope of WMO that the countries of Latin America will take greater advantages of the various types of United Nations assistance such as the Expanded Programme and the Special Fund to bring their meteorological and hydrological organizations and services to adequate levels. In this way, these services will be able to play their proper role in the economic development of their countries.