



UNITED NATIONS ECONOMIC AND SOCIAL COMMISSION

FOR ASIA AND THE PACIFIC

AND

WORLD METEOROLOGICAL ORGANIZATION

REPORT OF THE TYPHOON COMMITTEE

ON ITS NINTH SESSION

Manila, Philippines
23 - 29 November 1976

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC
AND
WORLD METEOROLOGICAL ORGANIZATION

Typhoon Committee
Ninth Session
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I. ORGANIZATION OF THE SESSION

1. The ninth session of the Typhoon Committee was held at the Philippines International Convention Center, Metro Manila from 23 to 29 November 1976.

Attendance

2. The session was attended by representatives of Hong Kong, Japan, Malaysia, Philippines, Republic of Korea, and Thailand, and by observers from Australia, France, United States of America, United Nations Development Programmed (UNDP), Office of the United Nations Disaster Relief Co-ordinator (UNDRO), League of Red Cross Societies (LRCS), and Committee for Co-ordination of Investigations of the Lower Mekong Basin.

Opening addresses

3. Opening addresses were given by Dr. Roman L. Kintanar, Administrator of the PAGASA, Mr. H. Rudy Gontha, Special Assistant to the Executive Secretary of ESCAP, who delivered the Statement of Mr. J. B. P. Maramis, Executive Secretary; Professor J. Nemec, Director of the Hydrology and Water Resources Department, on behalf of the Secretary-General of WMO, Dr. D. A. Davies, and by the Honourable Juan Ponce Enrile, Secretary of National Defense.

4. The participants were welcomed by Dr. Kintanar who expressed the pleasure of the Government of the Philippine in having the honour to act as host to the ninth session of the Committee. He also, on behalf of the Committee, welcomed the

representative of Malaysia as a new member of the Committee.

5. Mr. H. Rudy Gontha, on behalf of Mr. Maramis, congratulated the Committee on its accomplishments in its various phases of activity over the past year, and referred to the increasing contributions of the member countries to the Committee's programme which was of great importance to human well-being in flood-prone areas, where the rural sector was particularly affected. He welcomed the presence of representatives of supporting countries and international bodies, and expressed his confidence that this pattern of support and mutual assistance would continue.

6. Professor Nemec conveyed to the Committee the assurances of Dr. D. A. Davies, Secretary-General of WMO, of WMO's continuing interest in and support for the Committee's important activities. He stressed the link between the WMO Tropical Cyclone Project and the Typhoon Committee's endeavours, as well as the WMO Executive Committee's invitation to Members to continue to support countries affected by tropical cyclones through the WMO Voluntary Assistance Programme or bilaterally. In conclusion he recalled the recent appeal made by the Secretary of Foreign Affairs of the Philippines at the current session of the UN General Assembly for strengthened international co-operation with WMO in its efforts to mitigate the disastrous effects of tropical cyclones.

7. The Honourable Juan Ponce Enrile welcomed the delegates, and stressed the increasing importance of a proper understanding

of weather technology as a factor relating to national survival in the developing world. The session was underpinned by two significant considerations - firstly, the interest of regional preparedness, involving a broader sharing of knowledge, expertise and capabilities with a view to mitigating the destructive effects of typhoons, and, secondly, the interest of regional unity which bore a close significance for the welfare, growth and stability of individual nations. It was his hope that the exchange of information and technology generated by the Committee would form the basis for a broader regional consensus in facing common problems and that the session would strengthen the scientific background of the participating nations.

Election of Officers

8. Dr. Roman L. Kintanar (Philippines) was re-elected Chairman of the Committee for 1976/77; Dr. In Ki Yang (Republic of Korea) was elected Vice-Chairman; Mr. Twee Montrivade (Thailand) was elected Chairman of the Drafting Committee.

Agenda

9. The Committee adopted the following agenda:
1. Opening of the session
 2. Election of the Chairman and Vice-Chairman
 3. Adoption of the agenda
 4. The Committee's activities during 1976
 - (a) Meteorological component
 - (b) Hydrological component

- (c) Community preparedness and disaster prevention
 - (d) Training
 - (e) Research
5. UNDP technical support to the regional typhoon programme
- (a) For the period 1974-1976
 - (b) For the period 1977-1981
6. Contributions to the regional typhoon programme from sources other than UNDP
7. Programme for 1977
- (a) Meteorological component
 - (b) Hydrological component
 - (c) Community preparedness and disaster prevention
 - (d) Training
 - (e) Research
8. Co-ordination with the WMO Tropical Cyclone Project and regional programmes
9. Consideration of the agenda for the next session of the Committee
10. Date and place of the tenth session
11. Scientific lectures
12. Adoption of the report

II. THE COMMITTEE'S ACTIVITIES DURING 1976

(WED/TC.9/3)

10. The Committee reviewed the progress made in implementing its programme during 1976. It noted with satisfaction that significant improvements had been made in various fields and specific mention was made of new radar stations and telecommunication facilities, of the community preparedness and disaster prevention activities such as preparation of the Guidelines and the Seminar held in Japan, and of joint collaboration in research activities. The Committee was also informed of the steps taken for expansion of flood forecasting systems in the Philippines and for implementation of pilot flood forecasting systems in the Lao People's Democratic Republic and Thailand.

A. IMPROVEMENT OF METEOROLOGICAL FACILITIES

11¹ The review of meteorological facilities was based upon the requirements of the World Weather Watch for its observing and telecommunication systems with special reference to the priorities established by the Committee at its eighth session. The latest information on the state of implementation, deficiencies and further plans was utilized for this review.

Global Observing System (GOS)

TCS 12² In regard to the network of RS/PW stations in the Philippines, the Committee recalled its earlier recommendation to concentrate on three RS/PW stations (Cebu, Clark and Laoag). It noted with

satisfaction that special efforts made by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) resulted in an increased number of observations (80-85%) at Laoag and Cebu. Observations from Clark continued to be received regularly. The occasional interruptions at Laoag and Cebu were mainly on account of shortage of hydrogen gas. The Committee was informed that steps were being taken to ensure an adequate supply of chemicals for operation of the hydrogen generators. The ground equipment for the ES/EW station at Zamboanga was installed in May 1976 and regular observations were expected to commence there soon. A wind-finding radar was to be installed at Davao in the southern part of the Philippines for which WMO VAP assistance had been offered by the USA.

TCS 13. The Committee was informed that the 10-cm radars at Baguio, Cebu, Virac and Daet in the Philippines were operational while that at Guiuan was ^{temporarily} out of commission due to lack of spare parts. The 5.6 cm radar at Manila was damaged by a fire in the building in June 1976 and steps were being taken to recommission it. The 10-cm radar at Basco (included in the priority list) and a 5.6 cm radar at Aparri in northern Luzon were expected to be operational in the near future. It was also proposed to install a 10 cm radar at Tanay near Manila.

14. The Committee noted with satisfaction that a 10 cm radar had been installed at Bangkok and that it came into regular operation in March 1976 and that ~~that~~ radar was equipped with a video integrator and processor (VIP) system. Arrangements were being made for the

transfer of the 10 cm radar from Khon Kaen in northeast Thailand to Chumphon on the east coast of south Thailand. The two 10-cm radars at Bangkok and Chumphon, together with the existing 5.6 cm radar at Songhla on the east coast in the extreme south of Thailand, would provide a good network of radar stations in Thailand for tracking tropical cyclones.

no / TCS

15\$ The eighth session was informed of the USSR offer of assistance under VAP to establish a 10-cm radar in Vientiane (included in the priority list). The Committee was pleased to learn that the radar was expected to be shipped from USSR in October and its installation was planned to be completed by Soviet experts by the end of 1976. ✓

~~TCS~~

16\$ The Committee expressed concern that some of the radar stations in the region were experiencing difficulties in proper calibration and maintenance, mainly for want of adequate spare parts and shortage of trained personnel. It accordingly welcomed the information that a technical note "Performance test, trouble shooting and preventive maintenance of a meteorological radar", prepared by the telecommunication and electronics expert of the TCS, provided useful guidance for the maintenance of weather radar. The Committee urged the member countries to give special attention to calibration and maintenance of weather radars with the assistance of the TCS.

WMO

17.7 The Committee recalled that five USSR research vessels had operated in the Western Pacific in 1975, and had provided valuable surface and upper air observations, but regretted that no information

was yet available on the future programmes of the USSR ocean weather ships. It expressed the hope that USSR would consider the continuation of the programme in future years.

188 The Committee learned with interest that Japan had operated the ocean weather station "Tango" at 29°N , 135°E during the period May to October 1976. It was also reported that JMA's weather ship "Keifumaru" made special observations of typhoons during July and August 1976 at 20°N , 130°E , and during September 1976 at 30°N , 140°E .

199 The Committee noted with satisfaction that the Japanese ocean buoy No. 3 at $25^{\circ} 40'\text{N}$, $135^{\circ} 55'\text{E}$ was operational from August 1976 and that a new ocean buoy No. 6 was ~~planned to be~~ installed at $37^{\circ} 30'\text{N}$, $134^{\circ} 30'\text{E}$ in November 1976. Ocean buoys No. 4 ($28^{\circ} 21'\text{N}$, $126^{\circ} 05'\text{E}$) and No. 5 ($37^{\circ} 00'\text{N}$, $147^{\circ} 00'\text{E}$) had been discontinued in December 1975, but the latter will be operative again in March 1977.

TCS 20. Global Telecommunication System (GTS)

Ø The Committee noted with satisfaction that the programme for improvement of the national data collection in the Philippines had been pursued in 1976 with the assistance of the TCS. New antennae were under installation at selected stations particularly needed for night time data collection. It was reported that the scheme would be extended to other stations after trials with the new antennae.

TCS 21. The representative of Hong Kong reported that his country was experiencing difficulty in obtaining adequate coverage of data during

night hours and urged members to investigate and take remedial measures as appropriate.

TCS

22~~1~~ The Committee was pleased to learn that UNDP-provided radar picture transmission equipment including antenna had been installed at Cebu and Daet radar stations and reception trials had been carried out at Manila with the help of the telecommunication and electronics expert of the TCS. Three additional sets of radar picture transmission equipment procured by PAGASA are to be installed at Basco, Aparri and Baguio radar stations. The Committee noted with satisfaction that an integrated radar picture transmission network would thus be established in the Philippines and that neighboring countries could intercept the radar picture signals by means of an ordinary facsimile recorder and an SSB type radio receiver.

0/TCS

23. The Committee was informed that, in connection with the improvement of national data collection in the Philippines, arrangements were being made for implementation of a VAP project through an offer made by the Government of France. The equipment to be provided under the VAP project comprised a 1 KW SSB transmitter, an SSB receiver, two sets of log-periodic antennae and some spare parts. The representative of France confirmed that the antennae had already been shipped to the Philippines and the other equipment would be shipped by the end of 1976.

24~~2~~ The Committee was informed that PAGASA had proposed to the National Economic Development Authority the acceptance of a loan from

the Overseas Economic Co-operation Fund (OECF) of Japan to establish a computerized Automatic Data Editing And Switching System (ADESS) to be used for improving national data collection and data transmission to the RTH.

~~TCS~~

25. The Committee noted with satisfaction that the two 10 KW medium wave transmitters installed in 1975 under the direct control of PAGASA enabled prompt dissemination of typhoon warnings within the range of the transmitter. The VHF link between PAGASA and the radio transmitting station had operated without interruption. The Committee was also informed that to improve further the dissemination of typhoon warnings throughout the country, a scheme drawn up by TCS for provision of VHF links between PAGASA and the principal radio and TV stations and concerned agencies at Manila such as the National Disaster Control Centre, was under consideration by PAGASA.

26. The Committee was pleased to learn that five sets of 100 W SSB radio transceivers and antennae as well as spare parts, donated by Japan under bilateral assistance for the improvement of national data collection, had been received by the Meteorological Department of the Lao People's Democratic Republic in January 1976.

~~TCS~~

27. The Committee expressed its concern that the Bangkok-Vientiane point-to-point link was working in one direction only, with transmissions from Bangkok to Vientiane. The Meteorological Department informed the TCS that transmissions from Vientiane remained temporarily suspended because of damage to the antennae system by fire.

MO/TLS 28.18

The Committee learned with satisfaction that telecommunication equipment worth US \$48,000 provided by UNDP, including two sets of 1 KW transmitters, receivers, teleprinters, FSK tone-keyers and one set of log-periodic antenna, had been received by the Meteorological Department in Bangkok. That equipment for the strengthening of the Bangkok RTH was expected to be operational before the end of 1976. The revised VAP request for additional equipment was still under negotiation with potential donor countries.

29.18 The Committee was pleased to learn that eight teleprinters provided to the Republic of Korea under the UNDP project had been in operation since the middle of 1976 and that those teleprinters had assisted in improving national data collection.

30.20 The Committee noted with satisfaction that the Hong Kong - Peking point-to-point circuit, included in the priority list, had been implemented in December 1975. The representative of Hong Kong reported that automatic switching of messages to and from Peking, Tokyo and Bangkok had been introduced by using an IBM System - 7 computer since April 1976.

TCS

31.21 After reviewing the current status of the observing and telecommunication facilities required for the typhoon warning system, which formed part of the World Weather Watch plan, the Committee examined the priority list established by the eighth session and

revised the list as given below.

Observing facilities

(i) Upper-air stations

Already planned

48991 Phnom-Penh (Democratic Kampuchea) - VAP request

98223 Laoag (Philippines))
98645 Cebu (Philippines)) 12 GMT radiosonde/radiowind

(ii) Weather radar

Already planned

Cheju (Republic of Korea) (or other selected site) -

National project

Vientiane (Lao People's Democratic Republic - VAP request
(offered by USSR)

Basco (Philippines) - National project (being
implemented)

(iii) Ocean weather station

Already planned

Ship at 16°N, 135°E (offered by the USSR)

Telecommunication facilities

(i) ^{Improvement} ~~Implemented~~ of national collection facilities

Already planned

Lao People's Democratic Republic - National/bilateral project
Philippines - National/VAP project

(ii) Regional telecommunication links

5. Bangkok - Phnom-Penh - National project
Bangkok - Saigon - National project
Tokyo - Peking - National project (being implemented)

(iii) Other telecommunication facilities

Partial implementation planned

6. Thailand - strengthening of RTH, Bangkok - National/VAP project

The Committee urged member countries to endeavour to establish those facilities as soon as possible.

32. In addition to the questions dealt with above, the Committee recorded its view on a number of other matters under the meteorological component of its programme. These are summarized below:

Typhoon forecasting techniques

33. The Committee noted with satisfaction that the preparation of a manual on techniques for the prediction of intensity and movement of tropical cyclones had been undertaken by USA with the collaboration of Hong Kong, India, Japan, USSR and the TCS as a sub-project of the WMO Tropical Cyclone Project. The final report on this sub-project was expected to be available by the summer of 1977.

20/TCS
JCS

34. As requested by the Typhoon Committee, the Japan Meteorological Agency had undertaken the translation into English of its manual on typhoon forecasting. The Committee noted with appreciation that the English text of the manual had already been printed and was being mailed by JMA to all members of the Typhoon Committee. The representative of France expressed the view that several non-member countries such as his would also be interested in obtaining copies of this manual.

Output products of RMCs

35. As desired by the Committee, the TCS carried out a review of the output products of the Regional Meteorological Centres (RMCs) in relation to the requirements for typhoon warning. The output products were generally found to meet member's requirement and no particular change was considered necessary for the present.

Exchange of radar fixes

TCS

36. The Committee noted with satisfaction that radar fix messages had been exchanged between member countries as in previous years. The representative of Hong Kong reported that the programme of exchange of radar fix messages has been very satisfactory during 1976. Such messages were disseminated whenever eye fixes could be determined by the Royal Observatory radar. Eye fixes were also received by Hong Kong from radar stations in Japan and in the

Philippines. Attention was drawn to the fact that the network of radar stations had been improved with the installation of a 10-cm radar at Bangkok during the current year and that further improvement was expected with the installation of additional radars in the Philippines in 1977. The Committee once again urged the member countries to continue to take all possible steps to ensure regular and prompt exchanges of radar fix messages.

Meteorological satellites

37. The Committee was pleased to note that Japan was continuing its preparation for launching the GMS at 140°E in July 1977. As regards the ground facilities in Japan, the command and data acquisition station was already equipped with the necessary electronic equipment and an 18-metre paraboloid antenna, and the data processing centre was equipped with a computer complex. A brochure entitled "A guide for receiving the Weather Facsimile Transmission through the Geostationary Meteorological Satellite of Japan" was distributed by the Japanese delegation to the participants at the session.

Meteorological Reconnaissance flights

WMO 38. The Committee noted with appreciation that reconnaissance flights by United States aircraft in the typhoon area had continued to provide valuable information for typhoon warning services. It expressed the hope that the United States would continue its programme of typhoon reconnaissance flights in the years ahead.

B. Improvement of Hydrological Facilities

39. The Committee noted with interest the progress made in the development of comprehensive plans for, and the implementation of flood forecasting and warning systems in selected river basins of member countries. Important developments during 1976 had included the following:

JAPAN

40. Quantitative estimation of rainfall by radar was put into use in operational flood forecasting systems after ten years of investigation and research. By the end of 1975, the Ministry of Construction had installed 669 rainfall telemetering stations and 662 water-level telemetering stations; 101 additional rainfall telemeters and 78 water-level telemeters were due to be installed in the fiscal year 1976; in addition, there were many rainfall telemeter systems controlled by the Meteorological Agency and the local governments.

REPUBLIC OF KOREA

41. The Han River flood forecasting system was operated satisfactorily in general. The Ministry of Construction issued two flood alerts and one flood warning in August 1976. Damage to a relay station caused by lightning in June 1975 was repaired. Certain improvements were also made to the system. The Government of Japan, in this connection, provided an equipment grant of a value of US\$500,000, Training of 10

was
The
Tel
excitation.

telecommunication engineers and 2 hydrologists was carried out in Japan during the two months from September to November 1975.

42. The Government of the Republic of Korea invited a team of Japanese experts to visit the country for the purpose of increasing the capability of the Han River flood forecasting system in March and April 1976. The team made proposals for the improvement of hydrological techniques and telecommunication facilities. The TCS hydrologists participated in part of the mission. Equipment, worth US\$15,000, brought by the team was donated to the Flood Forecasting Center.

LAO PEOPLE'S DEMOCRATIC REPUBLIC

AP | TCS 43. The report on the preliminary survey for the establishment of a pilot flood forecasting system in the Se Bang Hieng River basin carried out by a team of Japanese experts was forwarded to the Government of Lao People's Democratic Republic in July 1976. The TCS hydrologist visited Vientiane in October 1976 and explained the report to the agencies concerned. The Government expressed its interest in setting up a hydrological network to cover the whole of the Se Bang Hieng basin with the possible assistance of Japan.

PHILIPPINES

44. The Government of the Philippines invited a team of Japanese experts to review the implementation of the Pampanga flood forecasting system in December 1975. The team, in co-operation with TCS, prepared a number of recommendations for the improvement of the system and its operation. One set of survey equipment brought by the mission was donated to the Flood Forecasting Center.

✓ 45. The Philippine Government, in line with the suggestion made by the above review mission, made a request to the Government of Japan for the assistance of a telecommunication expert and for the training of a telecommunication engineer working in the Flood Forecasting Center. In response to the first request, a Japanese telecommunication expert was assigned for a period of three months starting in July 1976. Various spare parts for the telemetering network of the Pampanga flood forecasting system, of a value of US\$7,500, were brought by the expert and donated to the Flood Forecasting Center.

LAP/TCS 46. In May 1976 a severe typhoon (Didang) caused serious flooding in Central Luzon and the Pampanga River reached its highest recorded water level. The Flood Forecasting Center issued timely flood advisories which facilitated effective rescue operations, evacuating, and flood fighting by the agencies concerned. In view of the recognized effectiveness of the pilot flood forecasting system, the Government initiated prompt action to extend flood forecasting to cover five other important rivers, including the Agno which had been already under study by the Government in co-operation with TCS. With a view to facilitating an early implementation of the new project, financial assistance for equipment was requested from Japan. The Government of Japan sent a team of eleven experts to conduct a feasibility survey of flood forecasting for the Agno, Cagayan and Bicol river basins in Luzon Islands in response to that request.

47. The monitoring station of the Pampanga flood forecasting system, damaged by a fire in December 1974, was

repaired and put back into operation in August 1976.

48. The Committee was informed that the Philippine Government was preparing for the installation of a hydrometeorological telemetry network in the Marikina River basin, which includes Manila. At present the network was primarily intended for monitoring the hydrological regime of the river basin, especially during floods. Later it was planned to improve the system by including flood forecasting.

THAILAND

49. Arrangements similar to those in 1975 were made by the Meteorological Department and the Royal Irrigation Department in 1976 for trial flood forecasting in the Mae Klong River. The case study of past floods of the Kwae Noi for the period from 1973 to 1975 was carried out by both departments.

40/TCS 50. The report of the preliminary survey by a Japanese team of experts, with the participation of the TCS hydrologist, for the improvement of the Mae Klong River flood forecasting system was completed and forwarded to the Government of Thailand.

The recommendations included in the report were accepted by the Thai Government. Action was being taken by the Thai Meteorological Department and the Royal Irrigation Department so that a second survey, including a transmission test of radio-waves between proposed stations, could be carried out by Japanese experts to prepare a final design of the forecasting network. The matter is under consideration by the competent Thai Government authorities.

The TCG hydrologist visited Bangkok in October 1976 and discussed the follow-up action with the agencies concerned.

C. COMMUNITY PREPAREDNESS AND DISASTER PREVENTION

Joint LRCS/WMO/ESCAP Missions (WRD/TC. 9/10)

51. The Committee noted that the joint LRCS/WMO/ESCAP Mission had carried out follow-up visits to Hong Kong, Philippines, the Republic of Korea and Thailand as requested at the eighth session. Informal discussions had been held with the authorities during the course of one-day meetings in each of the four countries. [It was further noted that the Joint Mission had been warmly received by the member countries which had made careful and effective advance arrangements for the meetings.]

52. The Committee was informed of the main points discussed in each country and of the conclusions reached, as summarized below:

Hong Kong

Consideration was being given in Hong Kong to the setting up of a policy group to advise the Government on disaster prevention and preparedness matters. [It would have no operational or co-ordination functions but would hold regular meetings and try to improve contingency plans.] The Hong Kong participants in the Tokyo Regional Seminar on Community Preparedness and Disaster Prevention had made three recommendations to the Government as a consequence of the seminar:

- (i) A review to be made to ensure that the maximum was done to remove people from risk;
- (ii) A standing committee be set up to keep CP/DP arrangements in Hong Kong under review;
- (iii) Departmental emergency instructions in Hong Kong to be reviewed, not to combine them into a single manual

but to see that they are drawn up in accordance with a common pattern.

One of the recommendations of the 1973 Joint Mission had been for a dedicated meteorological broadcast but the case for it had not been considered strong enough. Because the same problems still existed and requests for technical information could not be met in times of emergency, the meeting considered that a further examination of the possibility of establishing the broadcast should be made by the authorities as soon as possible.

Philippines

The discussions revealed that the major problem in the Philippines remained the effective dissemination of typhoon warnings. In outlying areas the population was unprotected because of long delays in getting the warnings to these areas. [The causes of these delays were re-examined in the light of the facilities available through the Bureau of Telecommunications (BOT) and other circuits. The vital importance of immediate action to improve the arrangements was agreed by all present. It was accordingly recommended that PAGASA, taking into account the recommendations already made by TCS and the Joint Mission, in close co-operation with all the national bodies concerned, should:

- (i) Develop an interim communication plan which would make use of all available telecommunication circuits to ensure the timely and effective dissemination of typhoon warnings;
- (ii) Initiate the studies necessary for the later adoption and implementation of a national typhoon warning

communication system capable of alerting those responsible for the protection of human life and property throughout the territory of the Philippines.

Reference was also made to training programmes in disaster preparedness being carried out in many areas of the Philippines by government agencies and by the Philippine National Red Cross.

During the discussion of this item by the ninth session, the representative of the Philippines informed the Committee of the steps being taken by his country since the Joint Mission visit to improve the dissemination of typhoon warnings. Arrangements were being made to tap all available radio broadcast capability to build up an emergency broadcast system covering the entire country at national, regional and local levels. The Office of Civil Defense had organized a Committee on the Warning System to co-ordinate all existing communication systems to effect a fast and efficient dissemination of warning information. A public information campaign was also being carried out.

Republic of Korea

Since the previous visit of the Joint Mission (June 1975) there had been a major development in the Republic of Korea in the setting up of a new Civil Defense Headquarters in October 1975. This HQ had been given responsibility for a unified national disasters policy at the central level though the various ministries concerned retained their individual responsibilities for specific disaster situations. A new national civil defense plan was under preparation.

Command Post Exercises had again been held successfully over a period of three days and two nights in May 1976 (Disaster

Prevention Month). When visiting the Disaster Prevention Control Room the Mission was informed that the meteorologist on duty there had to rely on the telephone or a messenger service to obtain up-to-date weather information from the Central Meteorological Office. The situation was not considered to be entirely satisfactory and the installation of a facsimile receiver in the Control Room was recommended. It was noted that the recommendation of the Joint Mission for a "hot-line" between the Korean National Red Cross and the Control Room had been implemented. It was suggested, however, that more contact between government agencies and KNRC at the working level was desirable.

Thailand

The meeting revealed that the principal development in Thailand had been the replacement of the former National Committee for Disaster Preparedness (NCDF) by a new, enlarged committee under the "National Civil Emergency Plan (NCEP)". A description of its functions was given. Community preparedness was being handled by a sub-committee on civil defense preparedness. Although the 1973 Joint Mission's main recommendation had not been fulfilled, it was stated that since the Mission there had been greatly increased co-operation between the bodies concerned in carrying out preparedness and relief activities. The need to continue following up the recommendations was also emphasized. The meeting felt that an over-all CP/DP plan might be reached by integrating numerous small plans drawn up by departments or agencies.

Consideration might therefore be given to forming sub-committees and working groups for specific aspects of CP/DP, WMO and ESCAP would assist and advise as appropriate. It was agreed that liaison with these and other international organizations could be arranged with the Meteorological Department through the Local Administration Department.

53. A general point made to the Joint Mission during the course of its visits was the need for Mission reports to be made available to all concerned. The full reports were therefore submitted to the ninth session in document WRD/TC.9/10, copies being distributed also to each participant in the meetings held in the countries. The Committee endorsed the decision of the participating organizations in this respect, requesting that they should continue the practice with future reports.

54. The interest shown by the countries visited by the Joint Mission, as evidenced by the reports of the visits and the comments made at the ninth session, was considered to indicate the continuing value of such visits. In expressing its thanks to the organizations for making staff available for this work, the Committee requested LRCS, WMO and ESCAP to pursue these activities whenever suitable opportunities occurred.

Regional Seminar on Community Preparedness and Disaster Prevention (WRD/TC.9/9)

55. The report of the ESCAP Regional Seminar on Community Preparedness and Disaster Prevention, organised with the co-operation of WMO, LRCS and TCS, was examined by the Committee. The Seminar, which was held at Tokyo from 14 to 29 June 1976 had been attended by

21 participants from 13 countries, including eleven from six member countries of the Typhoon Committee, and by representatives of UNESCO and UNDRO. The programme for the Seminar had been in three main parts, lecture sessions interspersed with group work, a study tour and local visits, and an evaluation session. Participants had also been required to present a short country paper to illustrate some aspect of their national experience in coping with tropical cyclones and floods.

56. The Committee was pleased to learn that the evaluation session indicated that the participants had all benefitted from the experience in one way or another. In general, participants had been extremely impressed with the well developed and planned prevention programme in Japan which had provided many new ideas and techniques for use in their countries. Suggestions for follow up action were made by the participants as shown below:

- ✓ (a) the report of the Seminar should be formally submitted to their countries;
- ✓ ESCAP (b) the participants should report to ESCAP through their Governments on the achievements made during the next 12 months;
- (c) Similar seminars should be organized at regular intervals of three to five years;
- ✓ (d) recommendations should be made by the participants to their Governments for the improvement of their countries' disaster prevention and community preparedness measures on the basis of the conclusions reached at the seminar.

57. In its consideration of these suggestions, the Committee first recorded its view that the true success of the Seminar resided in what further steps were taken in the countries themselves to use the lessons gained by participants. As regards (a), the Committee felt that this proposal had already been partly met by the submission of the Seminar report to the ninth session, and by its distribution in final form to all participants. Such further action as was necessary could very well be taken in conjunction with (d), which was fully supported by the Committee. It further proposed that the participants should inform ESCAP of the recommendations made and of the action subsequently taken on them, as called for under (d). Information of this type should be consolidated by ESCAP with the help of TCS into a summary report made available to all members of the Committee.

58. With regard to (c), the Committee was of the view that the organization of similar seminars would be of considerable value. It therefore supported the proposal and requested ESCAP, in co-operation with WMO, LRCS and TCS to investigate the possibility of holding a second seminar in about 1980. The Committee also drew attention to the usefulness of countries holding "echo-seminars" at which the experience gained by participants could be shared with a larger number of national staff. In this connection the Committee was informed that LRCS was already planning such "echo-seminars" at the national level. They would be carried out by the National Red Cross Societies present at the Tokyo Seminar in close co-operation with interested Governmental and Non-governmental agencies. The League would provide guidance in the organization and conduct of these

"echo-seminars".

59. The representation^{ve} of LRCS gave the Committee a brief description of the South Pacific Disaster Preparedness and Relief Seminar held at Suva, Fiji in September 1976.

60. Finally, under this subject, the Committee wished to place on record its appreciation of the support provided by the Government of Japan which had made the Tokyo Seminar possible.

Guidelines for disaster prevention and preparedness in tropical cyclone areas

61. At its eighth session, the Committee had been informed of the action taken by ESCAP, WMO, LRCS and TCS to compile a manual providing guidance on the organization of effective systems for disaster prevention and preparedness. It was recalled that an Editorial Board had been set up to assume responsibility for the project, consisting of representative^s of each of the four bodies taking part. In the year that had elapsed since the eighth session the Board had held three meetings (Bangkok, November 1975; Madras, April 1976; Geneva, September 1976), examining each portion of the draft text, and finally approving the version prepared by the editor appointed earlier in 1976.

62. The Committee learned with pleasure that UNDRO had assisted in the preparation of the Guidelines both by commenting on the draft texts and by participating in the last two meetings of the Editorial Board. Its assistance in this way had been greatly appreciated; it had also provided valuable guidance in determining the meanings to be given to various terms used throughout the Guidelines and, notably, those of "disaster prevention" and "disaster preparedness". The

Committee welcomed that move towards a more standardized use of the many terms current in connexion with disaster prevention and preparedness. It was noted that the title of the publication and the arrangement of its contents had been modified to correspond to the meanings adopted.

63. The arrangements being made for the printing of the Guidelines were explained to the Committee. It was expected that the publication would be available in the first half of 1977. The Committee expressed its satisfaction to WMO, ESCAP and LRCS, and to the members of the Editorial Board and the Editor, for the efficient way in which the Guidelines had been completed in a relatively short period. It requested the organizations to ensure that it was given the widest possible distribution amongst persons concerned with the organization and operation of disaster prevention and preparedness systems.

64. A copy of the draft Guidelines was displayed during the session.

Other Matters

65. On behalf of the United Nations Disaster Relief Co-ordinator, the UNDRO representative re-affirmed his organization's continuing interest in and active support for the Committee's objectives and programmes. In particular, he expressed its desire to collaborate in the application of tropical cyclone and flood forecasting and warning systems to comprehensive disaster preparedness and preventive measures. In this connection he stated that, funds permitting, UNDRO would consider requests for technical co-operation in 1977 from

member countries of the Committee and *for services in TCS*.

66. UNDRO's activities in pre-disaster planning and prevention

UNDRO was also requested to consider the possibility of providing a short-term consultant with travel funds to work with TCS, preferably in 1976, to facilitate review of follow-up action on the Joint LRCS/WMO/ESCAP mission and Tokyo Seminar recommendations. The representative of the TCS...

since the Committees last session were reviewed briefly and an appeal made to member countries to complete and return the questionnaires for the World Survey of Disaster Damage where they had not already done so. The UNDRO representative stressed the increased importance which UNDRO was attaching to devising and improving methods of disaster damage assessment and composite risk analysis for disaster-prone developing countries partly as an outcome of a ^{suggestion} ~~request~~ made by the Panel on Tropical Cyclones. Specific proposals for the production of guidelines for disaster damage assessment and composite risk analysis were currently being formulated by UNDRO. The active collaboration of UNEP, WMO, UNESCO, the Regional Economic Commissions and other agencies ^{concerned} of the United Nations system would be sought as soon as more proposals were finalised.

67. Lastly, the representative of UNDRO expressed his organization's pleasure in having been associated with the Guidelines project, especially in reviewing and finalising texts on the comprehensive aspects of prevention and preparedness. UNDRO was convinced that the Guidelines constituted an important step forward in achieving an integrated approach to disaster prevention.

68. The attention of the Committee was drawn to the desirability of changing the title of the component of its programme at present called "Community preparedness and disaster prevention" to "Disaster prevention and preparedness" to be consonant with the meanings adopted for the terms in the Guidelines. The Committee agreed to this change considering that, for the time being at least, there was no need to make a corresponding amendment to Article 6(c) of its statute.

D. TRAINING

69. In pursuance of the offer made at the eighth session, the Government of Japan organised group training courses in river engineering and in radar meteorology for four months each. Most of the member countries of the Typhoon Committee had sent participants to these courses. The Committee recorded its appreciation to the Government of Japan. X

70. The representative of Japan informed the Committee that similar group training courses in river engineering and in meteorology would be organised at Tokyo during 1977. In response to a query whether maintenance of weather radar could be the subject of the next training course in meteorology, the representative of Japan informed the Committee that there might be some difficulties in organising such a course. However, he said that this matter would be given further consideration.

✓ 71. Recalling the offer of assistance made at the eighth session by France, USSR and the United States of America, and earlier offers made by Australia and the Federal Republic of Germany, it was reported that several member countries had taken advantage of those offers. Thailand had received in 1976 four fellowships from Australia in hydro-meteorology, weather forecasting and satellite meteorology and two from the Federal Republic of Germany in telecommunications. Philippines and Korea received fellowships from the United States and Japan respectively. The representative of Malaysia expressed gratitude for receiving

several fellowships from Japan.

72. The representatives of France and the United States renewed their earlier offers of assistance for training of personnel in meteorology and hydrology under bilateral assistance programmes or through VAP.

73. Attention was drawn to the decision of the Seventh WMO Congress that VAP assistance would in future be available for short-term fellowships in addition to long-term fellowships, and for WWW application to hydrology, including relevant fellowships in hydrology.

The representative of the United States stated that while long-term fellowships under VAP are offered for B. Sc. degree courses, short-term fellowships, such as for maintenance of equipment, could also be considered under VAP.

74. The eighth session was informed that the Government of the Philippines had notified WMO of the availability of meteorological training facilities leading to an M.Sc. Degree at the University of the Philippines as a contribution to VAP. The Committee noted with satisfaction that four candidates from neighbouring countries had already taken up such fellowships and that another request from Burma had been accepted for 1977.

75. The Committee was informed that a proposal from the Philippines for a post-graduate research fellowship for Ph.D. studies in tropical dynamic meteorology had been accepted under WMO's regular budget. The fellowship will begin in January 1977 at the University of Reading in the U. K.

76. As requested by the Committee at its seventh session, WMO had submitted to UNDP proposals for holding two seminars for countries in Asia, namely; on hydrological forecasting methods including the use of conceptual models and on the use of meteorological satellites. The representative of WMO informed the Committee that there was no positive response yet from the UNDP regarding these seminars and as such no information was available as to when these seminars could be held. He stated that the Executive Committee of WMO had taken some steps to arrange training seminars under WMO's regular programme.

77. A WMO regional seminar for the training of national meteorological instructors for WMO Regional Associations II (Asia) and V (South-West Pacific) had recently been held at Manila. Several member countries had sent participants to that seminar.

78. The representative of France informed the Committee that in addition to the offers for individual fellowships, his country would be willing to organise courses on satellite meteorology in France for which fellowships could be obtained through WMO VAP or through French Embassies. These courses could be organized in English if required. The Committee expressed its appreciation to the government of France.

79. The Committee noted with satisfaction that the Telecommunication and Electronics expert of the TCS had given on-the-job training in the Philippines and in Korea.

80. The representative of ESCAP informed the Committee of the advantages of organising Roving Seminars which permits participation of a larger number of trainees and orientation to meet the needs of individual countries, ~~but involving less total expenditures~~. He cited examples of such roving seminars organised by ESCAP in recent years, which had proved to be very useful.

~~81~~ 80. In conclusion, the Committee considered the various sources of assistance that could be utilised for training of personnel and listed the following main possibilities:

- (a) UNDP fellowships;
- (b) Long-term and short-term fellowships under WMO/VAP and the WMO regular budget;
- (c) Fellowships supported by other international organisations, such as UNDRO;
- (d) Fellowships under bilateral aid programmes;
- (e) Group training courses (e.g. in Japan);
- (f) Regional Seminars (UNDP, WMO or other sources of funding);
- (g) Roving seminars, such as those organised by ESCAP;
- (h) On-the-job training by experts.

E. RESEARCH

82. The Committee was informed that the fifteenth annual report on research work in tropical meteorology containing abstracts and a bibliography compiled by WMO had been circulated to all countries in September 1976.

83. The Committee was informed of the research studies initiated under various sub-projects of the WMO Tropical Cyclone Project. A status report on the implementation programme, including objectives, mode of implementation and status as at 31 July 1976 of each of the sub-projects, had been distributed by WMO. The Committee noted with satisfaction that members of the Typhoon Committee and the TCS were participating in 7 out of the 11 sub-projects. The representative of Hong Kong informed the Committee that his country had provided the team leader for sub-project No. 2 of the WMO Tropical Cyclone Project on "observations from mobile ships" and that a report on this sub-project has already been submitted to WMO. The report identified certain deficiencies in the collection of ships' observations and contains recommendations which may be of interest to the member countries.

84. The Committee noted with satisfaction that the Royal Observatory, Hong Kong, continued to produce objective forecasts of typhoon tracks by computer programming by selected techniques and that these forecasts were being disseminated to member countries from September 1975. Several members expressed appreciation of their usefulness in operational typhoon forecasting.

85. The representative of the Philippines informed the Committee of the progress made under the research project entitled "Development of design criteria and methodology for low-rise-low cost building to better resist extreme winds". This multi-national project was being carried out by the United States, Jamaica, Bangladesh and the Philippines, with its focal point in the Philippines. Additional data were collected during the passage of tropical cyclones across the Philippines in 1976 and the data were being analysed for possible amplification of the papers presented in the regional seminar held at Manila in May 1975.

TCS 86. The Committee was informed that under the typhoon research project of the Philippines, operational testing of a barotropic model for forecasting typhoon movement was being carried out. The results were presented in a lecture at the WMO Regional Seminar for the Training of National Instructors held at Manila just before the ninth session. A technical paper on that subject would be distributed to the member countries in due course.

87. The status of the typhoon moderation programme of the Philippines was given in a lecture presented during the scientific session. A weather modification experiment had been carried out over central Luzon covering an area of about 6000 km² during January - June 1976 as a follow-up to the first experiment in April - May 1975. The 1976 experiment was aimed at further evaluation of the effectiveness of cloud seeding and also for the field training of personnel associated with the programme.

88. In accordance with a decision of the eighth session, copies of a report prepared for the WMO Commission for Hydrology by a French specialist, Mr. Trendel, on the estimation of precipitation resulting from tropical cyclones were circulated by WMO to the member countries in March 1976.

89. The Committee was informed of the progress made through joint collaboration in studies of objective techniques of typhoon forecasting and of storm surges, initiated last year and reported at the eighth session. The co-ordinators presented lectures on these topics at the ninth session summarizing the progress made to date.

90. A tentative scheme for the joint study of tropical cyclones movement prediction by objective techniques was prepared by the coordinator, Dr. P. C. Chin (Hong Kong) and circulated to member countries for comments and suggestions. In response Japan, Philippines, Republic of Korea and Thailand indicated their willingness to participate in the studies. Dr. Chin had recently visited Tokyo to discuss the matter with those concerned at JMA. Further discussion with PAGASA officials and TCS would be held immediately after the session. The Committee expressed its appreciation to the Government of Hong Kong for enabling Dr. Chin to visit Japan in the absence of other sources of funding. It reiterated the decision made at its eighth session that it would be necessary to seek funds for visits of that type.

91. Dr. Miyazaki (Japan), Co-ordinator for the joint study on storm surges had sent a questionnaire to the research

correspondents in member countries. Based on the information collected, a detailed circular was prepared on existing facilities, suggestions for improvements and plans for co-operative studies in the respective countries. The representative of the Philippines informed the Committee that ~~that~~ it was trying to implement some of those suggestions including improvement of the tide gauge network.

92. The Committee noted with interest that Dr. Miyazaki had also acted as team leader for the sub-project on storm surge prediction of the WMO Tropical Cyclone Project and that the final draft of the manual on storm surge prediction prepared by the team was being edited for publication shortly.

93. The Committee was informed that the Royal Observatory, Hong Kong, had set up a storm surge unit to study the tidal and storm surge phenomena around Hong Kong using numerical techniques and that the Royal Observatory had published a technical note describing a statistical method for determining the probabilities of coincidence of storm surges and astronomical tides, and hence the return periods for flooding of different magnitudes.

TCS 94. In view of the special importance of storm surges as a cause of typhoon damage, the Committee urged member countries to intensify studies and to co-operate fully in the studies being undertaken by the Committee.

101/ELCMT 95. A suggestion that visits of research workers to other countries would be very useful for the exchange of scientific information was generally supported by the Committee. It accordingly

requested WMO, ESCAP and TCS to organize such visits whenever suitable opportunity arose.

5440/TCS 96.

The Committee also endorsed the proposal submitted at the session under agenda item 8 for studies to be conducted on.

- a) testing of various hydrological forecasting models leading to adoption of those most suitable for tropical cyclone areas; and
- b) disaster risk studies in selected countries, including flood risk mapping, rainfall frequency associated with tropical cyclones and other processed data needed for disaster risk evaluation.

III. UNDP TECHNICAL SUPPORT TO THE REGIONAL TYPHOON PROGRAMME

(a) FOR THE PERIOD 1974 - 1976
(WED/TC.9/4)

97. The Committee was pleased to note that the project entitled "Technical Support to the Regional Typhoon Programme", which was approved for a period of three years (1974-1976), had progressed satisfactorily and ^{that} most of its components had either been implemented or were under implementation. The total UNDP contribution amounting to \$US 720,900 included the services of three international experts at the Typhoon Committee Secretariat (TCS), five fellowships for one year each, and equipment at a cost of \$US 350,000.

98. The estimated government contribution to the project amounting to the equivalent of \$US 435,760 included local costs for the implementation of the programmes, provision of facilities and supporting personnel for the TCS, and for counterpart professional staff at the TCS.

Progress in the implementation of the project

99. The budget for the Regional Typhoon Project was revised to reflect the final expenditures for 1974 and 1975 and with an expenditure ceiling approved for 1976, the total UNDP contribution amounted to \$US 706,253 for the period 1974-1976.

100. The Committee was informed of the progress made in the implementation of the project under its main components as summarized

below:

(a) Equipment component

101 Telecommunication and radar ancillary equipment worth \$U.S. 301,346 financed by UNDP were ordered by WMO of which equipment worth \$U.S. 264,559 had already been delivered to the countries concerned. The remaining equipment was expected to be received shortly.

102 The Committee noted with satisfaction that three sets of radar picture transmission equipment had been installed in the Philippines with the assistance of the telecommunication and electronics expert of the TCS. The equipment were demonstrated to PAGASA officials by arranging test transmissions from the radar stations.

103 Republic of Korea received radar test equipment and teleprinter spare parts in 1975 and eight sets of teleprinter in 1976. This equipment was tested and put into use with the assistance of the telecommunications/electronics expert of the TCS during his visits in 1975 and 1976.

104 Telecommunication equipment worth \$U.S. 48,000 was received by the Meteorological Department of Thailand in 1976. The installation of the equipment, intended to strengthen the RTH at Bangkok, was in progress. The Meteorological Department of Lao People's Democratic Republic received eight sets of 100 W SSB transceivers each with a 1 KVA power generator to be used for improvement of the national data collection system.

(b) United Nations experts

105 The Committee was informed that the services of the three United Nations experts were available throughout the period of the project as scheduled. The experts rendered advisory services and assisted the member countries in the implementation of all components of the Committee's activities.

(c) Fellowships

106 The Committee was pleased to learn that of the five fellowships of one year each earmarked for five member countries (Democratic Kampuchea, Lao People's Democratic Republic, Philippines, Republic of Korea and Thailand), fellowships for three countries had been completed as follows:

1. Lao People's Democratic Republic : three fellowships
for four months each in Thailand (completed in 1975)
2. Philippines : one fellowship for one year in the
United States (completed in 1976)
3. Republic of Korea : one fellowship for one year in
Japan (completed in 1976)

107 A nomination was received from Thailand for one fellowship for six months training in repair and maintenance of APT equipment in the United States. Processing of this fellowship was in progress and it was expected to commence before the end of 1976.

The other fellowship for six months for Thailand and the one year's fellowship earmarked for Democratic Kampuchea could not be implemented during the current project period.

(d) Counterpart Contribution

TCS 108 The Committee noted with satisfaction that the Philippines continued to provide the host facilities for TCS. Premises for TCS, office equipment, furniture, one vehicle and the supporting staff (secretaries and drivers) continued to be provided by the government of the Philippines. Philippines also assigned a counterpart meteorologist to work in TCS from November 1975, and Japan was planning to provide a hydrologist *early in 1977.* The Committee expressed its sincere appreciation to the governments of the Philippines and Japan for their generous support.

109 Counterpart staff and office facilities needed for operation of the pilot flood forecasting systems in the Republic of Korea and the Philippines and staff required for the operation of telecommunication and radar ancillary equipment in the Republic of Korea, Philippines and Thailand were provided by the respective governments.

(e) Bilateral Assistance

110 Attention of the Committee was drawn to the fact that the bilateral assistance already received by the Committee and further assistance required would be dealt with in more details under

Agenda Item 6 "Contributions to the Regional Typhoon Programme from sources other than UNDP."

111. The Committee was informed that the total bilateral assistance to the project activities received during 1974 - 1976 had been substantial, the most significant being the loan of US\$1.5 million for the purchase of equipment for implementation of the pilot flood forecasting system in Korea. Other assistance, either bilateral or through WMO VAP, included provision of equipment by Japan, USSR, Federal Republic of Germany; training facilities in Japan, Australia, France and the United States, and the operation of ocean weather ships in the West Pacific by the USSR. Financial assistance by Japan for holding a regional seminar on community preparedness and disaster prevention was also mentioned in this connection.

112 The Committee was pleased to learn that in connection with the implementation of pilot flood forecasting systems in the Lao People's Democratic Republic and in Thailand, the report of a preliminary survey carried out by a team of Japanese experts with the assistance of TCS hydrologist was sent to the countries concerned in July 1976. Further assistance was expected from Japan for these projects in response to the requests submitted by the two countries.

113: Further bilateral assistance had been offered recently in the form of equipment or training facilities. These offers of assistance were reported to be in various stages of implementation.

114. The Committee expressed its gratitude to the UNDP for its technical support to the Regional Typhoon programme. It also wished to record its appreciation for the work carried out by the TCS in implementing the various components of the UNDP project and the other programmes of the Committee.

(b) For the Period 1977 - 1981

115. The Committee noted that in accordance with decisions of its eighth session a submission had been made to UNDP by WMO in May 1976, the total estimated cost of the UNDP contribution over the five-year period being \$678,500, of which \$560,000 was the expert component.

116. The representative of the UNDP informed the Committee of recent decisions of the UNDP Headquarters on allocations for this programme as follows:

For 1977 - A ceiling of \$140,000, comprising 12 man-months of Chief Technical Adviser, 12 man-months of Telecommunication Electronics Expert, miscellaneous expenses, (\$2,000), and a motor vehicle, subject to firm establishment of need.

For 1978 - 12 man-months of Chief Technical Adviser; 4 man-months Consultant services.

No support of the programme was intended by UNDP from 1 January 1979.

117. The Committee established itself as a Committee of the Whole to discuss the implications of this information on the funding of the Committee's activities, in particular with respect to the TCS, and subsequently expressed the following views and reached conclusions as indicated below.

WMO/ESCAP
118. The Committee recorded its deep concern at the early phasing out of the UNDP support, and the reduced allocation of actual resources in 1977, compared with earlier advice that the financial allocation was only \$6,000 less than the amount sought in the

submission. The lateness of this advice made it extremely difficult to obtain funds from other sources to meet the stated requirements.

WMO/ESCAP
119.

Recalling the various resolutions at the UN General Assembly on the mitigation of tropical cyclone damage and loss of life, the Committee requested the representative of UNDP to urge its Headquarters to reconsider the proposed allocations, particularly for the period 1979-1981, in the light of possible changes in available funding, and to increase the allocations if at all possible for the period 1977-1978. It noted with satisfaction that the governments of several members of the Committee would consider making representations to the UNDP governing bodies along the lines indicated above.

WMO/ESCAP

120. In the light of the information received the Committee reviewed the assessment of resource requirements as determined at its eighth session and as incorporated in the submission to UNDP. It agreed that this was still substantially a minimum requirement for the proper functioning of its Secretariat and for development of its regional activities, and in order to provide a picture of the corresponding financial implications agreed on the requirements as set out in Table 1. These requirements constituted the regional component of the Committee's programme, and represented vital support to the national components of the programme.

WMO/ESCAP

121. In this light the Committee agreed that the continued provision of an internationally recruited Chief Technical Adviser as Chief of its Secretariat was essential for the maintenance and development of its programme. Similarly the services of the internationally recruited Telecommunication Expert were required through 1979, after

Table 1

Regional Programme
Resource Requirements, Values⁽¹⁾ and Sources

I T E M	1977		1978		1979		1980		1981	
	Source	Value	Source	Value	Source	Value	Source	Value	Source	Value
Chief Tech Adviser	: UNDP	: 46,000	: UNDP	: 46,000	: Internat. ⁽²⁾	: 46,000	: Internat.	: 46,000	: Internat.	: 46,000
Telecom Expert	: UNDP	: 46,000	: Internat.	: 34,000	: Internat.	: 34,000	: Members ⁽³⁾	: 8,000	: Members	: 8,000
Travel	: UNDP	: 10,000	: UNDP	: 5,000	: Members	: 10,000	: Members	: 10,000	: Members	: 10,000
	:	:	: Members	: 5,000	:	:	:	:	:	:
Equipment	: Internat.	: 25,000	: Internat.	: 25,000	: Internat.	: 25,000	: Internat.	: 25,000	: -	: -
Meteorologist	: Members	: 8,000 ⁽³⁾	: Members	: 8,000	: Members	: 8,000	: Members	: 8,000	: Members	: 8,000
Hydrologist	: "	: 8,000 ⁽³⁾	: "	: 8,000	: "	: 8,000	: "	: 8,000	: "	: 8,000
Travel	: "	: 10,000	: "	: 10,000	: "	: 10,000	: "	: 10,000	: "	: 10,000
Consultant (4 mm / year)	: Internat.	: 16,000	: UNDP	: 16,000	: Internat.	: 16,000	: Internat.	: 16,000	: Internat.	: 16,000
Host Facilities	: Members	: 35,000	: Members	: 35,000	: Members	: 35,000	: Members	: 35,000	: Members	: 35,000
T o t a l	:	: 204,000	:	: 192,000	:	: 192,000	:	: 166,000	:	: 141,000
	: UNDP ⁽⁴⁾	: 102,000	:	: 67,000	:	: -	:	: -	:	: -
	: Internat.	: 41,000	:	: 59,000	:	: 121,000	:	: 87,000	:	: 62,000
	: Members	: 61,000	:	: 66,000	:	: 71,000	:	: 79,000	:	: 79,000

NOTE (1) Estimates are based on costs as at 30 November 1976, and do not include any provision for cost escalation.

(2) "International" indicates external sources other than UNDP.

(3) The figure of \$8,000 is used as an indication of cost per annum for staff seconded by members, assessed in terms of salaries in the host country; actual costs to the countries contributing expert services would, on the average be expected to be much higher.

(4) The figures given do not include the small "miscellaneous" allocation, or the amount for a vehicle in 1977.

which it was considered that provision should be made for his position to be filled by an expert from a member country. This would represent a reduction by two years in dependence on external funding for this position. In view of the proposed increasing use of personnel provided by members, it was considered important to have continued access to international consultant services in selected topics, for which external funding would be needed. It was also agreed that the provision of \$25,000 from external sources for emergency spare parts and equipment items was most important for the regional programme. The total estimated requirements from international sources are also summarized in Table 1.

122. Since the members were unable to meet the cash cost of the international services referred to above, the Committee requested WMO and ESCAP to investigate all possibilities of donors which might provide assistance in this support for the Committee's programme.

123. At the same time the Committee agreed that in the light of the drastic curtailment of UNDP support, the member countries would need to make additional efforts to supplement the resources available for the regional programme, and in addition to providing a Telecommunication expert from a member country in 1980-81, agreed that member countries should also meet the cost of travel of staff other than those funded by UNDP. The Committee noted with appreciation the statement by the representative of the Philippines that it was expected that his government would continue to provide host facilities for the Secretariat as a donation to the Committee's programme.

124. In relation to the costs to be borne by the member countries, the Committee noted that on the basis of the figures in Table 1, and having regard to the generous offer of the representative of the Philippines to continue to make available host facilities, the costs to be met by members for each of the 5 years would be respectively;

1977	1978	1979	1980	1981
\$26,000	\$31,000	\$36,000	\$44,000	\$44,000

125. It was agreed that these costs should be allocated with due regard to the incidence of typhoons, their impact on national economics, and economic resources of the countries concerned, and the following figures were agreed upon (Table 2), as proposed contributions in cash or in kind, as support for the regional component of the programme.

Proposed Contributions in Cash or in Kind by Member Countries
Present at the Ninth Session

C O U N T R Y	:	%	A N N U A L A L L O C A T I O N S				
			1977	1978	1979	1980	1981
Hong Kong	:	10	: 2,600	: 3,100	: 3,600	: 4,400	: 4,400
Japan	:	40	: 10,400	: 12,400	: 14,400	: 17,600	: 17,600
Republic of Korea	:	10	: 2,600	: 3,100	: 3,600	: 4,400	: 4,400
Malaysia	:	5	: 1,300	: 1,550	: 1,800	: 2,200	: 2,200
Philippines	:	30	: 7,800	: 9,300	: 10,800	: 13,200	: 13,200
Thailand	:	5	: 1,300	: 1,550	: 1,800	: 2,200	: 2,200
T o t a l	:	100	: 26,000	: 31,000	: 36,000	: 44,000	: 44,000

126. In considering the proposed contributions by members present at the meeting, the Committee noted that these contributions could be reduced in the light of contributions that might be made by other members of the Typhoon Committee.

WMO/ESCAP
127. Representatives of several countries stated that they had no authority to commit their governments on this matter. It was recognized that these proposals would need to be submitted to governments for consideration, and the Committee requested WMO in consultation with ESCAP to take action accordingly. At the same time representatives of member countries were requested by the Committee to initiate consideration of this proposal by their respective Governments.

WMO/ESCAP
128. It was most important that the official position of the governments in relation to these funding proposals be known as soon as possible, and not later than 1 June 1977, so that appropriate documentation concerning the administration of the contributions, both from external sources and from member countries, could be prepared for consideration at the next session of the Committee. The Committee further considered it important that representatives of its members at the next session be in a position to approve, on behalf of their governments, the establishment of arrangements for administration of contributions toward the regional component of the Committee's programme.

129. The Committee noted that while it might appear that there would be special problems in obtaining the resources needed in 1977, the main contributions in kind had already been committed by the respective countries. It was also noted that the costs referred to in Table 2 represented only a part, and in some cases only a very small part, of the contributions likely to be made by member countries in continuing their support of programmes for mitigation of damage from typhoons and floods.

IV. CONTRIBUTION TO THE REGIONAL TYPHOON PROGRAMME FROM SOURCES
OTHER THAN UNDP (WRD/TC.9/6 and WRD/TC.9/6/Corr.1)

130. The Committee noted the information presented in document WRD/TC.9/6 and Corr.1, summarising the main contributions made towards its regional programme by member countries, and through bilateral/VAP assistance.

131. With regard to contributions by member countries, the Committee recognized that many developments and activities implemented primarily for national purposes also made a contribution to regional programmes through the availability of improved data of interest to other countries. The value of continuing and expanding the process of exchange of information on national activities of mutual interest was also stressed. The significance of the contributions of host facilities by the Government of the Philippines, of the services of a meteorologist by the Government of the Philippines starting in November 1975, and of a hydrologist by the Government of Japan to start early in 1977, are mentioned elsewhere.

132. The principal contributions through bilateral/VAP assistance during the period 1969-1976 are summarised in Appendix I.

W/ECMP/TC

133. The Committee also considered the items for which there was a need for external assistance, and agreed on the following summary:

Nature of assistance required from external sources.

I. Items of regional importance

- (a) Facilities for improvement of RS/RW network, particularly in the Philippines and Democratic Kampuchea.
- (b) Establishment of radar stations particularly in Lao People's Democratic Republic and in the Republic of Korea.
- (c) Improvements in collection and exchange of ships' observations, including improvements needed at coastal radio stations
- (d) Continuation of the ocean weather ships (by the USSR) and typhoon reconnaissance flights in the typhoon area (by the United States).
- (e) Automatic marine buoys, (preferably of simple design) for reporting essential elements, at selected locations (eg. to the east of the Philippines).
- (f) Strengthening of Bangkok RTH including provision of additional equipment to ensure prompt collection and dissemination of data.
- (g) Provision of adequate spare parts for maintenance of existing and new electronic equipment (radar, APT and telecommunication equipment).
- (h) Further training facilities in meteorology and hydrology, including short-term courses in flood forecasting and in maintenance of telecommunication and electronic equipment.
- (i) Organisation of seminars of interest to the Committee (e.g. hydrological forecasting, satellite meteorology, radar meteorology, storm surge, etc.

II. Items mainly of national importance

- (a) Facilities for reception^{of}/information from satellites including the GMS to be launched by Japan in 1977.
- (b) Improvements in telecommunication facilities (including provision of additional equipment) for national data collection, particularly in Lao People's Democratic Republic, Democratic Kampuchea and in the Philippines.
- (c) Facilities for dissemination of typhoon warnings within countries, such as by establishing efficient communication links between the Central Warning Centre and the new media (radio/TV stations) and concerned agencies (may be undertaken as a pilot project in the Philippines)
- (d) Establishment of pilot flood forecasting systems in Lao People's Democratic Republic and in Thailand.
- (e) Extension of flood forecasting systems to other river basins in the Philippines and in the Republic of Korea.
- (f) Provision of Consultants in the field of disaster prevention and preparedness
- (g) Improvements in the national training and research organisations, such as by provision of consultants, and establishment of training and research institutes where appropriate, facilitating co-ordinated study of specific problems.

134. The Committee recognised that in some cases effective action could not be taken until local conditions were more favourable for the necessary standards of operation and maintenance of equipment.

135. The Committee noted **that** some additions to these lists might be needed to reflect the new membership of Malaysia.

V. Programme for 1977
(WRD/TC.9/7/Corr.1)

TCS

136. In considering its programme for 1977, the Committee took into account the latest developments in its activities and the schedule of work as envisaged under the UNDP project for the year 1977. Recognizing that a number of national activities of particular interest to the Committee would be carried out by member countries, the Committee directed that special attention be given, with the assistance of TCS, to the following items of work during 1977:

Meteorological Component

- (a) Operation and maintenance of equipment provided by UNDP and also other equipment obtained through national resources or with bilateral/VAP assistance. That included radar picture transmission and telecommunication equipment obtained by the Philippines and Thailand from UNDP, telecommunication equipment to be received by the Philippines from France and by Thailand from the United States and the USSR, 10-cm-radar to be received by Lao People's Democratic Republic from the USSR;
- (b) Provision or improvement of meteorological and telecommunication facilities particularly those included in the priority list established by the Committee;
- (c) Review of existing telecommunication facilities and data exchange needed for the typhoon warning services with a view to taking remedial measures, where necessary;
- (d) Review of the present arrangements for dissemination of typhoon and flood warning with a view to introducing improvements, where necessary;

- (e) Ensure efficient arrangements for calibration and maintenance of weather radar;
- (f) Review and ensure suitable arrangements for reception of satellite meteorological information, including those from the GMS to be launched by Japan in 1977;

Hydrological Component

- (a) Further progress in the establishment of pilot flood forecasting systems in the Lao People's Democratic Republic and Thailand;
- ✓ (b) Development of flood forecasting systems in the Agno, Cagayan, and Bicol River basins in the Philippines, for which assistance had been requested from the Government of Japan;
- (c) Further improvements in the operation of pilot flood forecasting systems in the Pampanga River basin (Philippines) and in the Han River basin (Republic of Korea);
- X (d) Establishment of a hydrometeorological telemetry network in the Marikina basin in the Philippines;

Community Preparedness and Disaster Prevention

- ✓ (a) Follow-up action on the joint LRCS/WMO/ESCAP missions in 1973 and 1974 taking into account the results of subsequent review by informal meetings, with assistance by the TCS consultant, ^{the might be provided by UNESCO.} if available;
- ✓ (b) Initiation of Studies, entitled "The quantitative evaluation of the risk of disaster from tropical cyclones", on disaster risk evaluation in typhoon-prone areas on the basis of guidance material becoming available with the implementation of the WMO Tropical Cyclone Project, sub-project No. 8 - Risk evaluation techniques.
- (c) Publication and distribution of the "Guidelines for disaster

prevention and preparedness in tropical cyclone areas "

- (d) Editing, publication and distribution of the Proceedings of the Regional Seminar on Community Preparedness and Disaster Prevention.
- (e) Follow-up, with the participating countries, the action taken at the National level on the recommendations of the Regional Seminar, including support for the organization of "echo seminars" in the countries through the LRCS.

Training

- (a) Training of personnel through group training courses in Japan and other fellowships through bilateral and VAP assistance.
- (b) Short-term training courses on maintenance of electronic equipment might be given special consideration;
- (c) Participation in seminars of interest to the Committee's programmes;
- (d) On-the-job training by TCS experts in the operation of telecommunication equipment, including radar picture-transmission equipment, and calibration and maintenance of weather radar.

Research

- (a) Stimulation of research activities through advisory services, exchange of information and joint collaboration among member countries. Special attention would be given to the studies of objective typhoon forecasting and of storm surges;
- (b) Contributions to the sub-projects under the WMO Tropical Cyclone Project in which member countries of the Typhoon Committee and TCS are associated.

- (c) Promote exchange of information on typhoon research activities, including research developments on related matters outside the region.
- (d) Initiate provisional studies related to the implementation of quantitative risk evaluation of floods caused by typhoons in the member countries.

137. The Committee agreed that a mission should visit Malaysia as early as possible in 1977 with a view to ensuring the inclusion ^{in the programme} ~~of appropriate items~~ ^{for 1977 and subsequent years.}

VI. CO-ORDINATION WITH THE WMO TROPICAL CYCLONE PROJECT AND
REGIONAL PROGRAMMES
(WRD/TC.9/8)

138. The Committee noted with considerable interest the information contained in the second status report on the implementation of the WMO Tropical Cyclone Project (TCP). It expressed its satisfaction with ^{the} amplification of the report since the first issue, considering that it provided a very useful summary of the activities being carried out under both the global and regional components of the project.

WMO/ESCAP
139. The progress being made with the 11 sub-projects under the global component of the TCP was noted with satisfaction. Of the four sub-projects completed to date, one resulting in the publication of the "Guidelines for Disaster Prevention and Preparedness in Tropical Cyclone Areas", had originated as part of the Typhoon Committee's programme (see parag.). The Committee considered that that publication, as well as the "Guide on Storm Surge Prediction", which had also been prepared as one of the sub-projects of the global component would be of very great value to many countries affected by tropical cyclones. It therefore requested WMO and ESCAP to ensure that both were readily available to all interested institutions and persons. The Committee was further pleased to learn that the studies on observations from mobile ships and on risk evaluation techniques had been ^{completed} terminated. As these and the other sub-projects of the global component were of importance to all the member countries of the Typhoon Committee, the Committee urged WMO to ensure that ^{the uncompleted} these studies were pursued energetically by the scientists, countries and

organizations contributing to them.

WMO/TCS 140 The Committee noted in particular that a manual on "Quantitative Evaluation of Disaster Risks (Tropical Cyclones)" prepared under a sub-project of the global component provided a detailed methodology on the establishment of basic data on risk of loss by cyclone wind, storm surge, flood and river flood for development planning purposes. As this type of study had not been used to any great extent in the member countries of the Committee, it was agreed that the use of this manual should be introduced in the activities of the Committee, possibly on a pilot basis in each country..

The Committee requested WMO, in co-operation with the TCS, to assist in the initiation of such studies at an early date, possibly in 1977.

It expressed the hope that the necessary funds for these studies could be found by WMO, perhaps in co-operation with UNEP which had sponsored the preparation of the manual.

141. The information given in the status report on the regional component of the TCP was reviewed with interest by the Committee which felt that it demonstrated once more the need for a larger exchange of information on operational programmes similar to its own being conducted in other tropical cyclone areas.

142 The Committee noted that the areas where similar regional endeavours have either been initiated or have been in progress for some time were as follows:

- (a) The Bay of Bengal and the Arabian Sea, where the WMO/ESCAP Panel on Tropical Cyclones had held its third session in

1976. In this connexion the Committee was informed of the activities of the Panel by Dr. P.C. Chin (Hong Kong) who had served as Chief Technical Adviser of the Panel's Technical Support Unit for several months in 1976. It noted with satisfaction that the experience gained by the Typhoon Committee had been of great benefit to the Panel. The fourth session was scheduled for April 1977.

- (b) The South-West Indian Ocean, where the WMO RA I Tropical Cyclone Committee would hold its third session in 1977.
- (c) Central America and the Caribbean area, where there had already been long-term activities but where a new project concerned with advanced methods of hurricane forecasting and warning (including flood forecasting) techniques had been launched.

WMO

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The Committee considered that although all these areas have specific conditions of both a meteorological and hydrological, as well as of a social and economic character, several aspects of the activities aimed at mitigating the disastrous effects of tropical cyclones are common to all the areas. For this reason, it considered that under the global component of the WMO TCP an investigation should be made to find the most effective way of ensuring a full exchange of experience and information between the regional components of the Project. It requested WMO to inform the Committee at its next session of the results of this endeavour.

WMO

144. Finally, the Committee considered that the periodic issue of status reports on the TCP was a first important step for such an exchange and requested WMO to continue the preparation of these reports at suitable intervals.

VII. CONSIDERATION OF THE AGENDA FOR THE NEXT SESSION OF THE
COMMITTEE

WMO/ESCAP/TCS
145. The Committee decided to leave the detailed preparation of the agenda for the next session to ESCAP and WMO in consultation with the TCS. It expressed the following views, based on the agenda for the ninth session, requesting that they be taken into account in the establishment of the provisional agenda for the tenth session:

- (a) Present items 5 and 6 to be replaced by a single item covering funding of the regional typhoon programme, with three sub-items to reflect in turn contributions from member countries, UNDP, and other external sources;
- (b) A separate item to be included dealing (i) with the Japanese GMS and its impact on the Typhoon Committee programme, and (ii) the implications of the FGGE for Typhoon Committee activities;
- (c) Consideration to be given to whether the present item 7 on the future programme should precede or follow the item covering available support;
- (d) Item 8 - "Co-ordination with the WMO Tropical Cyclone Project and Regional Programmes" and the new item referred to in (b) above to precede the item on the future programme;
- (e) An additional item "Scientific lectures" to be included.

WMO/ESCAP/TCS
146. In reviewing the documentation produced for the session, and its own report, the Committee urged that every endeavor be made to ensure that all documentation associated with future sessions should be as concise as possible.

WMO/ESCAP
147. The Committee also agreed that WMO and ESCAP be authorized to prepare a summary of the report of its ninth session for distribution at the next session of ESCAP and to other bodies as appropriate.

WMO/ESCAP
VIII. DATE AND PLACE OF THE TENTH SESSION

148. It was decided that the tenth session of the Committee would

be held in the latter part of 1977, taking into consideration the other commitments of WMO and ESCAP. The representative of Japan stated that the possibility of holding the session at Tokyo, would be explored. The Committee welcomed the statement and agreed that it should be held there in the event of the Government of Japan offering to host the meeting.

IX. SCIENTIFIC LECTURES

149. As requested by the Committee at its eighth session, arrangements were made for the inclusion in the programme of the ninth session of the following scientific lectures:

- (i) Storm Surges - Their characteristics and prediction by Dr. Masamori Miyazaki (Japan)
- (ii) Typhoon Moderation Programme in the Philippines - Status report by Mr. Rodolfo A. de Guzman (Philippines)
- (iii) A Diagnostic Approach in Tropical Cyclone Forecasting by objective techniques by Dr. P. C. Chin (Hong Kong))

150. The Committee recorded its thanks to the lecturers for their interesting presentations and its appreciation to the Government of Japan which had made Dr. Miyazaki available especially for the occasion.

151. Finally the Committee discussed possible topics which it felt would be suitable for inclusion in the scientific lecture programme at its tenth session. It was suggested that lectures on the following subjects should, if possible, be arranged:

- (i) A lecture on the Geostationary Meteorological Satellite (CMS) (Japan)
- (ii) Lectures on (a) Flood risk mapping and (b) Alternative uses of different telecommunication systems for flood forecasting systems (U.S.A.)

X. ADOPTION OF THE REPORT

152. The report of the session was adopted at the Committee's final meeting on 29 November 1976.

APPENDIX 1

Bilateral/VAP assistance received by members of the Typhoon Committee during 1969-1976

(a) Meteorological Component

<u>Observing facilities</u>	<u>Members receiving assistance</u>	<u>Type of assistance</u>	<u>Donor country or organization</u>	<u>Implemented (Year) or offered</u>
1. RS/RW at Vientiane	Lao People's Democratic Republic	VAP	Finland	1972
2. RW station at Davao	Philippines	VAP	United States	offered
3. Radar at Vientiane	Lao People's Democratic Republic	VAP	USSR	offered
4. APT at Bangkok	Thailand	VAP	United States	1970
5. APT at Vientiane	Lao People's Democratic Republic	Bilateral	France	1973
6. APT at Phnom-Penh	Democratic Kampuchea	VAP	United States	1975
7. Ocean Weather station (16°N, 135°E)	All members	Bilateral	USSR	Since 1970
<u>Telecommunication facilities</u>				
8. Improvement of national data collection	) Philippines	(i) Bilateral	Australia	1972
	)	(ii) VAP	France	1976
	)	Bilateral	Japan	1976
	) Lao People's Democratic Republic			
9. Bangkok-Vientiane	Lao People's Democratic Republic	VAP	USSR	1974
10. Strengthening of the RTM Bangkok	) Thailand	(i) Bilateral	Federal Rep. of Germany	1976
	)	(ii) VAP	United States	offered
	)	(iii) VAP	USSR	offered
)			

	<u>Members receiving assistance</u>	<u>Type of assistance</u>	<u>Donor country or organization</u>	<u>Implemented (Year) or offered</u>
(b) <u>Hydrological component</u>				
1. Pilot flood forecasting system (equipment & training)	Philippines	Bilateral	Japan	1973
2. Provision of hydro- logist/telecom expert	Philippines	Bilateral	Japan	1973-1976 (periodi- cally)
3. Pilot flood forecasting system (equipment & training)	Republic of Korea	Bilateral	Japan	1974-1975
4. Preliminary survey for flood forecasting	Lao People's Democratic Republic and Thailand	Bilateral	Japan	1975
(c) <u>Disaster prevention</u>				
1. Survey	All members	Consultant	WMO, LRCS	1971-1972
2. Joint Mission	Hong Kong, Thailand, Republic of Korea, Philippines and Japan	Assign- ments	LRCS/WMO/ ESCAP	1973-1974 1975-1976
3. Preparation of guidelines	All members	Assign- ments and Financial	LRCS/WMO/ ESCAP	1975-1976
4. Regional seminar	All members	Financial	Japan	1976
(d) <u>Training</u>				
1. Group training courses in hydrology	All members	Bilateral	Japan	Since 1969 (annually)
2. Group training courses in meteorology	All members	Bilateral	Japan	Since 1972 (annually)
3. Fellowships	(Republic of Korea, Philippines, Lao People's Democratic Republic, and Thailand	Bilateral/ VAP	(USA, USSR, (France, (Australia, (Federal (Rep. of (Germany	1969-1976 further assistance offered

22 November 1976

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC
AND
WORLD METEOROLOGICAL ORGANIZATION

Typhoon Committee
Ninth session
23-29 November 1976
Manila, Philippines

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WMO

FOR PARTICIPANTS ONLY

WRD/TC.9/9
1 September 1976

ORIGINAL : ENGLISH

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC
AND
WORLD METEOROLOGICAL ORGANIZATION

Typhoon Committee
Ninth session
23-29 November 1976
Manila

REPORT OF THE REGIONAL SEMINAR ON COMMUNITY PREPAREDNESS
AND DISASTER PREVENTION

(Item 4(c) of the provisional agenda)

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I. BACKGROUND

1. A few years ago, the Typhoon Committee, jointly sponsored by the Economic and Social Commission for Asia and the Pacific (ESCAP) and the World Meteorological Organization (WMO), decided to augment its activities in community preparedness and disaster prevention. One of the outcomes of that decision was the setting up of a Joint LRCS/WMO/ESCAP Mission with the purpose, in the broadest sense, of advising member countries on the improvement of their protective system.
2. In 1974, the Joint Mission was asked to visit Japan to study the organization of the very advanced disaster prevention and preparedness system there to see how the experience acquired could be applied in other countries. The Mission was so impressed by what it saw and learned in Japan that it felt it would be of immense value for others to have first-hand experience of the methods used to minimize the effects of disasters. One of the recommendations that the Mission made to the Government of Japan before leaving the country, therefore, was that a regional seminar on community preparedness and disaster prevention be organized as soon as possible.
3. The Government of Japan responded rapidly and positively to that recommendation, making it possible for ESCAP to undertake the organization of the seminar as part of its work for the mitigation of tropical cyclone and flood damage.

II. INTRODUCTION

4. The Ministry of Foreign Affairs served as the co-ordinating agency for the organization of the seminar in Japan. A Programme Director was appointed by Japan and a Co-Director was provided by the ESCAP secretariat. LRCS, WMO and the Typhoon Committee secretariat (TCS) were invited to co-operate in the preparation and conduct of the seminar; a Co-Director was designated by each.
5. The Seminar was divided into three parts. The first part consisted of lecture sessions interspersed with group work, and the presentation of country papers. The second part covered a three-day study tour to sites of interest in the Nagoya-Osaka area. The third and last part was devoted to a short session to evaluate the results of the Seminar and formulate conclusions to guide the future work of the participants in their own countries.

6. The lecture sessions covered a wide range of topics, beginning with lectures on the background to the warning system and the economic aspects of tropical cyclone and flood damage. Disaster legislation and the co-ordination of national disaster prevention activities were then dealt with, followed by pre-disaster preparation and planning, public information and education, and finally, relief and rehabilitation. The lectures were followed by discussions, visits to places of interest and films.

III. ATTENDANCE

7. The Seminar, which took place at Tokyo from 14 to 29 June 1976, was attended by 21 participants nominated by 13 ESCAP member countries (Australia, Bangladesh, Fiji, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, Papua New Guinea, Philippines, Republic of Korea and Thailand). Representatives of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and of the Office of the United Nations Disaster Relief Co-ordinatory (UNDRO) were also present.

8. Chairmen for lecture sessions and rapporteurs were nominated from among the participants for each of the lecture sessions, the group work, the local visits and the study tour.

IV. OPENING OF THE SEMINAR

9. Opening the Seminar, Mr. Masatoshi Ohta, Director of the Economic Affairs Division, United Nations Bureau, Ministry of Foreign Affairs, welcomed the participants on behalf of the Government of Japan. He referred to the vulnerability of southeast Asia to natural disasters caused by weather conditions and said that it was for that reason that the Typhoon Committee was one of the most important ESCAP activities. The Seminar was a further step forward in the same direction and he was sure that Japan's long experience in coping with natural disasters would enable all participants to acquire useful information from the programme of work planned.

10. Mr. Yasuyuki Togano, Director, River Planning Division, River Bureau, Ministry of Construction, joined the previous speaker in welcoming the participants to the Seminar on behalf of the Government of Japan. He drew attention to the long battle that Japan had waged to control the floods produced by typhoons and heavy rains and hoped that the Seminar would assist other countries in im-

11. A message from Mr. J.B.P. Maramis, Executive Secretary of ESCAP, was read by Mr. P. Rogers, Economic Affairs Officer, Natural Resources Division, ESCAP. In his message, Mr. Maramis expressed his sincere thanks to the Government of Japan for making the Seminar possible by the support it had provided. He recalled the events that had led to the Seminar, stressing that its ultimate value would lie in what the participants did with the knowledge acquired after returning to their own countries. Damage figures graphically illustrated the need for new initiatives and endeavours to stem the constant rise in losses.

12. Short statements were also made by Mr. F.P. Alves, Chief of the Observing System Division, WWW Department, WMO and Mr. Enso V. Bighinatti, Under Secretary General, Relief Sector, LRCS. Both speakers expressed their thanks to the Government of Japan on behalf of their organizations and emphasized the importance of the Seminar as a means of improving protective measures in the participating countries.

V. LECTURES AND GROUP WORK

A. BACKGROUND TO THE WARNING SYSTEM

13. The following introductory lectures were presented:

- (a) Tropical cyclone and flood forecasting, and the preparation of warnings;
- (b) Examples of flood forecasting and warning in the ESCAP region;
- (c) Community preparedness and disaster prevention.

14. In the course of a general review of the impact of tropical cyclones, it was observed that the average annual cost of the damage caused mainly by excessive rainfall and flooding in the ESCAP region was already well over \$US 2,000 million. The death, destruction and damage caused by tropical cyclones were considered to be preventable to a large extent by (a) improving the environment and (b) achieving a high degree of pre-disaster preparedness capacity. The former included reinforcement of houses and buildings, adequate drainage works, and construction of dykes, dams and by-pass channels, while the latter covered an efficient surveillance, prediction and warning system that could at once detect the cause of a phenomenon, process the data, predict the impact and communicate the same to its clientele.

15. The need for an integrated interdisciplinary approach was recognized in order that the valuable data thus collected could be scientifically processed for use in objective planning and action by the various agencies involved in the prevention and preparedness task. The need for the introduction of statutory building code and land use legislation was emphasized. A forceful plea was made in favour of urgent measures by Governments towards the early enactment of comprehensive disaster legislation covering both the preventive and the preparedness aspects of all types of disaster. In that regard, the initiative taken jointly by UNDRO, LRCS, WMO and ESCAP in suggesting meanings for the terms "disaster prevention" and "disaster preparedness" ^{1/} was welcomed as an important step towards a clearer and more widely accepted understanding of those terms, and it was suggested that they should be made widely known.

B. LECTURE SESSION I - ECONOMIC ASPECTS OF TROPICAL CYCLONE AND FLOOD DAMAGE

16. The following lectures were presented:

(a) Storm surge prediction

An outline was given of past storm surges causing severe damage in large cities in Japan. The development of methods and techniques for storm surge prediction was explained. The current system for storm surge prediction was also described.

(b) Some historical aspects of flood control in Japan

The historical development of flood-control works in Japan was explained in relation to the evolution of land and water use. The significant features of flood-control measures to meet conflicting demands emerging from the rapid growth of the Japanese economy were also described.

(c) The agricultural loss compensations system

The system, which applied to such crops and commodities as rice, wheat, barley, silk, cotton, livestock and fruit trees damaged by natural disasters, was outlined. A joint reserve fund, which had been created from premiums contributed by the farmers and from government subsidies, was also described.

(d) Methods of damage assessment

The method of flood damage assessment currently used by the Ministry of Construction in Japan was described. A detailed explanation was given, with actual examples, of how potential damage could be estimated as the basis for planning flood-control schemes.

17. During the group work session, considerable interest was evinced in the system of agricultural loss compensation in force in Japan, and the possibility of introducing a similar system in other countries was discussed. There was wide agreement that, under current circumstances, it would be neither possible nor advisable to introduce a compulsory insurance scheme in all the participating countries. It was felt that that matter should be left to the choice of each country in accordance with its socio-economic and geopolitical circumstances. It was clearly recognized, however, that the availability of insurance against losses from natural disasters, whether underwritten by Governments or through commercial interests, was highly desirable.

18. Discussion of methods of assessing the cost of damage revealed the need for a more uniform approach. The efforts being made in that direction under the programme of the WMO/ESCAP Panel on Tropical Cyclones, with the assistance of UNDRO, were explained to the Seminar. Attention was also directed to the importance of reliable damage assessments as a means of demonstrating the need for the funding of prevention and preparedness measures. Although the desirability of also making assessments of indirect losses from tropical cyclones was recognized, the difficulties of making such assessments in a realistic fashion were felt to be considerable. Guidance on the assessment of indirect losses was accordingly considered necessary. None of the countries participating in the Seminar made estimates of potential damage as described in the lecture.

C. LECTURE SESSION II - DISASTER LEGISLATION AND CO-ORDINATION OF NATIONAL DISASTER PREVENTION ACTIVITIES

19. The following lectures were presented:

(a) The basic system of disaster prevention in Japan

The lecture covered the basic law, basic disaster prevention plans, creation of a central co-ordinating agency and the assignment of responsibilities to the central government authorities. Pre-disaster planning was carried out by the Disaster Prevention Council at central, regional provincial, town and village levels. When a disaster occurred, a general headquarters for major disaster relief and rehabilitation might be established at the same levels.

(b) Disaster relief

The disaster relief system in Japan was outlined. Under the Disaster Relief Law of 1947, when disaster occurred the Government immediately took the necessary relief measures with the co-operation of the prefectural governments, the Japan Red Cross Society and other voluntary organizations. Details were also given of the extent of assistance in kind, other measures and the period of relief.

(c) Legislation for land use controls, zoning and building codes

An explanation was given of the legislation enacted in Japan, such as the Housing Site Development Law (1962), the Landslide Prevention Law (1958) and the Building Standards Law (1975). The redevelopment plan for the Koto district of Tokyo was described as a typical example of disaster-prevention measures, especially against future earthquakes. (The Koto district was subsequently visited by the Seminar participants.)

(d) Disaster prevention, protection and control system of the Fire Defence Agency and local governments

The system employed by the Fire Defence Agency was described. At the local government level, an explanation was given of the roles and activities relating to disaster prevention, protection and control as applied in 47 prefectures and 3,290 municipalities. Details were given of the fire defence bodies at the municipal level.

(e) Co-ordination of disaster prevention activities for the Tokyo metropolitan area

The lecture outlined the disaster prevention and community preparedness plan for the Tokyo metropolitan area as an example of a disaster preparedness plan at the prefectural level.

20. During the group work following the lectures, the following conclusions were reached:

Basis of organization

(a) The Seminar felt that the basis for the development of an appropriate disaster countermeasures organization was as indicated in the Japanese Disaster Countermeasures Basic Law, namely:

- (i) That policy should be clearly established at national level;
- (ii) That, within that declaration of national policy, planning should be decentralized to regional and local levels in accordance with the need, but always co-ordinated within a framework of broad national planning;
- (iii) That executive action should be decentralized to the appropriate levels and agencies in accordance with the scale of the particular disaster, with support and, where necessary, co-ordination at central government level.

(b) The Seminar noted the desirability of organic legislation at the national level, such as the Japanese basic law and disaster relief law, and commended specific provisions within that legislation, such as the arrangement under the disaster relief law for mutual aid on a regional basis.

(c) It also noted the widespread provision in the area covered by the Seminar participants for the declaration of an appropriate state of emergency in the event of major disaster, with the advantages in terms of national organization and co-ordination which such a power offered. It was concluded, however, that that power should be retained at national level.

Planning

(d) The variations in the degree to which national legislation delegated the responsibility for the development of countermeasures plans to regional/provincial and local levels were noted. It was concluded that such variations arose from differences in national organization and needs, and were acceptable provided that positive planning co-ordination was ensured.

Co-ordination

(e) Quite marked variations were noted in national systems as regards both the specific responsibilities of government and voluntary/philanthropic agencies (e.g. National Red Cross) and the systems for co-ordinating the activities of such agencies in time of disaster. Again, it was concluded that those differences resulted from clear differences in national historical development, organization and needs. However, it was recognized that co-ordination systems required a formal basis, either in legislation or in firm administrative arrangements, and must be based upon a clear understanding and definition of the roles and responsibilities of all participating agencies.

Land-use legislation

(f) While recognizing the problems inherent in effecting land-use legislation for disaster prevention purposes, the Seminar concluded that there was a need for all Governments to introduce and enforce such legislation in the interests of reducing the human, social and economic losses caused by disasters. It noted the need to employ a suitable blend of incentives and penalties to ensure the effectiveness of such legislation, based on a careful analysis of the problems and capacities of each country concerned.

Relationship between prevention and preparedness

(g) The Seminar recognized the close relationship between disaster prevention and community preparedness in the sense that, in disaster-prone areas where prevention was rendered difficult or impossible through natural or socio-political causes, a correspondingly greater importance must be given to community preparedness. In other words, where potential disaster problems could not be avoided by preventive action, the impact of such problems should be lessened by appropriate preparedness planning and action.

/(h)

(h) It considered that cost-benefit analysis might indicate the relative emphasis which should be placed on preventive and preparedness activity, but stressed that such analysis must be based upon realistic estimates of the full direct and indirect cost of actual and possible disasters.

Training and education

(i) The Seminar emphasized the importance of training and education in community preparedness, and the need to test-exercise and revise community preparedness plans regularly.

(j) It was concluded that developing countries should be encouraged to develop effective programmes for training and education in disaster planning and management. Countries should seek the necessary assistance to develop such programmes.

Relief organization

(k) The similarity of the basic principles and patterns of relief organization in most of the countries was noted. Stress was placed upon the need to establish appropriate relief machinery by legislation, allocating well-defined roles to government organs at the various levels as well as to statutory organizations, such as the Red Cross and other voluntary agencies. Provision must be made for full co-ordination between those bodies.

D. LECTURE SESSION III - PRE-DISASTER PREPARATION AND PLANNING

21. The following lectures were presented:

(a) Hydrological aspects of flood disaster prevention

The development of flood-control works in Japan was reviewed with examples of important rivers. The design flood discharge, which was the technical criterion for flood-control schemes, had been considerably increased, reflecting the evolution of land use. Erosion-control works, as measures for the conservation and protection of watershed areas, were explained.

(b) History of flood control of the Kiso River

The historical progress of flood-control works in the Kiso River system was reviewed in the light of floods which had induced the evolution of protective measures. The background to the comprehensive river improvement method established in recent years was explained.

/(c)

(c) Protective measures, including flood control and flood fighting, community involvement, evacuation plans, test exercises and resettlement

A comprehensive explanation of protective measures against floods was given. The plan adopted by the municipality of Sakae, Chiba prefecture, for damage prevention, emergency rescue and rehabilitation was described as a typical example of a regional disaster-prevention programme in Japan.

(d) The evolution of Red Cross disaster relief in Japan

The evolution of Red Cross relief services was traced and its responsibilities for medical care, midwifery services and disposal of dead bodies outlined. An account was given of the facilities at the disposal of the Japanese Red Cross Society, including more than 100 medical institutions, nearly 200 blood centres, 1,650 relief teams, a voluntary flying corps and amateur radio operators.

22. The Seminar briefly examined some economic and related aspects of flood prevention/preparedness programmes. The major conclusions were:

(a) Plans for flood prevention and preparedness must obviously be developed within the framework of a Government's budgetary capability. In that context, it was recognized that, while post-disaster relief and rehabilitation tended to be dictated almost entirely by humanitarian considerations, longer-term prevention and preparedness measures were inevitably and substantially shaped by political, social and economic considerations. The Seminar noted that post-disaster rehabilitation in Japan included provision in rehabilitation works for an increase in the criteria for disaster prevention.

(b) There was a need for some form of national statutory body to sponsor disaster countermeasures research and to establish priorities for such measures on the basis of cost-benefit analysis which took into account both direct and indirect costs. That would make possible the development of national policies and plans within economic capabilities and the continued refinement of national disaster countermeasures criteria, which should be monitored by some appropriate central agency.

(c) It had to be recognized that an advanced state of disaster prevention demanded much in research, effort, time and finance and could not be attained quickly or easily - the Japanese experience amply demonstrated that - but much might be achieved through determined government and community planning and action. That must be based on a full awareness of the problems, and a preparedness to devote a proportion of the national effort to their solution, within

national priorities and criteria. That placed a corresponding importance on the need to maintain a high level of community preparedness in all disaster-prone areas, to assist in offsetting the human and economic costs of disasters. Even where the level of disaster prevention was high, the cost-benefit return from such community preparedness, in terms of the mitigation of loss and damage, was also high.

(d) The role of voluntary agencies in community preparedness and post-disaster relief appeared to vary greatly among the countries represented at the Seminar, but it was clear that all countries relied substantially on voluntary effort in those areas. The cost-benefit return from effective voluntary agency involvement was clearly high, and the Seminar noted with approval the evidence that an increasing number of countries stressed the need for popular participation in community preparedness. The Seminar concluded, however, that the effectiveness of such agencies depended substantially on careful organization (including the provision of small full-time cadres where appropriate), a clear definition of roles and responsibilities compatible with capability, sound training and regular agency and interagency exercising, all within comprehensive and co-ordinated community, regional and national disaster countermeasures planning.

(e) By and large, the response of the public to measures and schemes for disaster preparedness and prevention was favourable. It was felt that people were conditioned by experience and history to react favourably and without resistance to such measures. However, there were instances when evacuation was resisted, for understandable reasons of attachment to hearth and home. To cope with that situation, some countries empowered local authorities to use force, although it had seldom been used.

(f) It was difficult to explain the benefit of massive investment of resources in measures for disaster prevention which did not show immediate results. It was agreed that maximum use should be made of local help in as many projects as possible, at least whenever technically feasible. That would overcome resistance, reduce cost and give the people a sense of pride in the project.

(g) A systematic and continuous educational programme should be carried out with the following objectives:

- (i) To inform people how to react individually and collectively to a disaster;
- (ii) To inform people how to act independently before any government aid arrived;

- (iii) To make first aid, civil defence and disaster relief a part of the curriculum in schools. Once disaster prevention measures had been implemented, test exercises and training should be carried out at regular intervals to avoid people becoming complacent.

E. LECTURE SESSION IV - PUBLIC INFORMATION AND EDUCATION

23. The following lectures were presented:

- (a) Research into public response during disaster, with particular reference to heavy rainfall at Shizuoka and Shimizu on 7 July 1974

Public response during the flood had been surveyed by interviewing the victims, circulating questionnaires and collecting reports of private groups and public agencies. The results had revealed the need for improvement of the warning system, establishment of an autonomous disaster preparedness organization by the residents, and promotion of the construction of two-storeyed houses.

- (b) NHK and disaster prevention reporting - Present activities and future plans

Under the current law, NHK was legally bound to broadcast warnings of heavy rains, rainstorms, floods, storm surges and typhoons. It also had to provide information on earthquakes. NHK was developing new methods for providing up-to-date meteorological information to the public by using the data available from the ADESS and electronic computer centre of JMA.

- (c) School education for disaster prevention

The paper reviewed current courses of study related to "disaster education" given at elementary and secondary school levels. Emphasis was placed on relevant human factors, such as environment, way of dressing, behavioural patterns and state of mind.

24. The group work led the Seminar to the following conclusions:

- (a) Public response to warnings

It was agreed that:

- (i) There should be continuous training and education in what to do and where to go in the event of a disaster, and there should be no complacency on the part of the public;
- (ii) Warnings and education should be concentrated more in areas frequently visited by disasters than in those less vulnerable;
- (iii) Countries should consider establishing research programmes for future reference in the preparation of disaster plans;

- (iv) The after-effects of disaster, such as food shortages, water shortages and communication problems, should be given special consideration.

- (b) Radio and television information for the public

It was agreed that:

- (i) The objective presentation of the situation in as much detail as possible was a prerequisite for community preparedness and disaster prevention;
- (ii) Credibility of the information broadcast was a very important factor. It should serve to dispel wild rumours and prevent undue panic among the disaster-stricken population;
- (iii) The information broadcast should report the areas damaged, and also the areas that were safe, and give information on escape routes. It should give details of rescue and relief measures being taken, availability of shelter, and the precautions to be taken against outbreaks of epidemics, and should help to restore public morale;
- (iv) During emergency periods, normal broadcasting might be interrupted to make room for special broadcasts about the disaster situation at regular intervals;
- (v) Arrangements should be made to ensure that the broadcasts reached the population for which they were intended.

- (c) Public education

It was agreed that it was desirable to include an element on "disaster education" in school curricula, especially in countries with a high level of disaster threat. It should include instruction in first aid and exercises in appropriate disaster behaviour, such as evacuation of schools. It was also considered that professional agencies (e.g. police safety and fire authorities) and voluntary agencies (e.g. the Red Cross) should be invited to contribute to such "disaster education" programmes.

F. LECTURE SESSION V -- RELIEF AND REHABILITATION

25. The following lectures were presented:

(a) Restoration of public works

The legal and financial provisions for the restoration of public facilities, public housing schemes, and private houses damaged by disasters were explained.

(b) Medical relief resources in emergency conditions

Under the current laws, the Japan Red Cross Society provided medical relief services at times of disaster. Prefectural chapters, hospitals, blood centres and medical clinics of JRCS could be mobilized as medical relief centres and, if necessary, emergency relief teams were organized and dispatched to the scene of the disaster.

(c) Organization of international relief for natural disasters

When disaster struck, outside assistance was often provided by the international community. It might be provided through Governments, the United Nations Disaster Relief Co-ordinator (UNDRO), the League of Red Cross Societies (LRCS) and international voluntary agencies. The organization and co-ordination of those sources of relief were explained.

26. The group work resulted in the formulation of a number of conclusions. On the subject of relief, the Seminar first agreed on a definition of relief, and on its scope:

(a) Relief meant providing for the immediate needs of disaster victims;

(b) The scope of relief included the following types of aid:

- (i) Rescue;
- (ii) First aid;
- (iii) Temporary shelter;
- (iv) Food and drink;
- (v) Clothing;
- (vi) Comfort and counselling.

27. It was agreed that the basic essentials of an effective relief system were as follows:

- (a) Relief must be given as soon as possible;
- (b) Relief must be sufficient to meet the need - recognizing that

28. The basic principles of the organization of relief were examined and it was agreed that the following points were particularly important:

(a) Co-ordination of relief measures must be the responsibility of the Government of the country concerned;

(b) Disaster relief plans were essential; they must be prepared in advance and must ensure that:

- (i) The duties and responsibilities of those participating in relief work were clearly laid down;
- (ii) The people concerned and the public understood how the plan worked;
- (iii) The plans made provision for the essential resources, not only of relief handouts but also of personnel, transport, equipment and temporary shelter;

(c) Decisions on relief measures should be taken as near to the scene of the disaster as possible (maximum delegation of authority to those closest to the problem);

(d) Plans should be reviewed regularly and also after a particular disaster.

29. Country experience in relief work was also reviewed. It was found that all countries represented confirmed the principles already stated, but that, in practice, their modes of organizing and administering relief varied according to their local circumstances. Attention was focused on two main areas of difference:

- (a) Responsibility for resources for relief;
- (b) Legislation supporting relief measures.

30. On resources, it was noted that some countries depended much more than others upon support of voluntary associations in the implementation of their relief plans. The extremely important role played by the Red Cross in many of the countries represented was stressed.

31. On legislation, it was found that some countries had very elaborate laws covering disaster relief measures, while others managed without them.

32. It was concluded that:

- (a) The exchange of experience made possible by the Seminar was useful; and
- (b) Each delegate had found some idea or ideas that he considered might be of value in his own country to improve the effectiveness of disaster relief

33. For purposes of discussion, the following definition of rehabilitation was accepted by the Seminar:

Those measures required to assist in the rapid return of the community to normal life, including:

(a) Measures to assist the individual, such as provision for the restoration of housing and livelihood and for coping with longer-term post-disaster personal problems; and

(b) Measures to assist the community as a whole, such as the restoration of public and community services and utilities.

Responsibilities for rehabilitation action

34. The Seminar concluded that Governments must accept the over-all national responsibility for rehabilitation in all its aspects, the particular level at which responsibility for specific rehabilitation action should reside being determined by each Government in terms of the organizational structure, institutions and capabilities of the particular country.

35. The national institutions which might be able to assist in rehabilitation action, and which should thus be involved in the national rehabilitation plan, included voluntary agencies and private sector organizations. Rehabilitation assistance available from international sources following a major disaster should be considered as a supplement for application within the basic national plan.

36. In regard to legislation, the group noted that national legislation to establish the administrative framework within which post-disaster rehabilitation action should be taken might be desirable in terms of the over-all responsibilities of Governments. Such legislation would serve to promote rapid rehabilitation action, ensure appropriate co-ordination and avoid duplication of effort. It would also serve to establish an effective in-country system through which international aid, as appropriate, could be channelled to best effect. In the absence of a need for legislation, the same end should be sought by appropriate administrative arrangement.

Rehabilitation to avoid future disasters

37. While the Seminar acknowledged the problems which might face Governments in establishing appropriate policies, it concluded that, in taking rehabilitation measures, Governments should be cognizant of the need to avoid creating circumstances which might be conducive to future disasters.

Co-ordination of effort

38. The Seminar considered the evident problems facing government at all levels in the co-ordination of the large number of agencies involved in rehabilitation, and concluded that co-ordination of those agencies should take place at the highest possible national level.

VI. COUNTRY PAPERS

39. One day of the Seminar programme was devoted to the presentation of country papers by participants. In general, these papers reached a high standard and were found to be of considerable interest to all the participants. They will be reproduced in the Proceedings of the Seminar to be published in due course. The titles are given in annex II.

VII. STUDY TOUR AND LOCAL VISITS

A. STUDY TOUR

40. A study tour in the Nagoya and Osaka areas took place from 18 to 20 June. Visits to various facilities intended for the mitigation of flood damage were organized by the regional bureaux of the Ministry of Construction in co-operation with the Nagoya City Office and the Osaka Prefectural Government.

1. Nagoya area

41. A brief explanation of the area called the Nobi Plain located in the delta of the Kiso Sansen (three rivers) was given at the Chubu Regional Construction Bureau. The importance of the Nobi Plain, which is characterized by its productivity and its vulnerability to floods, was stressed. The consequences of the Isewan typhoon in 1959, with a death toll of about 5,000 persons and a material loss of hundreds of billion yen, were highlighted. The briefing was followed by visits to the following strategic facilities:

(a) Kiso Sansen Control System

The system consists of a number of automatic stations which transmit observed hydrological data and a data-processing facility permitting a real-time representation of the situation of the rivers with the help of a computer. The system is particularly intended for the optimum operation of reservoirs for the purposes of water-quality and flood control. Flood forecasting and warning are also undertaken by the Bureau with the help of the control system.

(b) Area with restricted land-use

Land-use control in Nagoya City was outlined prior to the visit. Certain parts of the city are designated by a city ordinance as residential, commercial, light industrial and heavy industrial zones. A visit was made to the low-lying area where the construction of new houses on ground less than two metres above the mean ebb-tide level is prohibited by the ordinance.

(c) Nikko River Pumping Station

The Nikko River with its catchment area extends into the low-lying area of Nagoya City which is protected from storm surge by closing the tidal gate located at the river mouth. A pumping station to facilitate drainage of the river while the tidal gate is closed is being constructed beside the gate.

(d) Matsunaka Land Subsidence Gauging Station

Nobi Plain, like other deltaic areas in Japan, suffers from land subsidence caused mainly by the exploitation of ground water for agriculture and other purposes, resulting in increased vulnerability to flood and storm surge. The station measures contraction of the ground up to the depths of 50 m and 150 m, together with the ground-water head.

(e) Chisui Shrine

Located on the Kiso-Ibi Separation Dyke, which is the most strategic facility for flood control in the Kiso River system, the shrine commemorates those warriors who sacrificed themselves in the separation work carried out with great difficulty some 150 years ago.

2. Osaka area

42. Osaka, situated in the delta of the Yodo River, has been a centre of commerce and industry in Japan since last century. The area is protected from floods and storm surges by means of extensive engineering works, of which the following were visited:

(a) Aji River Storm Surge Control Gate

The gate is one of the five storm surge control gates located at the mouths of small rivers which drain the low-lying area of Osaka prefecture. The gate is in the shape of an arch so as to facilitate the passage of ships when it is open and also to withstand better the pressure of water. The gate is only closed if there is an imminent danger of storm surge.

(b) Kema Pumping Station

One of the largest pumping stations in the world, with an average capacity of 330 m³/sec, is being constructed by the Osaka Prefectural Government. The station is intended to improve drainage of the area enclosed by the left dyke of the Yodo River and protected by the storm surge control gates. The participants were given a brief account of the history of flood control in the Yodo area leading up to this project.

(c) Yodo River Dams Control Office

The Yodo River has three major tributaries, each of which has quite different characteristics. The river system includes the largest lake in Japan and a number of multipurpose reservoirs, making the river regime extremely complicated. The control office is intended for an on-line collection and processing of the data obtained from 102 hydrological stations for the purposes of flood forecasting and effective operation of dams and weirs in the river basin.

B. LOCAL VISITS

1. The Red Cross Chapter of Kanagawa Prefecture

43. During the visit, the Chapter organized exercises in disaster relief, it being assumed that a destructive earthquake had occurred. The exercises began with first aid being given to a number of injured persons who were then removed to hospital. A simulated mountain rescue was next demonstrated, using the side of the Chapter building. An unfortunate mishap occurred when one of the rescuers slipped and fell on to a ledge about 10 feet above the ground. The exercise thus became a genuine rescue to bring the injured person to the ground and transport him to hospital. Fortunately, he was only slightly injured.

44. Other demonstrations included the use of an aerial ropeway, a pneumatic splint and an inflatable rubber stretcher. Relief stores were inspected, and the making of relief clothing by volunteers was observed.

2. Disaster preparedness projects in Koto District

45. Koto District, located in an area sandwiched between two big rivers, is characterized by its dense population, ground level lower than surrounding waters, and soft ground formation. It is thus particularly vulnerable to such disasters as flood, storm surge, earthquake and fire. The situation has been worsened by land subsidence. Consequently, the district is one of the most vulnerable in Japan.

46. The visit began at Koto Ward Office where the participants were given an outline of the district and the project. The organization of 186 citizens' anti-disaster co-operation corps, which can assist in evacuating the population to 98 places of refuge accommodating 325,395 persons, was explained.

47. Briefing at the ward office was followed by visits to the following places:

- (a) Onagi River Pumping Station, the largest of several pumping stations draining the area concerned;
- (b) Roku-No Hashi (sixth bridge), which clearly indicates the progress of land subsidence;
- (c) One of the five storehouses strategically located close to places of refuge to provide food, blankets, clothes, etc. to disaster victims.

3. NHK Broadcasting Centre

48. Japan Broadcasting Corporation (NHK), one of the world's largest non-commercial broadcasting systems, has its studios in the newly constructed broadcasting centre. Two television studios were visited.

4. Japan Meteorological Agency (JMA)

49. An outline of the extensive meteorological services undertaken by JMA was given to the participants. They were then shown the Computer Centre, the Automated Data Editing and Switching System (ADESS) and the Forecasting Division.

5. Flood-fighting exercise

50. A flood-fighting exercise was held on the dyke of the Tone River by the Tone and Kokai Rivers Flood Protection Association. The exercise started on the hypothesis that the water stage in the Tone River would be expected to exceed the design high-water level. Various types of emergency protective works were demonstrated by a number of flood-fighting groups. It was noteworthy that the exercises were carried out entirely by manpower with local materials, such as bamboo stakes, logs and sandbags. Equipment for use in the preparation of emergency water supplies and food was also seen.

VIII. EVALUATION AND CONCLUSIONS

51. The analysis of the evaluation of the Seminar by the participants clearly indicated that they had all benefited from the experience, in one way or another, despite certain inherent difficulties in the organization and conduct of a Seminar of this nature. The efforts of the organizers, Programme Director, resource persons and others involved in the planning and conduct of the Seminar also received unanimous appreciative mention. The consensus which emerged was that the general purpose of the Seminar had been duly achieved.

52. The detailed analysis of the responses to each of the questions raised in the Evaluation Sheet may be summarized as follows:

Question 1 To what extent have your personal objectives in attending the Seminar been fulfilled?

All participants replied that their personal objectives in attending the Seminar had been fulfilled.

Question 2 Did you have sufficient opportunity to interact with other participants?

All participants felt that they had had sufficient opportunity to interact with each other.

Question 3 Specifically, what new ideas and techniques did you learn at the Seminar that can be of help to your work?

Participants were in general extremely impressed with the well developed and planned prevention programme in Japan. However, some expressed the view that, in their countries, for multiple reasons, large programmes of preventive measures would be very difficult to implement.

The legislation in Japan on disaster prevention and preparedness measures also impressed participants favourably, and some felt that there was room for improvement in that regard in their own countries. For a number of participants, the knowledge acquired in the field of community preparedness, in particular through the activities of the Japan Red Cross Society, would be of tremendous value in their future activities back home.

Question 4 Which lecture sessions were most valuable to you?

The lectures were generally found valuable. However, special mention was made of the following:

- (a) The introductory lectures on the background to the warning system;
- (b) Disaster legislation and co-ordination of national disaster prevention activities;
- (c) Pre-disaster planning and preparedness;
- (d) Public information and education.

Some participants, however, indicated their preference for the lectures dealing particularly with the aspects of community preparedness and relief measures.

Question 5 Please comment on the group work discussion.

The following table indicates the opinions expressed by the participants:

	Poor	Fair	Good	Excellent
Constitution of groups	1	6	8	2
Topics discussed	-	4	11	3
Length of time	5	8	4	-
Participation of group members	-	4	8	5
Physical facilities	-	3	10	4
Service of resource person	1	1	10	5

The participants generally remarked on the time allotted for group work and the irregular grouping of lectures which consumed most of the time allowed. Some felt that a half day could have been devoted to lectures, with two to three hours for group discussions and time also provided for digesting the lectures.

Question 6 In your opinion, the Seminar could have been improved by:

- (a) including the following topics or issues in the programme
- (b) eliminating the following topics or issues from the programme
- (c) other ideas or suggestions.

A few additional subjects were suggested, e.g. "The financial aspects of disaster prevention measures".

No suggestions were made for elimination of subjects. However, many participants remarked that an elimination of repetitive information in some

lectures would have been desirable. Another general remark was that lectures could have been short, highlighting the important points of the paper presented, and that it would have been preferable to programme the lectures with the relevant field visit instead of grouping the lectures on the one hand and the field visits on the other.

Question 7 Which of the local visits did you consider to be most valuable to you? Why?

The views expressed on the specific value of the local visits were based on their usefulness and relevance to the conditions prevailing back home. However, the general view was that all were valuable and extremely interesting.

Question 8 For the Study Tour, we would like to have your reaction to the following.

The table below shows the views of the participants:

	Poor	Fair	Good	Excellent
Reception of the participants	-	-	8	10
Accommodation arrangements	-	2	9	7
Daily transport	-	-	5	13
Display of information	-	2	10	6
Explanation provided at sites	-	2	9	6
Other services	-	1	12	5

The consensus was that the Study Tour was useful in understanding the lectures. Some expressed the wish to have had more time for discussions on the spot.

Question 9 Do you consider that the level of the Seminar came up to your expectations?

The following table illustrates the opinion of the participants:

Higher than expected	6
Just right	11
Lower than expected	1

Question 10 Do you feel that your participation in this Seminar has been of benefit to you professionally?

The table below gives the opinions expressed:

To a great extent	9
To a sufficient extent	9
To a small extent	1

Question 11 What are your ideas or suggestions for following up the activities of the Seminar?

All participants agreed that some sort of follow-up was required. Their suggestions may be summarized as follows:

- (a) The report of the Seminar should be formally submitted to their countries;
- (b) The participants should report to ESCAP through their Governments on the achievements made during the next 12 months;
- (c) Similar seminars should be organized at regular intervals of three to five years;
- (d) Recommendations should be made by the participants to their Governments for the improvement of their countries' disaster prevention and community preparedness measures on the basis of the conclusions reached at the Seminar.

IX. CLOSING OF THE SEMINAR

53. The Seminar was closed on the afternoon of 29 June 1976. At the final session, the participants expressed their unanimous wish that their thanks to the Government of Japan, ESCAP, and all who had been associated with the Seminar be recorded in the report.

Annex I

LIST OF PARTICIPANTS

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LECTURERS

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A. Kawazoe Assistant Director, Insurance Management Division, Economic Affairs Bureau, Ministry of Agriculture and Forestry, Japan

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M. Kobayashi Senior Specialist, Social Welfare Division, Social Affairs Bureau, Ministry of Health and Welfare, Japan

M. Konoye Director, Second Division, Foreign Affairs Department, Japan Red Cross Society

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- . Takeuchi Senior Specialist, Planning Department, Chubu Regional Construction Bureau, Ministry of Construction, Japan
- . Takuma Chief, Education Technology Section, National Institute for Special Education, Ministry of Education, Japan
- . Yamaguchi Chief, Urban River Section, Public Works Research Institute, Ministry of Construction, Japan
- . Yoshikai News Editor, Japan Broadcasting Corporation

/Annex II

Annex II

LIST OF DOCUMENTS

A. LECTURE TEXTS

Summary of lectures, ESCAP

Tropical cyclone and flood forecasting and the preparation of warnings, by Mr. A. Hamamori, TCS

Examples of flood forecasting and warning in the ESCAP region, by Dr. T. Kinoshita, National Disaster Prevention Research Center, Science and Technology Agency

Community preparedness and disaster prevention, by Mr. Enso V. Bighinatti, League of Red Cross Societies

Storm surge prediction with emphasis on storm surges induced by typhoons along the Japanese coast, by Dr. M. Miyazaki, Japan Meteorological Agency

Some historical aspects of flood control in Japan, by Dr. Y. Takahashi, Tokyo University

Insurance schemes - Outline of the agricultural loss compensation system, by Mr. A. Kawazoe, Ministry of Agriculture and Forestry

Methods of damage assessment, by Mr. H. Ōhi, River Bureau, Ministry of Construction

Basic system of disaster prevention in Japan, by Mr. H. Kamikawa, National Land Agency

Disaster relief, by Mr. M. Kobayashi, Social Welfares Bureau, Ministry of Health and Welfare

Legislation for land use controls, zoning and building codes, by Mr. H. Takemoto, Planning Bureau, Ministry of Construction

Disaster prevention, protection and control system of the Fire Defense Agency and local governments, by Mr. Z. Kaneko, Fire Defense Agency, Ministry of Home Affairs

Co-ordination of disaster prevention activities for the Tokyo metropolitan area, by Mr. T. Kishida, Tokyo Metropolitan Government

Hydrological aspects of flood disaster prevention (Part I), by Mr. H. Takamura, Science and Technology Agency

Hydrological aspects of flood disaster prevention (Part II) by Mr. A. Hashimoto, Science and Technology Agency

History of flood control of the Kiso River, by Mr. Y. Takeuchi, Chubu Regional Bureau, Ministry of Construction

Evolution of Red Cross disaster relief in Japan, by Mr. M. Konoye, Japan Red Cross Society

Protective measures, including flood control, flood fighting, community involvement, evacuation plans, test exercises and resettlement, by Mr. K. Sasaki, River Bureau, Ministry of Construction

Regional disaster prevention programme in Japan, Sakae Town's area disaster prevention plan, Ministry of Construction

Research into public response during disaster, with particular reference to heavy rainfall at Shizuoka and Shimizu on 7 July 1974, by Mr. T. Yamaguchi, Public Works Research Institute, Ministry of Construction

NHK and disaster prevention reporting - Present activities and future plans, Mr. M. Yoshikai, TV News Editor, NHK

School education for disaster prevention, by Mr. S. Takuma, Director, National Research Institute for Special Education, Ministry of Education

Restoration of public works, by Mr. N. Takemoto, Planning Bureau, Ministry of Construction

Medical relief resources in emergency conditions, by Dr. G. Nozue and Mr. Y. Takahashi, Japan Red Cross Medical Center

Organization of international relief for natural disasters, by Mr. E.V. Bighinatti, League of Red Cross Societies

B. COUNTRY PAPERS

Australia

* Australian approach to counter disaster preparedness, by Mr. R.T. Jones, National Emergency Services College

Role of the Natural Disasters Organization, by Major-General A.B. Stretton, Natural Disasters Organization

Cyclones-Local planning guide, by Natural Disasters Organization

Bangladesh

* Disaster preparedness in Bangladesh, by Mr. R. Ahmad, Ministry of Relief and Rehabilitation

Suggestions for short term disaster plan for flood, by Mr. R. Ahmad, Ministry of Relief and Rehabilitation

France

Disaster Planning in France - The "ORSEC" Plan, by Mr. Grassin, Chef du Service des Plans de Secours à la Direction de Sécurité Civile du

Fiji

* Pre-disaster planning and preparation organization in Fiji, by Lt.Col. M.V. Buadromo, Permanent Secretary for Home Affairs

Hong Kong

* Dealing with homeless victims of disasters in Hong Kong, by Mr. John Walden, Kowloon City

* Organization and operation of the protective system against natural disasters in Hong Kong, by Mr. G. Sapstead, Highways Office, Public Works Department

India

* Flood forecasts and warning systems in India, by Mr. S. Padma Kumar, Revenue Department, Government of Kerala

* Disaster preparedness, rescue, relief and rehabilitation in the State of Gujarat, India, by Mr. K.N. Zutshi, Revenue Secretary, Government of Gujarat

Disaster legislation and co-ordination of national disaster prevention activities, by Mr. Ajit Bhowmik, Indian Red Cross Society

Indonesia

Disaster preparedness programme, by the Indonesian Red Cross

* Indonesian Red Cross' disaster preparedness programme 1975-1979

* Community preparedness and disaster prevention in Indonesia, by Directorate of Rivers, Ministry of Public Works and Electric Power

Community preparedness and disaster prevention in Indonesia, by Ministry of Social Affairs

Japan

Disaster countermeasures basic law and related laws and ordinance, by National Land Agency, June 1976

Rivers in Japan, by River Bureau, Ministry of Construction, 1975

Organization and function of Ministry of Construction and Rivers in Japan, by River Bureau, Ministry of Construction, June 1972

Malaysia

* Malaysia Red Crescent Society Relief-resources, by Mr. A.R. Hj. Abudullah

Pakistan

* Pre-disaster planning in Pakistan, by Mr. N. Asif, Deputy Commissioner, Lyallpur

Papua New Guinea

- * Disaster legislation and co-ordination of national disaster prevention activities in the Independent State of Papua New Guinea, by Mr. Tom Hila, Deputy-Director of Civil Defence

Philippines

- * Pre-disaster preparation and planning, by Mr. V. Majarocon, Philippine National Red Cross

Hand book for disaster preparedness and relief, by the Philippine National Red Cross

Republic of Korea

Disaster prevention activity in Korea, by Disaster Prevention Division, Ministry of Construction

Thailand

- * Relief and rehabilitation, by Dr. Tawan S. Bunnag, the Thai Red Cross Society

Mauritius

Lessons from a direct hit

* Presented at the Seminar.

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FOR PARTICIPANTS ONLY

WRD/TC.9/10
28 September 1976

ORIGINAL : ENGLISH

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC
AND
WORLD METEOROLOGICAL ORGANIZATION

Typhoon Committee
Ninth session
23-29 November 1976
Manila

REPORT ON INFORMAL DISCUSSIONS WITH NATIONAL
AUTHORITIES ON COMMUNITY PREPAREDNESS AND DISASTER PREVENTION*

(Item 4(c) of the provisional agenda)

* Available only in English.

Report on informal discussions with the Thai authorities
as a follow-up to the Joint LRCS/WMO/ESCAP Mission
on Community Preparedness and Disaster Prevention
(Bangkok, 4 May 1976)

Introduction

1. The Joint Mission to Thailand took place in March 1973 and a short follow-up visit for informal discussions was made in December of the same year. At that time, there were encouraging indications that action was being taken by Thailand on the recommendations of the Joint Mission, notably in establishing the National Committee for Disaster Preparedness (NCDP) which would be the foundation of the future programme in community preparedness and disaster prevention. Changes of Government in Thailand resulted in NCDP being dissolved in 1975 and its replacement by a committee with much broader responsibilities. In view of these changes, the Typhoon Committee, at its eighth session (November 1975), included in its programme of work for 1976 further informal discussions on CP/DP matters with the Thai authorities.

2. In consultation with Thailand, the discussions were arranged for 4 May 1976. They were held in the Conference Room of the Thai Red Cross Society and were attended by 15 persons, representing five government departments, the King's Foundation, the Thai Red Cross Society and the three organizations forming the Joint Mission. A list of those present is appended to this report. The chair was taken by Captain Prasert Soontarotok, Deputy Director-General, Meteorological Department.

Discussions

3. An opening statement was made on behalf of the Joint Mission by Dr. Kingsley Seevaratnam (LRCS). It was followed by a general discussion during which the representatives of each of the Thai bodies present were invited to provide information on their CP/DP activities and the problems they encountered. One of the main features of this discussion was the description of the functions of the enlarged committee replacing NCDP under the "National Civil Emergency Plan (NCEP)", which were stated to consist of air defence, community preparedness, sabotage and population evacuation. Community preparedness was being handled by a sub-committee on civil defence preparedness.

4. During the discussion it was emphasized that, although the new NCEP Committee had a very wide area of interest, the responsibilities of departments, sub-departments, etc. in CP/DP were unchanged. It was important therefore that progress in CP/DP be maintained and, when practicable, accelerated.

5. Although the Joint Mission's principal recommendation for the establishment of NCDP had not been fulfilled, a number of speakers were emphatic in stating that they had nonetheless found the original Joint Mission of considerable value. That there had been greatly increased co-operation since the mission between many of the bodies in carrying out preparedness and relief activities was stressed time and again. The need to continue following up the recommendations was also emphasized.

Conclusions

6. The meeting noted that an over-all CP/DP plan would be to a great extent a simple integration of numerous small plans drawn up by departments and other agencies either separately or in joint efforts of two or more such departments and agencies. Consideration might therefore be given to the possibility of forming sub-committees and working groups for specific aspects of CP/DP. ESCAP, LRCS and WMO would be prepared to assist and advise in all appropriate CP/DP matters. It was agreed that liaison with these and other international organizations could be arranged with the Meteorological Department through the Local Administration Department.

7. Reference was also made to the very useful work that the Typhoon Committee was pursuing in community preparedness and disaster prevention, which Thailand would follow closely. Such projects as the Guidelines and the Tokyo Seminar were cited as good examples.

/List of

List of participants

Captain Prasert Soontarotok	Deputy Director-General, Meteorological Department
Mr. Tawatchai Brikshavana	Meteorological Department
Mr. Patipat Patrivatsiri	Meteorological Department
Mr. Damras Chongdarakul	Meteorological Department
Mr. Sudchitr Corvanich	Chief, Local Administration Department
Mr. Sataporn Vareesri	Local Administration Department
Mr. Manas Srisomboon	Chief, Planning and Co-ordinating Section, Division of Disaster Relief, Department of Public Welfare
Mr. Damrong Jaraswathana	Director, Hydrology Division, Royal Irrigation Department
Mr. Sanit Vesa-rajana	King's Foundation
M.L. Charé Sudasna	King's Foundation
Dr. Tawan S. Bunnag	Director, Relief Division, Thai Red Cross Society
Mr. Mitsuo Kawamura	ESCAP
Mr. P.J. Meade	WMO
Dr. Kingsley J. Seevaratnam	LRCS
Mr. Peter Rogers	ESCAP

/Report

Report on informal discussions with the authorities of the
Republic of Korea as a follow-up to the Joint LRCS/WMO/ESCAP
Mission on Community Preparedness and Disaster Prevention
(Seoul, 5 July 1976)

Introduction

1. The Joint Mission to the Republic of Korea took place in March 1973 and a short follow-up visit for informal discussions took place on 2 June 1975. At its eighth session, the Typhoon Committee included in its programme of work for 1976 further informal discussions with the authorities of the Republic of Korea on CP/DP matters.

2. In consultation with the Republic of Korea, arrangements were made for a meeting of those concerned and the members of the Joint Mission. The meeting was held in the office of the Director-General of the Central Meteorological Office on 5 July 1976. It was attended by 13 persons, representing three government departments, the Republic of Korea National Red Cross and the three organizations forming the Joint Mission. A full list of the participants is attached to this report. The chair was taken by Dr. In Ki Yang, Director-General of CMO.

Discussions

3. Following the opening remarks of Dr. Yang, a statement was made on behalf of the Joint Mission by Mr. Peter Rogers (ESCAP). The background to the Typhoon Committee's activities in community preparedness and disaster prevention was explained and the purposes of the follow-up visit outlined.

4. The Mission learned that a major development had taken place since its previous visit in the setting up of a new Civil Defence Headquarters in October 1975. This new body had been found necessary because the Republic of Korea was exposed to many potential disasters other than those covered by the Storm and Flood Control Law. The Civil Defence HQ had been given responsibility for a unified national disasters policy at the central level, but the various ministries concerned retained their individual responsibilities for specific disaster situations. The Mission was informed that the Government had no intention of changing that situation. The Civil Defence HQ, which is divided into a Civil Defence Bureau and a Fire Fighting Bureau, had been charged with the preparation of a new national civil defence plan which was not complete at the time of the Joint Mission's visit. Although that plan would provide for the over-all control and co-ordination of national disaster activities, it was not yet

the Storm and Flood Control Law which would be modified only to the extent necessary to bring it into conformity with the new plan.

5. The representative of the Ministry of Construction gave a short account of his attendance at the Tokyo Seminar on Community Preparedness and Disaster Prevention for the benefit of the other participants. He also reviewed some of the activities of the Disaster Prevention Division (MOC) in relation to CP/DP questions, and particularly those relating to the Command Post Exercises (CPX) instituted in 1975. These exercises are conducted over a period of three days and two nights during May (Disaster Prevention Month) to test the state of readiness to cope with disaster. They had again been very successful in 1976.
6. In response to inquiries on public information and education activities in the Republic of Korea, the Joint Mission was informed that full use is made of the mass media. Radio and TV broadcasts on disaster prevention are made from time to time to educate the public, and occasional articles are published in the newspapers. The Mission was supplied with a copy of a booklet containing weather advice for fishermen (in Korean).
7. Similarly, there is no problem regarding the distribution of warnings in the Republic of Korea. When necessary, they are broadcast hourly, and, for civil defence purposes and through the New Community Movement, every village is equipped to receive the warnings.
8. During the discussions, reference was made to the visits that the Joint Mission had made to the new Civil Defence HQ and to the Disaster Prevention Control Room at MOC. In the first of these visits, a courtesy call had been paid on the Director of the Civil Defence Bureau where explanations of the role of the new organ had been given to the Mission team. The Mission had been impressed by the facilities available in the Control Room at MOC. It was noted that the meteorologist from CMO on duty there during emergency periods obtained up-to-date weather information by telephone or by messenger bringing over charts etc. from the relatively nearby CMO. The Mission felt that such an arrangement was not entirely satisfactory and that it could be greatly improved by the installation on a facsimile receiver in the MOC Control Room. It therefore strongly supported the recommendation to that effect previously made by the telecommunication/electronics expert of the Typhoon Committee secretariat.

9. The Korean National Red Cross representative confirmed that the 1973 Joint Mission's recommendation for a "hot-line" between KNRC and MOC had been implemented. It was suggested, however, that more contact between government agencies and KNRC at the working level was desirable.

Conclusions

10. As part of the Joint Mission's visit, the team was taken to the Han River Flood Control Office where the computerized flood-forecasting system was explained.
11. As on its previous visits to the Republic of Korea, the Joint Mission was left in no doubt of the very active steps taken by the authorities in community preparedness and disaster prevention. There are constant efforts at various levels to improve the system, and the people are closely involved in preparedness activities. The Joint Mission suggests that the authorities may wish to consider the two recommendations contained in paragraphs 8 and 9 above.

/List

List of participants

Mr. Yoon, Seok Kil	Chief, Disaster Prevention Division, Water Resources Bureau
Mr. Lee, Yun Sik	Sub-Section Chief, Disaster Prevention Division, Water Resources Bureau
Mr. Lee, Bong Hak	Chief, Planning Division, Civil Defence HQ
Mr. Kim, Koo Yeong	Sub-Section Chief, Planning Division, Civil Defence HQ
Dr. Yang, In Ki	Director-General, General Meteorological Office
Mr. Park, Yong Dae	Chief, Observational Division, Meteorological Services Department
Mr. Seang, Hak Joong	Chief, Applied Meteorological Research Division, Research and Development Department
Mr. Kim, Moon Il	Sub-Section Chief, Applied Meteorological Division, Research and Development Department
Mr. Ryang, In Ki	Chief, Relief Division, Republic of Korea National Red Cross
Mr. Yoon, Seok In	Chief, International Division, Republic of Korea National Red Cross
Mr. F. Pimenta Alves	WMO
Mr. Peter Rogers	ESCAP
Dr. Kingsley J. Seevaratnam	LRCS

/Report on

Report on informal discussions with the Hong Kong authorities as a follow-up to the Joint LRCS/WMO/ESCAP Mission on Community Preparedness and Disaster Prevention (Hong Kong, 7 July 1976)

Introduction

1. The Joint Mission to Hong Kong took place in March 1973. At its eighth session, the Typhoon Committee included in its programme of work for 1976 informal discussions with the Hong Kong authorities of CP/DP matters.
2. In consultation with Hong Kong, arrangements were made for a meeting of those concerned and the members of the Joint Mission. The meeting was held at the Colonial Secretariat on 7 July 1976. It was attended by 26 persons, representing 13 government departments, the Hong Kong Red Cross, the Salvation Army and the three organizations forming the Joint Mission. A full list of the participants is attached to this report. The chair was taken by Mr. H.M.A. Bristow, Principal Assistant Secretary.

Discussions

3. In welcoming the Joint Mission to Hong Kong, Mr. Bristow said that there had been no serious disaster in the Crown Colony since the 1973 Mission. There had been problems in 1975 with the influx of refugees from Viet-Nam and those problems had extended the resources of the welfare and relief agencies as in a natural disaster. Consideration had been given to the need for a more formal structuring of the system in Hong Kong and there had recently been a proposal to set up a policy group. That group would hold regular meetings and try to improve contingency plans. It would advise the Government on policy but would have no operational or co-ordination functions. No decision had yet been made to set up the group, but the idea appeared to be well worth following up.
4. A statement on behalf of the Joint Mission was made by Mr. Peter Rogers (ESCAP). The background to the Typhoon Committee's activities in community preparedness and disaster prevention was explained and the purposes of the follow-up visit outlined. In response to a question on the distribution of Joint Mission reports, it was agreed that they should be made available to all concerned.

5. The two Hong Kong participants in the Tokyo Regional Seminar on Community Preparedness and Disaster Prevention reported to the meeting their views on the usefulness of that seminar and the applicability to Hong Kong of what they had learned from it. Three recommendations had been made to the Government as a consequence of the seminar:

(a) A review be made to ensure that the maximum was done to remove people from risk;

(b) A standing Committee be set up to keep CP/DP arrangements in Hong Kong under review;

(c) Departmental emergency instructions in Hong Kong be reviewed: not in order to combine them into a single manual, but to see that they are drawn up in accordance with a common pattern.

6. Reference was made to the recommendation of the 1973 Joint Mission for a dedicated meteorological broadcast. It was pointed out that the case for such a broadcast had not been considered strong enough and the recommendation had not been implemented. However, the same problems still existed, and requests for technical information from users could not be met in times of emergency. The telephone system did not always work, and the number of staff available to give information was not always enough. A dedicated broadcast could solve all such problems. It was accordingly the view of the meeting, with the full support of the Joint Mission, that a further examination of the possibility of establishing a dedicated meteorological broadcast should be made by the Hong Kong authorities as soon as possible.

7. The co-ordination of post-disaster relief and rehabilitation was also considered. The representative of the Red Cross said that his organizations' activities were co-ordinated with those of the Social Welfare Department. On occasion, information on the number of persons requiring relief was insufficient to act upon and not enough use was made of volunteers. It was sometimes disappointing for volunteers if their services were not used. It was agreed that those problems would be looked into by the appropriate departments.

8. The representative of the Royal Observatory informed the meeting that a Storm Surge Unit had been set up to improve forecasts of surges. With the help of expanded computer facilities, objective methods were being used to

forecast typhoon movement and intensity. A video time-lapse system was being used with the radar to help in the location of poorly-defined typhoons. A point-to-point telecommunication link had been established between Peking and Hong Kong.

Conclusions

9. As the Joint Mission had found in 1973, the protective system against typhoons and other disasters in Hong Kong is highly effective. Although the system has not been given formal or legislative status, the responsibilities of those concerned are clearly set forth at departmental level. As reported in paragraph 3 above, consideration is at present being given to the setting up of a group to give policy guidance to the Government. The Joint Mission is of the opinion that such a group would be very useful in Hong Kong and would further strengthen the firm methods already used in coping with disasters.
10. The level of awareness of disasters among the population appears to be singularly high (the hotel in which the Mission team stayed provided a printed sheet giving "Typhoon Safety Advice" in every room).
11. The question of instituting the meteorological broadcast already recommended in 1973 (see paragraph 6 above) is obviously not an easy one in all respects. Nevertheless, the Mission does regard it as one of considerable importance and expresses the hope that the possibility of introducing it will receive further serious consideration.

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List of participants

Mr. H.M.A. Bristow	Principal Assistant Secretary, Colonial Secretariat
Mr. D. Blain	Security Branch, Colonial Secretariat
Mrs. E.M. Howe	Security Branch, Colonial Secretariat
Mr. Law Chi Kin	Social Welfare Department
Mr. Lu Yu Hua	• Social Welfare Department
Mr. I.R. Strachan	Social Services Branch
Mr. R.H. Parry	Marine Department
Mr. Lam Chek-yuen	Fire Services Department
Mr. Chan Chun Ying	Civil Aid Services
Mr. E. McCosh	Royal Hong Kong Police Force
Mr. P. Sham	Royal Observatory
Mr. G.A.G. Sapstead	Public Works Department
Mr. H. McAteer	Public Works Department
Mr. N.T. Whitworth	Public Works Department
Mr. T.C. Chau	Agriculture and Fisheries Department
Mr. J.C.C. Walden	Director of Home Affairs
Dr. P.K. Wong	Medical and Health Department
Mrs. Edith Li	Hong Kong Red Cross
Mr. Francis Leung	Hong Kong Red Cross
Mr. Thomas Sinn	Hong Kong Red Cross
Lt. Col. Lawrence Weggery	Salvation Army
Major Gilden	Salvation Army
Dr. Kingsley J. Seevaratnam	LRCS
Mr. F. Pimenta Alves	WMO
Mr. Peter Rogers	ESCAP

Report on Informal Discussions with the Philippine
Authorities as a follow-up to the Joint LRCS/WMO/ESCAP Mission
on Community Preparedness and Disaster Prevention
(Manila, 9 July 1976)

Introduction

1. The Joint Mission to the Philippines took place in May 1974 and a short follow-up visit for informal discussions took place on 11 October 1974 in conjunction with the seventh session of the typhoon Committee. At its eighth session, the Committee included in its programme of work for 1976 further informal discussions with the Philippine authorities on CD/DP matters.

2. In consultation with the Philippines, arrangements were made for a meeting of those concerned and the members of the Joint Mission. The meeting was held in the Office of the Administrator, PAGASA, on 9 July 1976. It was attended by 25 persons, representing six government departments, the Philippine National Red Cross (PNRC), the Typhoon Committee secretariat (TCS) and the three organizations forming the Joint Mission. A full list of the participants is attached to this report. The chair was taken by Mr. Catalino Arafiles.

Discussion

3. An opening statement was made on behalf of the Joint Mission by Mr. Peter Rogers (ESCAP). The background to the Typhoon Committee's activities in community preparedness and disaster prevention was explained and the purposes of the follow-up visit outlined. A short summary of the main features of the Seminar that had just taken place in Tokyo was also given.

4. A wide-ranging discussion on CP/DP activities in the Philippines then took place with the participation of many of those present. Throughout this discussion there was a dominant and recurrent theme - the difficulties experienced by the Philippines in ensuring the effective dissemination of typhoon and flood warnings. Those problems had featured prominently in the report of the 1974 Joint Mission and, though some limited progress had been made, it was evident that the major problems remained unsolved. In outlying areas of the Philippines, warnings were still delayed by hours or even days, so that the population was unprotected.

5. Reference was made to the special arrangements agreed with the Bureau of Telecommunications (BOT) to give absolute priority to typhoon warnings. It was noted that, despite that arrangement, warnings were still frequently subject to serious delay. It was also noted that the BOT links were not manned 24 hours a day, thereby making delay inevitable at some hours of the day. Outages on BOT links were another frequent source of delay or non-receipt of typhoon warnings. As the Joint Mission had found in 1974, the facilities available at BOT are inadequate to meet the responsibilities placed upon it.

6. Further shortcomings in the communications arrangements for warning dissemination exist between PAGASA and some of the national agencies in the Manila area. A good VHF link exists between PAGASA and its newly established 10-kW radio station through which typhoon warnings are regularly broadcast. The existing landline links between PAGASA and the Philippine News Agency (PNA) and BOT need improvement by establishment of VHF links.

7. The vital importance of immediate action to improve the present arrangements was agreed by all present. However, it was also recognized that only limited funds were available and that there were competing requirements to be met from those funds. The representative of the Budget Commission stated that the agencies concerned should submit requests for funding of the essential telecommunication facilities necessary for timely dissemination of typhoon warnings. It was felt that full use should be made of all existing national communication systems in times of emergency. It was accordingly recommended that PAGASA, taking into account the recommendations already made by TCS and the Joint Mission, and in close co-operation with all the national bodies concerned, should:

(a) Develop an interim communication plan which would make use of all available telecommunication circuits to ensure the timely and effective dissemination of typhoon warnings;

(b) Initiate the studies necessary for the later adoption and implementation of a national typhoon warning communication system capable of alerting those responsible for the protection of human life and property throughout the territory of the Philippines.

8. Other topics treated during the discussion included test exercises and training in disaster preparedness. It was generally agreed that there was no real need for test exercises in the Philippines, the frequency of actual disasters being such as to give all the practice necessary in the operation of the system. The PNRC representative reported that training in disaster preparedness, relief and first aid was being carried out all over the Philippines. Training programmes being conducted by government agencies included three-day workshops on disaster preparedness at the village level.

9. The representative of the Department of Education and Culture confirmed that the new programme for education in typhoon and flood dangers, drawn up in co-operation with PAGASA, had been incorporated in school curricula at the elementary and secondary levels. Text-books for Grades 1 to 4 had recently been revised to include appropriate texts.

10. A recent typhoon (May 1976) had confirmed the effectiveness of the pilot flood-forecasting system installed in the Pampanga River basin. The Government of the Philippines had decided to proceed with the installation of similar systems in several other river basins. External aid would be sought for that purpose.

Conclusion

11. There continues to be an active response to the need for community preparedness and disaster prevention in the Philippines. However, the above paragraphs clearly show that, although some important improvements have come about as a result of the establishment of the PAGASA 10-kW radio station, serious shortcomings remain in the arrangements for the distribution of typhoon warnings. This is a basic defect in the system which should be remedied at the earliest moment. As was stressed by the 1974 Joint Mission, the cost of perfecting the distribution system would be small in relation to the large sums expended in the preparation of warnings, or to the potential savings in lives and damage.

List of participants

Mr. Catalino P. Arafiles	PAGASA
Mr. Manuel C. Bonjoc	PAGASA
Mr. Wellington A. Minoza	PAGASA
Mr. Juanito F. Lirios	PAGASA
Mr. Virgilio F. Balagot	PAGASA
Mr. Justo B. Valbuena	PAGASA
Mr. Juan F. Asuncion	PAGASA
Mr. Eduardo M. Parong	PAGASA
Mr. Federico Z. Jambalos	PAGASA
Mr. Ruben N. Encarnacion	PAGASA
Mrs. Esmeria P. Silva	Department of Social Welfare
Mr. Ernesto B. Reyes	Bureau of Public Works
Mr. Alberto Valdez	Bureau of Public Works
Mr. Isauro S. Ancheta	Department of Local Government and Community Development
Mr. Lino S. Catequista	Department of Local Government and Community Development
Mr. Ramon Abad	Budget Commission
Dr. Lorenzo Ga. Cesar	Department of Education and Culture
Dr. Mariano F. Beltran	Philippine National Red Cross
Mr. Peter Rogers	ESCAP
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Dr. Kingsley J. Seevaratnam	LRCS
Dr. S.N. Sen	TCS
Mr. C.H. Tang	TCS
Mr. A. Hamamori	TCS
Mr. M.T. Asuncion	TCS