



**UNITED NATIONS ECONOMIC AND SOCIAL COMMISSION**

**FOR ASIA AND THE PACIFIC**

**AND**

**WORLD METEOROLOGICAL ORGANIZATION**

**REPORT OF THE TYPHOON COMMITTEE**

**ON ITS NINETEENTH SESSION**

**Bangkok, Thailand  
28 October - 3 November 1986**

FOR PARTICIPANTS ONLY

WRD/TC.19/6  
19 November 1986

ORIGINAL: ENGLISH

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

Typhoon Committee

Nineteenth session  
28 October-3 November 1986  
Bangkok

REPORT OF THE TYPHOON COMMITTEE  
ON ITS NINETEENTH SESSION

I. ORGANIZATION OF THE SESSION

1. The nineteenth session of the Typhoon Committee was held at Bangkok from 28 October to 3 November 1986.

Attendance

2. The session was attended by representatives of China, Democratic Kampuchea, Hong Kong, Japan, Malaysia, the Philippines, the Republic of Korea, Thailand, and Viet Nam. Observers from France, Indonesia and the Union of Soviet Socialist Republics attended the session. Observers were also present from the Committee for Co-ordination of Investigations of the Lower Mekong Basin, the International Civil Aviation Organization (ICAO), Asian Disaster Preparedness Center-AIT, Joint Typhoon Warning Center-Guam, the Technical Support Unit (TSU) of the WMO/ESCAP Panel on Tropical Cyclones and RA V Tropical Cyclone Committee for the South Pacific. The United Nations Development Programme (UNDP) was also represented at the session.

Opening address

3. Opening addresses were made by the Officer-in-Charge of ESCAP and the representative of the Secretary-General of WMO.



4. In delivering the Executive Secretary's message the Officer-in-Charge of ESCAP welcomed the participants. He recalled that serious typhoons had affected some of the Members of the Committee and urged the Committee and its Members to promote activities for disaster prevention and preparedness (DPP) component as well as other components in its work programme. He also drew the Members' attention to the financial crisis besetting the United Nations and stressed the necessity of the Member's cash contributions for institutional support to the Committee.

5. The representative of WMO, on behalf of the Secretary-General, welcomed participants to the session and thanked ESCAP for its excellent hosting arrangements. He recalled the adoption of a Regional Co-operation Programme at the extraordinary session of the Committee on 21 March 1986 in Manila and emphasized the need to strengthen inter-agency co-operation to enable the Committee to receive the fullest support in the implementation of its programmes. He thanked UNDP for its support to the activities of the Committee and appreciated the financial and technical support from some Members, especially Japan and the Philippines. He shared the concern of ESCAP on budgetary constraints but felt that through the streamlining of support much could be accomplished with the available resources.

#### Election of officers

6. The Committee elected Mr. P. Sham (Hong Kong) as Chairman and Mr. C. Arafles (Philippines) as Vice-Chairman. Dr. Lim Joo Tick (Malaysia) was elected Chairman of the Drafting Committee.

#### Agenda

7. The Committee adopted the following agenda:

1. Opening of the session.
2. Election of officers.
3. Adoption of the agenda.
4. The Committee's activities during 1986:
  - (a) Meteorological component;
  - (b) Hydrological component;
  - (c) Disaster prevention and preparedness component;

/(d)

- (d) Training;
- (e) Research.
5. Review of the 1985 and 1986 typhoon seasons/annual publication.
6. Co-ordination with other activities of the WMO Tropical Cyclone Programme.
7. Programme for 1987 and beyond.
8. Support required for the Committee's programme.
9. Consideration of the agenda for the twentieth session.
10. Date and place of the twentieth session.
11. Scientific lectures.
12. Adoption of the report.

#### II. THE COMMITTEE'S ACTIVITIES DURING 1986

8. The Committee reviewed and evaluated in detail its activities during 1986.

##### A. Meteorological Component

(Agenda item 4 (a))

9. The Committee noted with satisfaction that a great deal of progress had been made by Members in 1986 in particular the provision of services of the Geostationary Meteorological Satellite (GMS-3) by Japan and additional radars and upgrading of telecommunication facilities by TC Members to support improved typhoon and flood forecasting.

10. The Committee welcomed the view that the Regional/Specialized Meteorological Centre (RSMC) upon its establishment should develop links with the European Centre for Medium Range Weather Forecasting (ECMWF) for exchange of views, scientific information and products with the aim of improving forecasts and warning services.

11. The Committee noted with satisfaction on the successful compilation of the Annual Review of 1985, report on research activities of the meteorological component and progress in the preparation of the Typhoon Committee Operational Manual (meteorological component). In this connection,

/the Committee



the Committee expressed its appreciation to the Chief Editors Mr. C.Y. Lam and Mrs. Elaine Koo of Hong Kong, the National Editors, and both Dr. T. Kitade and Dr. T. Nitta of Japan Meteorological Agency (JMA) for their painstaking efforts in accomplishing such essential tasks. The Committee further noted with gratitude that Hong Kong and Japan would continue to undertake the same work in the years ahead.

12. The first draft of a Typhoon Committee Operational Manual, which had been prepared by the WMO secretariat, was intensively modified, improved and updated by the rapporteur, Dr. Nitta, and his colleagues in line with the suggestions of the Committee. The second draft was produced in June 1986 and distributed to the focal points for the meteorological component of the Committee's programme, the WMO, ESCAP and Typhoon Committee Secretariat (TCS) for their comments and necessary information.

13. Taking into account their comments and supplementary information, the final version of the draft was prepared by the rapporteur in September and distributed to Members prior to the the nineteenth session of the Typhoon Committee (TC-19).

14. The final version was presented to the session by the rapporteur, and examined and discussed by the Typhoon Committee. The Committee finally adopted the Typhoon Committee Operational Manual for the meteorological component and requested its editing and publication by WMO in Tropical Cyclone Programme (TCP) series as soon as possible.

15. The Committee was pleased to learn that the international conference on the Development of Meteorological Techniques was organized under the sponsorship of the Japan Foundation for Shipbuilding Advancement (JAFSA) in which six TC Members benefitted through their participation. A similar international conference on severe weather forecasting scheduled to be held in Tokyo in middle of November 1986 will again be sponsored by JAFSA. The Committee expressed gratitude to JAFSA for its general support in the organization of these significant conferences. JMA was commended for its endeavors in arranging such essential conferences for the benefit of Members and the Committee expressed its hope that this effort will continue in the future.

16. The Committee was also pleased to learn that a meeting was organized by the Royal Observatory, Hong Kong in May 1986 for the purpose of encouraging commercial ships to keep on providing more ship reports from data sparse ocean areas. Members were called upon to take similar appropriate steps.

17. The Committee noted with appreciation the continued effort of Japan to improve the provision of GMS information. Hourly transmission of polar stereographic projection pictures for the Far East region in low resolution form would be made available to Members starting from 1987 with a view to ensuring better forecast and warning services to the region.

18. New GMS information will be transmitted in digital form eventually to replace the high resolution facsimile pictures starting in 1988, that would necessitate the replacement or modification of existing satellite receivers at Medium-scale Data Utilization Stations (MDUS). The Committee therefore urged Members to take appropriate action in advance so as to overcome any difficulties which might be encountered in receiving satellite information. The Committee recommended that Members may acquire relatively simple and inexpensive low resolution satellite ground receivers for receiving low resolution satellite pictures during the time of modification of the existing high resolution equipment or procurement of new ones.

19. Some Members faced difficulties in acquiring adequate spare parts and consumables to operate the existing sophisticated equipment e.g. radiosonde/radiowind, radars, satellite receivers and telecommunication facilities. This was mainly due to the shortage of funds and foreign exchange. The Committee hoped that WMO, ESCAP and TCS would explore all possible avenues to assist Members in overcoming this problem. The Committee was also informed of the World Weather Watch (WWW) Implementation Support Revolving Fund established by the Executive Council of WMO to meet emergency needs.

20. The Committee realized that there was also a need for external assistance to surmount difficulties facing some Members in data collection and exchange. The Philippines requested assistance from Japan for the establishment of a modern telecommunication network to improve data collection and transmission. The arrangements for assistance were in progress. In Thailand, a large amount of resources was needed for the improvement of the



operation of Regional Telecommunication Hub (RTH) in Bangkok. External assistance is obviously needed to renovate the facilities which have been in use for more than two decades. Likewise assistance was also needed for improving the telecommunication system in Viet Nam.

21. The Committee noted with satisfaction the increasing use by Members of products of the European Centre for Medium Weather Forecast (ECMWF) and UK meteorological service to improve their medium range forecasts.

22. The Committee expressed its appreciation to the United States for providing valuable meteorological information through their aircraft reconnaissance operations and hoped that the same operations would be carried out in the years ahead.

23. The Committee revised the priority list as shown in Appendix (A).

B. Hydrological component  
(Agenda item 4(b))

24. The Committee reviewed the activities implemented under the hydrological component during 1986 on the basis of the information reported at the session.

25. The Committee noted with satisfaction the continued efforts made by Members in improving their existing flood forecasting and warning systems and installing new systems.

26. The Committee was pleased to note that a number of Members continued to carry out monitoring flood forecasting systems as an on-going activity under the hydrological component using the methodology developed during the Typhoon Operational Experiment (TOPEX) and amended as agreed at the seventh session of the Committee. That activity was seen as having a central role in the Committee's programme of work including the increased meteorological inputs to flood forecasting. The Committee therefore called on all Members who had monitored their systems under TOPEX to continue to do so and invited Members to designate and monitor additional flood forecasting systems. Members were also requested to submit their monitoring reports to WMO, ESCAP and TCS by 1 June of the following year. The Committee expressed its appreciation to the Government of Japan for continuing the secondment of an expert in hydrology to the TCS after mid-September 1986.

27. The Committee felt it necessary to discuss the use of Satellite for transmission of data for flood forecasting.

28. The Committee noted with appreciation that a Hydrological Operational Multipurpose Subprogramme (HOMS) seminar supported transfer of flood forecasting technology in November 1986 in Nanjing, China.

29. The Committee was informed that Malaysia, through the International Hydrological Programme of UNESCO, planned to organize a workshop on "Impact of Operations in Natural and Plantation Forests on Conservation of Water Resources", from 18 to 22 June 1987, in Kuala Lumpur. The Philippines, under the Major Regional Project (MRP), would organize a workshop on Flood Risk Analysis and Mapping (FRAM) in Manila in 1987.

30. The Committee was informed that a regional HOMS workshop on hydrological measurements in tidal area would be held in Bangkok, Thailand, from 17 to 25 November 1986.

31. The Committee also noted with satisfaction the continued efforts by WMO in the regional HOMS activities and a workshop on Han river forecasting conducted by the Government of Korea.

32. The Committee expressed the view that the work programme should increase the training activity, particularly the Technical Co-operation among Developing Countries (TCDC) arrangements for exchange of visits of scientists/experts between Members.

33. The Committee was informed that the Government of the Republic of Korea would welcome use of the Han river basin flood forecasting and warning system for exchange visits and/or attachments of experts from Members under the TCDC or other appropriate arrangements. The Committee was pleased to note the offer of the Ministry of Construction of the Republic of Korea for exchange visits and/or attachment of experts to its Han River Flood Forecasting and Warning System and the willingness of the Meteorological Service of the Republic of Korea to provide and/or exchange computer software with TC Members.

34. The Committee was informed that the Government of Japan had already seconded an expert in flood risk analysis and mapping to Malaysia under bilateral arrangements in July 1986.



35. The representative of the Government of Thailand informed the Committee that a seminar on Flood Protection and Drainage Project in Bangkok and its Vicinity was held jointly by the Government of Thailand and Japan with the technical assistance of ESCAP at Pattaya in January 1986. Subsequently, monthly meetings on flood risk analysis and flood plain management in Bangkok and its vicinity were planned and initiated by Bangkok Metropolitan Administration (BMA) with technical assistance of ESCAP. He expressed his appreciation for the assistance of the Government of Japan and ESCAP and hoped for their continued support.

36. The Committee was informed that ESCAP had published the proceedings of the expert group meeting on the improvement of disaster prevention systems based on risk analysis of natural disasters related to typhoons and heavy rainfall held from 8 to 13 July 1985.

C. Disaster prevention and preparedness (DPP) component  
(Agenda item 4(c))

37. The Committee reviewed the activities of Members under this component of the programme and noted with satisfaction the high degree of implementation of the recommendations made at the eighteenth session to further improve mitigation of damages caused by typhoons and related floods.

38. The Committee reviewed the draft of a National Disaster Report presented by UNDRO at the previous session and expressed its appreciation for the special effort made by UNDRO. The Committee postponed to its next session the discussions on the draft guidelines and supplementary explanation submitted by UNDRO.

39. The Committee deemed it necessary to increase opportunities for communication among Members and the organization of seminars/training courses on DPP, especially on the proposed Disaster Information Compilation Systems and the National Disaster Report and urged UNDRO and LRCS to make the appropriate arrangements.

40. Members submitted damage survey reports using the standard format. In addition, TCS distributed to Members a special damage survey form which required more precise and detailed information on damages wrought by all natural disasters including the appropriate response made by government and

/private sectors

private sectors in terms of rehabilitation/restoration costs for the period 1970 to 1985. It is envisioned that the survey results would provide national planners with essential inputs to cost-benefit studies on expenditures for damage mitigation and prevention.

41. An "ASEAN Natural Disaster Experts Conference" organized by the Ministry of Interior and local agencies concerned will be held at Bangkok during the first half of 1987.

D. Training component  
(Agenda item 4(d))

42. The Committee reviewed the activities under this component of its programme.

43. The Committee was pleased to note that Members continued taking advantage of training opportunities for their staff in operational work, maintenance of facilities and services such as:

- a) A training course on Tropical Meteorology and Tropical Cyclone Forecasting was organized by the University of Miami and NOAA, USA in co-operation with WMO at the University of Miami, Florida, from 17 February to 25 April 1986 in which participants from the Typhoon region were supported from regional project funds;
- b) WMO/HOMS Workshop on the use of microcomputers in Hydrology held in New Zealand from 17 to 21 March 1986; and
- c) A training course on Hydrological Forecasting held at the University of California, USA from 7 July to 3 October 1986.

44. As proposed by the Committee, WMO organized exchange visits to hydrological forecasting systems for experts of each Member in this field. Three experts from China and one each from the Philippines and Hong Kong visited flood forecasting systems in China, Hong Kong, the Philippines and Malaysia. The visits were very successful and were considered as an innovation in technology transfer and technical co-operation among developing countries. Members had expressed their views that similar visits be organized in the future within the framework of the Committee's plans in this area.



45. An updated list was prepared by TCS upon the request of the Committee concerning the offer of facilities and the requirements of Members of training and attachments and exchange of experts/scientists including study tours. The list has since been sent to WMO for possible funding under the scheme. Members were advised to follow-up individually their request with WMO.

46. Under the TCDC scheme, several exchange visits have taken place. In late 1985, two senior forecasters from China visited the Philippines. In turn, China sponsored an exchange visit for two operational forecasters from the Philippines to Beijing and Shanghai from mid-July to the end of August 1986. In response to a call from the Committee, China's State Meteorological Administration (SMA) organized a 2-week study tour of its tropical cyclone forecasting facilities and techniques for scientists from TC Members in July 1986. The study tour covered Shanghai, Xiamen, Shantou and Guangzhou.

47. In addition, two senior forecasters from China assisted the Thai Meteorological Department on numerical weather prediction techniques in early 1986 with financial assistance from the regional project funds.

48. The Asian Disaster Preparedness Center (ADPC), recently established by the Asian Institute of Technology with technical advice from UNDRO in co-operation with WMO, invited TC Members to its first Disaster Management Course. Further information on the ADPC was provided by its Director, Mr. B. Ward, as the subject of one of the scientific lectures during the session.

49. In anticipation of the implementation of the Regional Co-operation Programme particularly RSMC, the Committee endorsed the suggestion that ways and means be found (i.e. travelling missions, seminars, conferences) for JMA forecasters and Numerical Weather Products (NWP) experts to share their expertise with TC Members. WMO and TCS were requested to investigate available possibilities.

50. The Committee noted with appreciation the organization of the following seminars/training courses by the Government of Japan in which participants from TC Members were accommodated:

/(a)

- (a) Seminar in technology disaster prevention,
- (b) Training on river engineering, and
- (c) Group training course in meteorology

51. A fellow from China, one of seven taking graduate courses at the Regional Meteorological Training Center, University of the Philippines, under either WMO/Voluntary Co-operation Programme (VCP) or WMO/UNDP programme, successfully defended his doctorate thesis in meteorology in September 1986.

52. The TCS provided on-the-job training on radar operation, calibration and trouble shooting in Malaysia and Thailand to a total of 17 technicians.

53. The Committee requested WMO to provide information on forthcoming training courses, seminars, and workshops well in advance to enable interested Members to take appropriate steps in time to participate in these training events.

54. The Committee was pleased to learn that a study tour on tropical cyclone forecasting facilities and techniques organized by China in which scientists from Hong Kong, Japan, Malaysia, the Philippines and Thailand participated was successfully completed. The Committee was also pleased to learn of the willingness of China to sponsor a 10-day study tour on tropical cyclone forecasting techniques and facilities during the 1987 typhoon season subject to TC Members making appropriate representations through WMO and subject to further consultations with China. The Committee recommended that more of such study tours should be arranged in the future.

E. Research component  
(Agenda item 4(e))

55. The Committee noted with satisfaction Members' efforts in research on the three major components of its programme. It also noted the continuation of post-TOPEX activities in all components. For this reason the Committee designated Messrs. C.H. Sea (Malaysia) and V.R. Pagulayan (Philippines) as Research Co-ordinators for the hydrological and disaster prevention and preparedness components, respectively. It also expressed its appreciation to Dr. T. Kitade (Japan), Meteorological Research Co-ordinator, and the research correspondents of Members, for their progress report.

/56.



56. To emphasize the importance of promoting activities on Disaster Prevention and Preparedness (DPP), an international seminar on Regional Development Planning for Disaster Prevention was organized in Japan in September 1986 by the United Nations Centre for Regional Development (UNCRD) co-sponsored by UN/DTCD, WMO, FAO, UNESCO, UNDRO, and UNCHS (Habitat). Scientists from TC Members, notably Philippines and Japan, presented technical papers.

57. The WMO International Workshop on Tropical Cyclones (IWTC) was held in Bangkok in late 1985, co-sponsored by UNDP and US Office of Foreign Disaster Assistance (OFDA). IWTC recommended, among other things, the organization of major workshops on tropical cyclones every four years, and regional workshops on a similar basis.

58. In the recently concluded Ninth Session of the Commission for Atmospheric Sciences at Sofia in October 1986, the Commission re-emphasized "the need to strengthen the links between the research community and forecasters by maintaining close contact with regional tropical cyclone bodies within the WMO Tropical Cyclone Programme (TCP)". The Committee believes that closing the communication gap between researchers and operational forecasters will enhance chances of evolving better techniques at forecasting tropical cyclones.

### III. REVIEW OF THE 1985 AND 1986 TYPHOON SEASONS/ANNUAL PUBLICATION (Agenda item 5)

59. The Committee at its fourteenth session had decided to include in its subsequent sessions a review of the previous typhoon seasons. At the nineteenth session, the review covered the period from 1 September 1985 to 31 August 1986. Country papers prepared by Members contained information on typhoons and associated floods and their corresponding damage, in accordance with the format in the "Report on damage caused by cyclones, floods and drought" adopted by the Committee.

60. A summary report of the country papers was presented and distributed to all participants by TCS during the session.

61. The Committee noted with satisfaction that the first issue of the "ESCAP/WMO Typhoon Committee Annual Review 1985" was successfully prepared by the Chief Editor from Hong Kong assisted by editors of each Member of

/the Typhoon

the Typhoon Committee. The Annual Review will be distributed to Members of ESCAP and WMO, and other concerned agencies shortly. The Committee expressed its appreciation to the Chief Editor from Hong Kong and other editors of TC Members for their painstaking efforts at accomplishing such a vital task. The Committee also expressed its appreciation to UNDP for the financial support for the Annual Review.

62. The Committee decided to continue the publication and in response to the strong request of the Committee, Hong Kong agreed to continue to provide the Chief Editor for another year.

63. The Committee considered that the contents of the publication should be reviewed taking into account the comments made by the Member at the session and other comments from readers of the publication.

### IV. CO-ORDINATION WITH OTHER ACTIVITIES OF THE WMO TROPICAL CYCLONE PROGRAMME (Agenda item 6)

64. The Committee noted the information provided in the twelfth status report on the implementation of the WMO Tropical Cyclone Programme (TCP) and additional information presented at the session by the representative of WMO.

65. The Committee was pleased to learn that the revised version of the report on "Tropical Cyclone Warning Systems" and the draft manuscript on "Counter-attack: the story of the Typhoon Operational Experiment (TOPEX)" were being finalized by the WMO Secretariat for publication in TCP series in early 1987.

66. The Chairman of the RA V Tropical Cyclone Committee for the South Pacific stated that since his Committee was the youngest regional body of the TCP, it looked upon the vast experience of the Typhoon Committee for guidance on its activities in tropical cyclone mitigation in the South Pacific. Following his statement, the Committee requested WMO to arrange for active exchange of information and co-operation between the two regional bodies, especially on the subject of transfer of technology.

/67.



67. The co-ordinator of the Technical Support Unit (TSU) for the Panel on Tropical Cyclones proposed to stimulate exchange visits for meteorological and hydrological forecasters between the regional tropical cyclone bodies. The Committee agreed with this suggestion and recommended that the exchange programmes should be intensified not only within the typhoon region but also between the adjacent regional tropical cyclone bodies with TCDC arrangements.

V. PROGRAMME FOR 1987 AND BEYOND  
(Agenda item 7)

68. In considering its programme for 1987 and beyond, the Committee took into account the on-going programme of work, the modified medium- to long-term programme and the Regional Co-operation Programme it had adopted.

69. The Committee re-affirmed the establishment of RSMC in Tokyo and recommended its formal inclusion in the World Weather Watch (WWW) following the principles and mechanisms described in the WMO Second Long-Term Plan and/or WMO Technical Regulations.

70. The Typhoon Committee Operational Manual (meteorological component) will serve as a basis for carrying out the operations of the Regional Co-operation Programme.

71. The Committee noted with appreciation the activities undertaken in the hydrological component and expected further technical exchanges including exchange visits for training and research to be performed in 1987 and beyond.

72. The Committee endorsed in general the programme for 1987 and beyond as discussed at this session and urged Members to make every effort to implement it and in addition to their national programmes.

73. The Committee also urged Members to identify the order of priority for the implementation of the programme other than the national programme and indicate whether external assistance is required.

74. The Committee was pleased to note that the USSR would continue to support the Typhoon Committee activities mainly on bilateral basis and was ready to provide assistance in technology, training and research through the VCP.

VI. SUPPORT FOR THE COMMITTEE'S PROGRAMME  
(Agenda item 8)

75. The Committee considered the support needed for institutional arrangements and programme activities on the basis of a document presented to the Committee by WMO and ESCAP.

76. ESCAP informed the Committee that due to the financial crisis faced by the United Nations it would no longer be in a position to reproduce documentation for the Typhoon Committee sessions with funds from its regular budget and that further implications of the financial crisis would be conveyed to the Typhoon Committee Secretariat and the World Meteorological Organization as they occur. In view of this it was decided in principle to omit the country reports from the session report. A suggestion was made that the country reports be included in the Typhoon Committee Annual Review. It was also recommended that each Member should bring along at least 50 copies of the country report to the sessions. The Committee also agreed that funding arrangements should be made by its Members for reproduction of documents for the future sessions.

77. The Committee had intensive discussions on the support required for its programme. The Committee firmly confirmed that the Typhoon Committee was a joint programme of ESCAP and WMO. ESCAP informed the Committee that it would continue to provide substantive support to the Committee including implementation of extrabudgetary project activities which are in line with ESCAP work programme.

78. The Committee was informed that the Philippines would continue to provide a co-ordinator and a meteorologist as well as host facilities for another year. The Committee expressed its thanks and gratitude to the Philippines for its kind offer. It also recorded its deep appreciation to Dr. R.L. Kintanar for his contributions and guidance to the Committee in his capacity as co-ordinator in the past years.

79. The Committee also accepted with thanks the offer of Japan to continue its support of a hydrologist in the TCS.

/80.



80. As regards the telecommunications/electronics expert (TEE) the Committee agreed that, due to the introduction of high technology and sophisticated electronic observing and telecommunication systems, there was a definite need for this position to be retained. It was also agreed that this post was, in fact, an integral part of the programme support to the Committee.

81. The Committee noted the statement by LRCS that it would continue to seek funding an expert on disaster prevention and preparedness. The Committee decided that a request be addressed to the Philippines Government to kindly consider the possibility, as an interim measure, to make Mr. V.R. Pagulayan available to carry out this work in the TCS on a part-time basis.

82. The Committee welcomed the announcement of the representative of the Republic of Korea that its Government would make cash contributions in 1987 to support the Committee's activities. The representative of China stated that its Government might have to re-consider its pledge to contribute cash the sum of \$12,000 per year to the Committee, if only a few Members were to participate in this concept of self-help in cash. The Committee, therefore, strongly urged all Members who had not done yet to make contributions in the nearest future.

83. The Committee reviewed the Draft Rules of the Typhoon Committee Trust Fund prepared by WMO, as requested by the Committee. Views were expressed on the merits and drawbacks of the Draft Rules. Questions were raised whether the funds should be raised only through one of the agencies, and whether the basic objectives of the Trust Fund could be met without a clearly stated concept of budgeting the minimal support in cash and in kind for the institutional functioning and programme of the Committee.

84. The Committee decided that the TCS, in co-operation with WMO and ESCAP, should establish such budgetary requirements and that the Trust Fund rules be amended in accordance with the discussion, for the next session of the Committee.

85. The Committee noted with appreciation the inclusion of programme support to the Typhoon Committee in the Fourth Cycle Intercountry Programme of UNDP. UNDP informed the Committee that its support for programme

/activities would

activities would be continued in the fourth cycle, and outlined the exercise underway to expedite finalization of the Project Document. The representative of the UNDP re-iterated that the objective of the new project was fully consistent with the expressed wishes of member governments and that the final Tripartite Review (TPR) for the on-going project would afford yet another useful opportunity for governmental requirements to be incorporated in the project document. The Committee hoped that any reduction in the amount from the previous cycle could be restored by additional funding. The Committee further hoped that UNDP support to its programme would continue to be forthcoming in the fifth programme cycle in view of the anticipated increase in activities with the adoption of the Regional Co-operation Programme. Members were reminded of the need to impress upon their respective national Aid Co-ordinators the importance of the Committee's programme so that it would be accorded a higher status and priority by UNDP.

86. The Committee endorsed the continuation of the TCDC arrangements as a practical means of supporting its activities. TCS was requested to continue updating the list of requests from Members with indication of national priorities in their requirements on TCDC assistance, if possible before the end of 1986.

87. The Voluntary Co-operation Programme (VCP) of WMO offered great potentials in support of the Committee's activities. The Committee, however, noted that this had not been fully exploited by Members who were urged to take full advantage of this unique system of mutual assistance. The Committee further reminded Members of the Executive Council-approved VCP Co-ordinated Programme for upgrading the Global Telecommunication System for South Asia and to submit their requests for assistance to the WMO secretariat.

88. The Committee noted other possible sources of support like bilateral assistance and the private sector. It recognized that support from the private sector was a lengthy process and that new approaches would have to be made. The Committee thanked the Japan International Co-operation Agency (JICA) for its support through bilateral agreements in providing equipment and training facilities to Members. Members were also urged to mobilize national resources to the extent possible to meet requirements for the implementation of their meteorological and hydrological services.

/VII.



VII. CONSIDERATION OF THE AGENDA FOR THE  
TWENTIETH SESSION  
(Agenda item 9)

89. The Committee requested the ESCAP and WMO secretariats, in close consultation with the TCS, to prepare the detailed agenda for the twentieth session. It was agreed that Members might propose to ESCAP, WMO and the TCS, by the end of February 1987 specific items which should be included in the agenda of the next session.

VIII. DATE AND PLACE OF THE TWENTIETH SESSION  
(Agenda item 10)

90. The Committee requested the ESCAP and WMO secretariats in consultation with TCS to decide on the date and venue of the twentieth session. However, in the event that there was no offer to host the session, the Committee felt that the ESCAP headquarters at Bangkok would be the most appropriate venue.

IX. SCIENTIFIC LECTURES  
(Agenda item 11)

91. The following scientific lectures were presented:

- (a) Operations and future plans of the JTWC by Mr. George Dunnavan (Deputy Director), and Mr. Frank H. Wells (Scientific Assistant), Joint Typhoon Warning Center (JTWC), Guam;
- (b) Activities of ADPC by Mr. Brian A.O. Ward, Director, Asian Disaster Preparedness Center (ADPC), Asian Institute of Technology (AIT);
- (c) New schedule of information service via GMS by Dr. T. Nitta, Telecommunications Counsellor, Forecast Department, Japan Meteorological Agency (JMA); and
- (d) Soviet Studies on Typhoon by Dr. R.F. Burlitsky, Scientific Staff, State Committee for Hydrometeorology, USSR

92. The following slide and videos were shown:

- (a) Foundation of River and Basin Integrated Communication (FRIC) (Slide presented by Mr. H. Takahashi, Director, River Division, Tohoku Regional Construction Bureau, Ministry of Construction, Japan);
- (b) Very short range weather forecast (Video presented by Dr. T. Nitta);

- (c) Typhoon WAYNE and Typhoon ELLEN (Video presented by Mr. P. Sham, Director, Royal Observatory, Hong Kong); and
- (d) GORKI (local term for storm surge) (Video presented by Group Captain (Retd) Jasimuddin Ahmed, Director, Bangladesh Meteorological Department and Co-ordinator, Technical Support Unit (TSU), WMO/ESCAP Panel on Tropical Cyclones). Subsequently a copy of the video tape was contributed to TCS.

93. The Committee expressed its thanks to the lecturers and for the presentation of slide and video films.

X. ADOPTION OF THE REPORT  
(Agenda item 12)

94. The Committee adopted its report on 3 November 1986.

/APPENDIX



Priority list as revised by the Typhoon Committee  
at its nineteenth session

Observing facilities

- (a) Upper-air stations
- |                                 |  |
|---------------------------------|--|
| 98223 Laoag (Philippines)       | 12 GMT radiosonde/rawin/<br>national/external assistance<br>needed |
| 98645 Cebu (Philippines)        |  |
| 47187 Cheju (Republic of Korea) | National/external assistance<br>needed                             |
- (b) Weather radar
- |   |  |
|---|--|
| Cheju (Republic of Korea)                       | National/external assistance<br>needed |
| Tanay (near Manila,<br>the Philippines)         | National project                       |
| Haiphong (Viet Nam)                             | External assistance needed             |
| Vientiane (Lao People's<br>Democratic Republic) | External assistance needed             |
| Khon Kaen and Chanthaburi<br>(Thailand)         | National/external assistance<br>needed |
- (c) Satellite receiving equipment (GMS/TIROS-N Satellite)
- |                    |  |
|--------------------|--|
| Hanoi (Viet Nam)   | External assistance needed             |
| Bangkok (Thailand) | National/external assistance<br>needed |

Telecommunication

- (a) Improvement of national data collection facilities
- |                                     |  |
|-------------------------------------|--|
| Lao People's Democratic<br>Republic | } National/bilateral<br>projects/external<br>assistance needed |
| Philippines                         |  |
| Viet Nam                            |  |
|                                     |  |
- (b) Regional telecommunication links
- |                             |   |
|-----------------------------|---|
| Bangkok-Hanoi (new circuit) | National project/external assistance needed |
| Beijing-Guanghou-Hong Kong  | National/bilateral project                  |
- (c) Other telecommunication facilities
- |  |  |
|--|--|
| Thailand - Strengthening of<br>RTH, Bangkok                                      | National/external<br>assistance needed |
| Malaysia - Improvement of<br>Kuala Lumpur-<br>Bangkok, Kuala<br>Lumpur-Singapore | National/external<br>assistance needed |