



ESCAP/WMO  
Typhoon Committee

# REPORT OF THE FORTY SECOND SESSION

Singapore • 25-29 January 2010

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# REPORT OF THE FORTY-SECOND SESSION OF TYPHOON COMMITTEE

**Singapore**  
**25-29 January 2010**

## **PART I – DECISIONS OF THE COMMITTEE**

1. The Committee at its Forty Second Session decided to:
  - a. Accept the recommendations submitted by Working Group on Meteorology (WGM) as expressed in **paragraph 65**.
  - b. Accept the recommendations submitted by Working Group on Hydrology (WGH) as expressed in **paragraph 87**.
  - c. Accept the recommendations submitted by Working Group on Disaster Prevention and Preparedness (WGDPP) as expressed in **paragraph 95**.
  - d. Accept the recommendation submitted by Training & Research Coordination Group (TRCG) as expressed in **paragraph 103**.
  - e. Accept the generous offer of Macao, China to host the TCS for second 4-years period from 2011 to 2014.
  - f. Accept the generous offer of Republic of Korea (RoK) to host the 43<sup>rd</sup> Session in January in 2011.
  - g. Request TCS to conclude the Memorandum of Understanding (MoU) between World Meteorological Organization (WMO) and Typhoon Committee Secretariat (TCS) referring to Typhoon Committee Trust Fund (TCTF) Arrangement and request WMO to provide legal review on behalf of the Committee.
  - h. Request concerned Members to submit, in the next Session, the replacement names for typhoon KETSANA, MORAKOT and PARMA in accordance with the Committee procedures.
  - i. Request the AWG to present a theme for the Integrated Workshop 2010 based on suggested Session themes by 15 March 2010.
  - j. Approve and implement the rules for the future Typhoon Committee (TC) publications under TC logo.
  - k. Approve the TC Annual Operating Plan 2010 submitted by Advisory Working Group (AWG) with modifications and details in Appendix XIX.
  - l. Approve an increase to the annual TC Budget ceiling from US \$100,000 to US \$120,000.
  - m. Approve additional budget increases for exceptional requirements if the Committee determines necessary.

- n. Approve the 2010 Budget as presented below, which includes US \$9,000 from carry-over funds:

Item	US \$				
	2009	2009	2010	2009	2010 Plus
	Allotment	Spent	Proposed	Carry-Over	2009 Carry-Over
<b>TCS</b>	<b>29,071.81</b>	<b>21,663.77</b>	<b>30,000</b>	<b>6,000</b>	<b>36,000</b>
<b>TRCG</b>	<b>32,000</b>	<b>27,635.91</b>	<b>18,000</b>	<b>0</b>	<b>18,000</b>
<b>WGM</b>	<b>13,000</b>	<b>12,065</b>	<b>19,000</b>	<b>0</b>	<b>19,000</b>
<b>WGH</b>	<b>19,000</b>	<b>14,647.50</b>	<b>16,000</b>	<b>3,000</b>	<b>19,000</b>
<b>WGDPP</b>	<b>13,000</b>	<b>7,941</b>	<b>18,000</b>	<b>0</b>	<b>18,000</b>
<b>AWG</b>	<b>23,000</b>	<b>17,107.06</b>	<b>19,000</b>	<b>0</b>	<b>19,000</b>
<b>TOTAL</b>	<b>129,071.81</b> (110,000 + 19,071.81 carry-over from 2008)	<b>101,060.24</b>			
<b>Total Budget for 2010</b> <i>(for details see Appendix XXI)</i>			<b>120,000</b>	<b>9,000</b>	<b>129,000</b>

- o. Accept the remaining recommendations of the AWG as expressed in **paragraph 137**.
- p. Request the AWG ensure “success indicators” reflect outcomes of action items in a way that clearly demonstrates how an action item benefits the Member(s).

## **PART II – PROCEEDINGS OF THE COMMITTEE**

### **I. ORGANIZATION OF THE SESSION**

2. The Forty-second Session of the ESCAP/WMO Typhoon Committee was held in Stamford Room, Parkroyal on Beach Road Hotel, Singapore, from 25 to 29 January 2010.
3. The Session was attended by 78 participants from 12 out of 14 Members of the Typhoon Committee, namely: Cambodia; China; Hong Kong, China; Japan; Macao, China; Malaysia; Philippines; Republic of Korea; Singapore; Thailand; the Socialist Republic of Viet Nam; and the United States of America (USA).
4. The Session was also attended by 5 observers from the Tokyo Polytechnic University International Association for Wind Engineering; from the Asian Disaster Reduction Center; from the Indonesian Agency for Meteorology Climatology and Geophysics (BMKG); Primorsky State Department of Hidrometeorology and Monitoring of Environment, Russia and the International Civil Aviation Organization (ICAO). Representatives from the Economic and Social Commission for Asia and the Pacific (ESCAP), the World Meteorological Organization (WMO) and Typhoon Committee Secretariat (TCS) also attended the session. The list of participants is given in Appendix I.

#### **Opening of the Session (agenda item 1)**

5. The Session was declared open by his Excellency, Dr. Yaacob Ibrahim, Minister for the Environment and Water Resources, at 9:25 am on Monday, 25 January 2010 in the Stamford Room, Parkroyal on Beach Road Hotel, in Singapore in the presence of the Members' representatives.
6. The following statements were delivered at the opening ceremony:
  - a. The welcome address of Mr Foong Chee Leong, Director-General of Meteorological Services Division, National Environment Agency, Singapore;
  - b. The address of Mr. Olavo Rasquinho, Secretary of Typhoon Committee in representation of the Chairman of Typhoon Committee.
  - c. The address of Dr. Tokiyoshi Toya, the representative of the WMO Secretariat.
  - d. The message of Dr. Wu Guoxiang, representative of ESCAP secretariat.
  - e. The inauguration address of His Excellency Dr. Yaacob Ibrahim, Minister for the Environment and Water Resources of Singapore.
7. The above-mentioned statements are given in Appendices II.a, II.b, II.c, II.d and II.e, respectively.
8. Dr. Roman L. Kintanar Award for Typhoon related Disaster Mitigation was presented to the Hong Kong Observatory.

### **II. ELECTION OF OFFICERS (agenda item 2)**

9. Mr. Foong Chee Leong, Director General, Meteorological Services Division, National Environment Agency of Singapore was elected Chairperson and Mr. Jin Gee-Beom, Director General of Forecast Bureau, Korea Meteorological Administration (KMA), was elected Vice-Chairperson of the Committee. Mr. Jeffrey LaDouce, Director of National Weather Service, NOAA-Pacific Region of USA was elected Chairperson of the Drafting Committee.

### **III. ADOPTION OF THE AGENDA (agenda item 3)**

10. The Committee adopted the agenda as shown in Appendix III.

#### **IV. PARALLEL SESSIONS OF METEOROLOGICAL, HYDROLOGICAL AND DISASTER PREVENTION AND PREPAREDNESS WORKING GROUPS (agenda item 4)**

11. Prior to the plenary session for the Committee, parallel sessions of the three Working Groups on Meteorology, Hydrology and Disaster Prevention and Preparedness were convened on the morning of 25 January 2010 in three separate meeting areas to review progress of work during the past year, to identify priorities for cooperation and make recommendations to the Committee.
12. The major outcomes of the parallel sessions of the three Working Groups were reported to the plenary session as given in the following sections.

#### **V. THE COMMITTEE'S ACTIVITIES DURING 2009 (agenda item 5)**

##### **(a) Meteorological Component (agenda item 5.1)**

13. The Committee took note of the outcome of the parallel session of the WGM which met on Monday, 25 January 2010. (Appendix IV)
14. The Committee reviewed the activities of Members to implement the TC Strategic Plan and its annual operating plan in relation to Meteorological Component during the past year. (Appendix V)
15. The Committee noted that Regional Specialized Meteorological Center (RSMC) Tokyo - Typhoon Center started issuing five-day track forecasts every six hours in addition to the existing three-day track and intensity forecasts. New tropical cyclone advisories (WTPQ50-55) include center positions and radii of probability circles for the fourth and the fifth forecast days.
16. The Committee was informed that RSMC Tokyo will discontinue the dissemination of alphanumeric Satellite Report (SAREP) and Radar Observation (RADOB) via the Global Telecommunication System (GTS) at the end of 2010 according to the migration plan that was agreed at the 41st Session of the Committee.
17. The Committee was pleased that RSMC Tokyo conducted a questionnaire survey on the present status of Members in using storm surge models in June 2009 and made a future plan for the provision of storm surge model guidance based on the survey.
18. The Committee expressed its gratitude to RSMC Tokyo, Japan, for its continued tropical cyclone advisory and warning services, as well as maintenance of the numerical typhoon prediction website, and implementation of the annual on-the-job training for typhoon forecasters. The activities of RSMC Tokyo in 2009 and implementation plan for the period of 2009 to 2013 are presented in Appendix VI.
19. The Committee was pleased that a number of workshops and training courses were held successfully during 2009 and were well attended by TC Members.
20. The Committee expressed its gratitude to Hong Kong, China for its continuous efforts in operating the Severe Weather Information Centre (SWIC) website for WMO, which continues to serve as a major channel for dissemination of real-time TC information worldwide.
21. The Committee noted with pleasure that the final assessment report on the impact of climate change on tropical cyclone frequency and intensity variation was finished and is planned to be published under the name of TC in 2010.
22. The Committee was informed that there are currently 24 synoptic stations and 200 rain gauges in Cambodia. The Public telephone, Facsimile and E-Mail are used for delivering the weather and flood forecasts and Tropical Cyclone Warnings to public in Cambodia.
23. The Committee was informed that China Meteorological Administration (CMA) began to issue official forecast for 96h TC tracks and conducted forecast experiments for 120h TC track. CMA plans to issue official 120h TC track forecast in 2010.

24. The Committee was informed that CMA developed and improved a seasonal ensemble prediction system in recent years, based on the analysis of relationship between TC tracks, intensity, frequency and genesis region and large-scale atmospheric circulations.
25. The Committee was informed that CMA developed and improved its typhoon damage assessment system for quasi-operational use in recent years. It provides pre-assessment damage information as follows: possible ruined houses, affected crop areas, immediate economic loss/rate, disaster index (TDCI), and severity categories.
26. The Committee was informed that CMA gets improvement in satellite system in 2009. FY-2E satellite of the FY-2 series has been put into operation in 2009. FY-2E is the third satellite of the FY-2 series and is the successor of FY-2C and FY-2D.
27. The Committee was informed that CMA gets improvement in Tele-communication system in 2009. The DVB-S data broadcasting system extended its receiving stations from 430 to 649 in 2009. Satellite-based data transmission services were switched from AsiaSat-2 to AsiaSat-5 successfully, which greatly increases the received S/N ratio. At present, the total broadcasting rate for the new system is 8.5Mbps, and the daily broadcasting data volume is over 36GB. The new data which is available via CMA's DVB-S includes CMA's NWP products generated by T639 model, FY-3 satellite observations and products, etc. CMA would like to update the Fengyuncast system for 6 Members.
28. The Committee was informed that CMA offered Typhoon Committee Research Fellowships taken up by Ms. NGUYEN Thi Minh Phuong (National Hydrometeorological Service of Viet Nam) and Mr. Chatchai CHAIYASAEN (Thai Meteorological Department) for the study of typhoon vortex initialization scheme and typhoon ensemble forecast techniques.
29. The Committee noted that a web-based application on automatic Dvorak analysis of tropical cyclones was developed in Hong Kong, China and is for trial use by forecasters. The Tropical Cyclone Information Display and Processing System (TIPS) was enhanced to support the construction of multi-ensemble forecast track and the overlay of TC strike probability information. Early notification of the issuance of tropical cyclone signal for increasing gale force winds and regular signal changes were communicated to the major transport operators and the container terminal respectively.
30. The Committee was informed that typhoons were sub-divided into typhoon, severe typhoon and super typhoon in Hong Kong China, to enhance public awareness on the potential threats of intense typhoons. A network camera was installed for remote monitoring of the weather and sea conditions at a beach of Hong Kong.
31. The Committee noted the outcome of an analysis of tropical cyclone activity in the western North Pacific and South China Sea and that making landfall along the south China coast. A slight but statistical insignificant decrease in the annual number of tropical cyclones making landfall within 300 km of Hong Kong was detected.
32. The Committee noted that Japan has improved its observation systems significantly by updating five conventional radars with Doppler radars, shortening the interval of weather radar observation, changing wind-finding method of radiosondes, and the shifting-over of meteorological mission from MTSAT-1R to MTSAT-2.
33. The Committee was informed that three regional and interregional circuits connected with Regional Telecommunication Hub (RTH) Tokyo migrated from Frame Relay services to an Multiprotocol Label Switching (MPLS)-based Internet Protocol-Virtual Private Network (IP-VPN) in March 2009 in order to avoid interruption of GTS operation due to the discontinuation of the Frame Relay service. The migration plan was coordinated by RTH Tokyo in cooperation with RTH Bangkok and NMCs Hong Kong and Manila. In addition, two Main Telecommunication Network (MTN) circuits connecting RTH Tokyo with World Meteorological Center (WMCs) Washington and Melbourne also migrated to the RA-VI Regional Meteorological Data Communication Network (RMDCN), which is operated over an MPLS based IP-VPN, in September and November 2009, respectively.

34. The Committee noted that JMA upgraded the operational mesoscale analysis system in April 2009 from a four-dimensional variational data assimilation system (Meso 4D-Var) based on a hydrostatic spectral model to a new 4D-Var (JNoVA) setup based on a nonhydrostatic grid model (NHM). This upgrade also included enhancement of the analysis resolution from 10 to 5 km horizontally and from 40 to 50 layers vertically. Twin month-long experiments both in summer and winter showed that quantitative precipitation forecasts (QPFs) were improved significantly by initializing the NHM with JNoVA rather than with Meso 4D-Var. In the case of Typhoon Wukong in 2006, the improved typhoon track forecast led to better forecasting of precipitation patterns.
35. The Committee was informed that JMA's Tokyo Climate Center (TCC) was designated as one of the first WMO Regional Climate Centers (RCCs) together with the China Meteorological Administration's Beijing Climate Center. TCC provides National Meteorological and Hydrological Services (NMHSs) in this region with basic climate data and products through its website.
36. The Committee was informed the outcomes of Reanalysis Project for Typhoon Vera (1959). It is concluded that it is deemed possible to obtain highly accurate predictions for Vera using the latest forecast techniques. An important consideration of this outcome is that the numerical model used in the present experiments is based on the operational version at JMA, suggesting high potential to predict the tracks and intensity of large typhoons such as Vera using the current operational prediction system.
37. The Committee was informed that JMA held the "International Workshop on Advancement of Typhoon Track Forecast Technique" in Tokyo, Japan from 30 November to 2 December 2009 as a follow up activity of The Observing System Research and Predictability Experiment (THORPEX) Pacific Asian Regional Campaign (T-PARC 2008). Some findings of T-PARC were reported by JMA at the parallel session of the WGM.
38. The Committee was informed that a new EEC dual-polarization X-band Doppler radar was installed in Macao, China at the end of 2009. It is expected to put into operation before the rainstorm and typhoon season of 2010.
39. The Committee was informed that RSS, e-Me (e-mails to registered users), and InfoMet (a software run on Microsoft Windows) were first open to internet users to obtain timely tropical cyclones and severe weather warnings. The Cooperation Arrangement between Macao Meteorological and Geophysical Bureau (SMG) and Zhuhai Meteorological Bureau of CMA was signed on 6 June 2009, highlighting meteorological data exchange and co-weather-briefing especially during the passage of tropical cyclones.
40. The Committee noted the efforts in Malaysia to improve the numerical weather and wave model with the help from other Members. Hardware upgrades are being done presently to the data storage system of the three operational numerical weather prediction systems at the Malaysian Meteorological Department.
41. The Committee was informed that KMA has developed a web-based satellite image analysis system in order to enforce the monitoring and analyzing functions of the tropical cyclone. It includes search function for past similar typhoon case, fixing the typhoon eye, estimating the typhoon intensity and gust radius and etc.
42. The Committee noted with pleasure that heavy rain and strong winds advisories and warnings are provided to various government agencies in Singapore to enhance their emergency preparedness. The warnings are also issued to the public via the media.
43. The Committee noted that Singapore undertook efforts to upgrade her systems and telecommunication links during 2009. The existing S-band Doppler weather radar is in the process of being replaced with a new Sband dual-polarization radar. The Message Switching System which handles the reception of information via Global Telecommunication System (GTS)/AFTN (including TC advisories etc) is being replaced with a new system to enhance its reliability and capability. The international links to RTH-Melbourne, RTH-Bangkok, NMC-Kuala Lumpur, NMC-Jakarta and NMC-Manila (as part of the GTS) are also in the process of being migrated from Frame Relay to MPLS.



44. The Committee noted with pleasure the improvements in the radar network, telemetering system, satellite receiving station, automatic weather station network, and Global Telecommunication Circuits system in Thailand. The Thai Meteorological Department (TMD) installed the IIT Storm Surge Model in 2009 to improve storm surge forecast.
45. The Committee was informed that RSMC Honolulu hosted Forecasters and Typhoon Duty Officers from the Naval Maritime Forecast Center (NMFC) and Joint Typhoon Warning Center (JTWC). The visits were to familiarize NMFC and JTWC staff with RSMC Honolulu operations and forecast software packages and to increase collaboration among the two agencies.
46. The Committee noted that RSMC Honolulu coordinated the deployment of Air Force Reserve WC-130 and NOAA Gulf Stream hurricane reconnaissance aircraft as Hurricane Felicia headed toward Hawaii. The flights provided crucial data which greatly assisted RSMC forecasters.
47. The Committee was pleased to see that, in Viet Nam, special arrangements are made with the national television channels to improve weather program and a link has been established from NCHMF to the office of Emergency Rescues for a quick dissemination of meteorological information (satellite images, observations, weather bulletins and TC warnings).
48. The Committee was informed of the advancement in Viet Nam in the application of satellite images and related techniques, numerical weather prediction techniques, and forecast software.
49. The Committee noted with pleasure that the Philippines achieved improvements in automatic weather station and radar networks. In the later part of the 3rd quarter, the Tropical Cyclone Module developed by Australia was installed to improve tropical cyclone forecast, that is capable of doing consensus forecasting to all the typhoon models over the northwest Pacific area.
50. The Committee was informed that Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA's) Special Tropical Weather Disturbance Reconnaissance, Information Dissemination and Damage Evaluation (STRIDE) was dispatched to assess and conduct field investigation and extend assistance in the mitigation of meteorological hazards and disaster reduction in areas affected by several tropical cyclones.
51. The Committee was informed that PAGASA-DOST now conducts press conferences/briefing every issuance of a Weather Bulletin and Warning four times a day, every 5AM, 11AM, 5PM and 11PM. Weather Forecasters/Meteorologist also joined the PAGASA IEC group as regular lecturers for the communities concerning hydro-meteorological hazards.
52. The Committee noted with pleasure that the web-based typhoon forum was successfully set up in July 2009 by Shanghai Typhoon Institute (STI) of CMA and open to nominated members. This forum is intended to provide a real time communication platform for forecaster and researcher of the Asia and Pacific Typhoon committee, improve the forecast ability of TC and reduce the damage of TC.
53. The Committee noted the proposal for launching a Typhoon Committee science and technology journal "Tropical Cyclone Review" on the initiative of WGM and agreed that the journal can be an effective forum for broad exchange of new knowledge of typhoon research and latest technology of typhoon forecast. The Committee noted with pleasure that CMA is willing to host the editorial board of the journal "Tropical Cyclone Review".
54. The Committee expressed its gratitude to Prof. Russel Elsberry, representative of World Weather Research Programme (WWRP)/WMO, who informed the Committee recent research progresses and activities in Tropical Meteorology Research Programme (TMRP).

55. The Committee was informed that KMA carried out a survey to investigate the members' status of GTS communication regarding the A/N to BUFR software dissemination plan that was agreed at the 40<sup>th</sup> Session of the Committee, and this project will be extended to end of 2010.
56. The Committee was informed that KMA began to issue 5-day typhoon forecast with track and intensity information in 2010 by experimental.
57. The Committee noted with pleasure that KMA signed a Memorandum of Understanding (MOU) with NHMS of Viet Nam on 7 December, 2009 which aims to strengthen cooperation to exchange scientific knowledge on Meteorology and Hydrology of National Services, research and human resources development, to conduct joint studies and coordination of exchange of scientists, knowledge, materials and publications, to share and exchange information on programs of work, project, activities and publications which bring mutual interest and benefits and to make suitable arrangement for representatives of KMA and NHMS of Viet Nam to meet regularly to review the progress of cooperation activities and to discuss future cooperation.
58. The Committee was informed that KMA operates 10 radar sites and continuously updates related facilities, and plans to establish the Korea-Radar Operation Center (K-ROC) in 2010
59. The Committee was informed that KMA has adopted the Unified Model (UM) as KMA's next operational numerical model with global 4DVAR data assimilation suite. The model results can be provided to typhoon forecasters and used to help them produce typhoon-related information in 2010. And the higher resolution UM N512L76 model starts to run at the 3<sup>rd</sup> supercomputer system from the last quarter of 2010 for the high accuracy weather forecasting.
60. The Committee was informed that KMA offered a course on Information and Communication Technologies (ICT) for Meteorological Services with support from the Korea International Cooperation Agency (KOICA), in Seoul on 24 May to 27 June, 2009. Total 13 participants from 12 countries including TC members were participated in this training course which was designed to improve the Information Technology (IT)-related job processing ability in meteorological services, and is used in WMO IT Programs.
61. The Committee was informed that KMA held the International Workshop on Tropical Cyclone-Ocean Interaction in the Northwest Pacific (TCOI 2009) in Jeju, Republic of Korea, from April 27 to April 29, 2009. During the workshop, typhoon researcher, forecaster and physical oceanographer from Australia, China, Japan, Taiwan and USA participated, and intensively discussed the research results about the typhoon-ocean interaction phenomena, observation data utilization method, numerical model-based forecasting.
62. The Committee was informed that KMA held the Workshop on the Economic and Social Effects of Typhoon in Jeju, Republic of Korea, from 21 to 22 August, 2009. The main theme was "Is typhoon always bad?" Over 50 experts from several fields such as economic and social sciences, engineering, journalism, and meteorology participated in presenting the typhoon-related disasters, social and economic effects in terms of negative and positive viewpoint.
63. The Committee was informed that CMA and KMA hosted the 2nd Joint Workshop on Tropical Cyclones in Shanghai, China, from 19-23 December, 2009. Total 26 papers were presented with subjects such as the typhoon-related disasters, climate and typhoon activity change, typhoon genesis, forecasting, and structure change. KMA and CMA agreed to have the third workshop in 2010 in Korea with more experts from other countries, and also to make efforts for the future cooperation in the typhoon research and forecast fields.

### **Conclusions of WGM:**

64. On the basis of the information provided by Members and findings of the integrated workshop in Cebu, Philippines in September 2009 as well as Parallel Session of WGM, the following conclusions were reached:
- a. Important progress was made by Members in the implementation of the TC Strategic Plan and annual operating plan under Meteorology Component during the past year.
  - b. Significant progress was made in the project entitled ‘Assessment of the impact of climate change on tropical cyclone frequency and intensity variation’.
  - c. There is a need to facilitate TIPS technology and knowledge transfer among Members.
  - d. The web-based typhoon forum is helpful in terms of providing a real time communication platform for forecaster and researcher of the TC community.
  - e. Development of communication system in the Committee area is satisfactory.
  - f. Exchange of radar data among Members is important in terms of improving QPE and QPF capability.
  - g. The assessment on 2008 T-PARC field experiment has provided important information in recognizing the necessity of observation especially designed for tropical cyclones.
  - h. New completion data for migration of SAREP and RADOB from A/N to BUFR and dissemination of the decoding/encoding software of BUFR would be the end of 2010.

### **Recommendations of WGM:**

65. On the basis of the information provided by Members and the outcomes of the WGM paralleled session and the integrated workshop in Cebu, Philippines in September, 2009, following recommendations were made:
- a. To confer the recognition letter to the expert team on the report on Assessment of Impacts of Climate Change on Tropical Cyclone frequency and intensity in the Typhoon Committee region.
  - b. To form an expert team to continue the assessment on the impact of Climate Change with the focus on the tropical cyclone track and impact area. Recommended members include James C. Weyman (USA), Dr Woo Jin Lee, (KMA), Ying Ming (CMA), Tetsuo Nakazawa (JMA), Tsz Cheung Lee (HKO), with Leong Weng Kun (Macao, China) as coordinator, and to confer the letter of appointment by Committee to the expert team.
  - c. To pay attention to the progress that has been made by the Expert Panel on Tropical Cyclones and Climate Change. It should also be noted that there will be a new statement before the opening of IWTC-VII.
  - d. To further develop the project “Typhoon Information Processing Systems (TIPS)” considering its importance in promoting the exchange of experiences among Members and improving TC forecast tools of all the Members.
  - e. To further improve quantitative precipitation estimation (QPE) and quantitative precipitation forecast (QPF) techniques of Members.
  - f. To produce the storm surge distribution map and report the evaluation in 43rd session.
  - g. To facilitate the exchange of radar data among neighboring Members.

- h. To enhance the interaction among WGM, WGH and WGDPP by promoting the project on urban flood risk management.
- i. To facilitate Members' active participation in the WMO Landfall Typhoon Forecast Demonstration Project so as to promote the implementation of the most advanced forecasting techniques for landfalling typhoon.
- j. To continue the effort in improving the web-based forum.
- k. To request Members concerned to take the necessary action to use SAREP and RADOB in BUFR by the end of 2010 with software assistance by the Republic of Korea if necessary, and to request the RSMC Tokyo to continue to disseminate both BUFR and alphanumeric SAREP and RADOB to the end of 2010.
- l. To request WGM and CMA to prepare for launching the Committee science and technology journal "Tropical Cyclone Review", and to request TCS to apply its international ISSNs (including print and online).
- m. To reappoint Mr. Kiichi Sasaki (Japan) as the TOM Rapporteur.
- n. To request WMO to publish as early as possible the 2010 edition of TOM as submitted by the Rapporteur, with the amendments given in Appendix VII.
- o. To request WMO to upload the updated TOM on the Tropical Cyclone Programme (TCP) Website and distribute the 2010 edition in CD ROM format to Members by March 2010.
- p. To re-appoint Mr. Lei Xiaotu (China) as Chair of WGM, Mr. Nguyen Dai Khanh (Viet Nam) and Mr. Nathaniel Cruz (the Philippines) as Vice-Chairs of WGM.

**(b) Hydrological Component (agenda item 5.2)**

- 66. The Committee took note of the outcome of the parallel session of the WGH which met on Monday, 25 January 2010 in Appendix VIII.
- 67. The Committee reviewed the activities of the Members related to the implementation of the TC Strategic Plan and its annual operating plan for the hydrological component during the past year. Details can be found in the Appendix IX.
- 68. The Committee was informed that WGH completed two projects in 2009 with another five projects continuing in 2010.
- 69. The Committee was informed on the progress and future activities of the projects: (1) Urban Flood Risk Management (UFRM), led by China; (2) Assessment System of Socio-economic Impacts of Water-related Disasters for Infrastructure, led by RoK; (3) Hazard Mapping for Sediment Disasters, led by Japan ;(4) Establishment of Flood Disaster Preparedness Indices, led by Japan and (5) On-the-Job Training on Flood Forecasting between Members, led by Malaysia.
- 70. The Committee noted that UFRM is a very important and meaningful cross cutting project in TC and it was proposed that AWG be given the responsibility of managing this project.
- 71. The Committee also noted with appreciation that the ICT and DRR Division of ESCAP expressed its willingness to explore the possibility to: (1) organize a meeting on UFRM in July or August 2010; (2) push forward this crosscutting project by contracting consultants and (3) contact donors for resources mobilization.
- 72. The Committee noted that the National Institute for Land and Infrastructure Management (NILIM) and SABO Technical Center take consideration to seek the possibility of organize training course on sediment disaster prediction and warning for Members in future years.

73. The Committee noted with appreciation that the River Bureau and the NILIM of MLIT, the Public Works Research Institute (PWRI) and Japan International Cooperation Agency (JICA) jointly conducted JICA Comprehensive Management of Rivers and Dams, which began in 1973, including participants from Members.
74. The Committee noted with appreciation that the International Centre for Water Hazard and Risk Management (ICHARM) established a new training course on disaster management plans combined with flood hazard maps and flood forecasting/warning systems in November 2009 in collaboration with JICA which involved some Members.
75. The Committee also noted with appreciation that International Flood Network (IFNet) (supported by IDI) and ICHARM ran the International Workshop on Application and Validation of Global Flood Alert System (GFAS) from August 3 to 7, 2009.
76. The Committee was informed that on 17 – 19 February 2009, the Philippines hosted the East and Southeast Asia Regional Flood Hazard Mapping Seminar. The seminar was sponsored by ICHARM, PWRI, JICA in coordination with the Government of the Philippines.
77. The Committee noted that the progress of related WMO activities being implemented under the WMO Flood Forecasting Initiative; the Associated Programme on Flood Management (APFM); and the World Hydrological Cycle Observation System (WHYCOS). The Flash Flood Guidance System is being implemented in the Mekong River Basin, with potential of other sub-regions in Asia to follow. Under the APFM, the HelpDesk has become operational (<http://www.FloodManagement.info>) with functions of materials and practical tools as well as advisory services for flood management.
78. The Committee noted the importance of the assessment on the impacts of extreme climate events will look into how the water resources sector will address the issues on climate variability and climate change to come up with appropriate coping mechanisms for water supply, dam operation, irrigation and the power sector, among others.
79. The Committee noted with appreciation that the Ministry of Land, Transportation and Maritime Affairs (MLTM), Republic of Korea, showed strong intention to support UFRM Project through providing and sharing his experiences.
80. The Committee noted the importance to promote TC's visibility in the world by taking part in the events of the preparatory meeting of the Asia Pacific Minister Meeting will be held in Singapore in June, 2010.
81. The Committee was informed that WGH Chair has requested that China, in coordination with RoK, Japan and WGM, draft a proposal to enhance the flood forecasting and warning system using advanced radar observations.
82. The Committee also expressed its appreciation to WMO for supporting two publications in 2009.
83. The Committee noted with appreciation that technical help desks on Flood Hazard Maps and Debris flow and landslides warning system with continuous technical consultation for TC Members are available in the website of ICHARM and Sabo Technical Center.
84. The Committee was pleased to be noted that successful achievement has been observed for the OJT in Malaysia. The Committee requested Malaysian Government to be considered to extend 4th OJT in 2010.
85. The Committee noted with pleasure the cooperation between China and TCS in hosting the training course on operational Flood Forecasting System and its application for TMD.

## **Conclusions of WGH:**

86. On the basis of the information provided by Members and the outcomes of the Committee and integrated workshop in September 2009, the following conclusions were reached:
- a. That successful finalization of the two projects was an important accomplishment of WGH. The Committee deeply expressed its appreciation to MLIT of Japan for producing final report, providing series of manuals and quality of trainings.
    - Produce and use Flood Hazard Maps (FHMs)
    - Establish debris flow and landslides warning system
  - b. The Committee expressed its appreciation to the MLTM of RoK and MLIT of Japan for providing financial support to participants to the Integrated Workshop in Cebu in September, 2009. The MLTM of RoK and MLIT of Japan will consider continuing funding support to hydrological participants in the next TC Integrated Workshop in 2010 and the field training of Hazard Mapping of Sediment Disaster prior to the Workshop.
  - c. The Committee noted that WGH should have important role for implementing UFRM project, and recognized necessity of setting up collaboration group on this project and support the consultation activities in coordination with ESCAP. The Committee also noted that as kick-off activity, the comparison of countermeasure of UFRM among China, Japan and RoK through consultation with 3WGs Focal Points of each Member.
  - d. The Committee also recognized the importance of collaboration with APWF activities in terms of Water Disaster Management and Climate Change Adaptation which have known as Knowledge Hubs.
  - e. That further close collaboration with the WMO RA II Working Group on Hydrological Forecasts and Assessments in several themes of common interest and potential for cooperation provides significant benefits to the Committee.

## **Recommendations of WGH:**

87. On the basis of the information provided by Members and the outcomes of the WGH parallel session and integrated workshop in Cebu in September 2009, the WGH made the following recommendations:
- a. To re-appoint Mr. Toshio Okazumi, Japan as WGH Chair and Dr. Hong IIPyo, Republic of Korea and Mr. Liu Zhiyu, People's Republic of China as Vice Chairs of WGH.
  - b. To set up a special Task Force for Coordination Body to manage the implementation of the cross cutting project of UFRM in order to coordinate its implementation efficiently.
  - c. To built strong linkage with ESCAP and WMO to push forward the UFRM project.
  - d. To consult with ICT and DRR Division of ESCAP regarding the possibility to organize a meeting in July or August 2010 to be funded by ESCAP to discuss the UFRM project and the possibility of contracting consultants by ESCAP to push forward this cross cutting project.
  - e. To set up the channel of connection and communication with support base of UFRM project, such as ESCAP, WMO, ISDR, WB, ADB, ICHARM, JICA, etc.

### **(c) Disaster Prevention and Preparedness Component (agenda item 5.3)**

88. The Committee took note of the report of the Parallel Session of the WGDPP, details of which are presented in Appendix X. Activities of the Members can be found in the Appendix XI.

89. The Committee was informed of the activities of the WGDPP component as follows:
- a. WEB-GIS based Typhoon Committee Disaster Information System (WGTCDIS) project.
  - b. 4<sup>th</sup> Inter-Sessional WGDPP Workshop in Seoul, Republic of Korea during 28-29 April 2009
  - c. Expert Missions conducted in Viet Nam from 12 to 19 May 2009.
  - d. Integrated Workshop on 14-18 September 2009 in Cebu, Philippines.
  - e. Publication of the report on WGTCDIS.
90. The Committee was informed that twenty four representatives from Members and international organizations attended the 4<sup>th</sup> Inter-Sessional WGDPP Workshop held in Seoul in 28-29 April 2009. During the workshop the group finalized the design of WGTCDIS and agreed to provide inputs to the WGTCDIS by early September. The participants also discussed vision and future activities of WGTCDIS details of which are presented in Attachment I to Appendix X.
91. The Committee was informed that ESCAP organized the First session of the Committee on Disaster Risk Reduction (CDRR) in Bangkok from 25 to 27 March 2009. The CDRR was established to serve as the regional forum for discussions and the building of consensus on disaster risk reduction in Asia-Pacific region.
92. The Committee was informed that ESCAP would launch a publication - Asia-Pacific Disaster Report - focusing on good practices, trends and major events, economic and social analysis of the impacts of disasters, regional cooperation, among others. In that connection, the TC study on the Typhoon trend in conjunction with climate change would provide background information for the Asia-Pacific Disaster Report.
93. The Committee noted two new DRR-related initiatives by ESCAP: the Asia-Pacific “gateway” on disaster risk reduction and development for information sharing and analysis, and the regional cooperative mechanisms for drought risk reduction in Asia-Pacific.

#### **Conclusions of WGDPP:**

94. On the basis of the information provided by the Members and findings of the parallel session on WGDPP, the following conclusions were reached:
- a. The WGDPP recognized the importance of the outcomes of the Integrated Workshop on urban flood management considering climate change, as the basis for future activities on WGTCDIS.
  - b. The expert mission to Viet Nam successfully transferred the WGTCDIS which provides an improved capability for early warning and disaster management.
  - c. The 4<sup>th</sup> Inter-Sessional WGDPP Workshop successfully identified WGDPP activities for further extension of WGTCDIS.
  - d. There is a need to collect typhoon related disaster information for development of a brochure and to report regularly through the WGTCDIS.

#### **Recommendations of WGDPP:**

95. On the basis of the information provided by the Members and deliberations, the WGDPP made the following recommendations:

- a. To appoint Dr. Waon-Ho Yi from the National Institute for Disaster Prevention; the National Emergency Management Agency of the Republic of Korea and Mrs. Hilda Lam from Hong Kong Observatory, Hong Kong, China as Chair and Vice Chair of the WGDPP respectively.
- b. To enhance the ongoing project on WGTCDIS to serve as a portal for TC Members on DPP matters.
- c. To extend WGTCDIS for Multi-Hazard Early Warning Systems in conjunction with other WGs to make a link with the WGTCDIS.
- d. To change the name of WGDPP to Working Group on Disaster Risk Reduction (WGDRR) in order to enhance TC's cooperation with the United Nations organizations specially WMO and reduce confusion by using different name.
- e. To support the publications of typhoon brochure of TC Members and the organization of public education events to raise public awareness on DRR jointly with WMO DRR Program and UN/ISDR, as well as WGM and WGH.
- f. To conduct a training workshop on the urban flood management considering climate changes during the IWS in 2010.
- g. To carry out trials involving more Members, as a result of success with Macao, China and Guam, USA for the real time transmission of severe warning using SWIC.
- h. To implement a pilot project of community weather stations to raise public awareness on climate change.
- i. To increase interaction among WGM, WGH, and WGDPP members to extend and operate WGTCDIS effectively.

**(d) Training and Research Coordination Group (agenda item 5.4)**

96. The Committee took note of the report given in Appendix XII prepared by the Chair of Training and Research Coordination Group (TRCG), in particular the recommendations made in the 1<sup>st</sup> TRCG Planning Meeting in Jeju, RoK and the effort made by TRCG in drafting a purposely planned 4-year work programme with continuity and sustainable development.
97. The Committee thanked KMA for hosting the 1<sup>st</sup> TRCG Technical Forum and Planning Meeting, jointly organized by TRCG and WGM, in Jeju, RoK in May 2009. The Committee also appreciated the support provided by WMO TCP in setting up the resource persons for the technical lectures. The success of the event was testified by the favorable feedback received from both the lecturers and participants through a post-event survey.
98. The Committee expressed its appreciation to CMA and WMO Nanjing Regional Training Center (RTC) for hosting the Roving Seminar in Nanjing University of Information Science and Technology in November 2009, and to WMO Public Weather Services Programme (PWSP) for actively supporting the event in providing the resource person for media skill training.
99. The Committee thanked China and Hong Kong, China for hosting research fellowship programmes in 2009.
100. The Committee took note of the successful training attachment of women forecasters from China and Malaysia to RSMC Tokyo in July 2009, and thanked JMA and WMO TCP for continuously supporting this capacity-building initiative.

**CONCLUSIONS of TRCG:**

101. The draft 4-year work plan formulated in the 1<sup>st</sup> TRCG Planning Meeting continued to provide a sound basis for implementing training and research activities of TC.



102. There is a need to continue to work closely with other working groups when implementing the research and training initiatives in the proposed 4-year work plan.

**RECOMMENDATIONS of TRCG:**

103. On the basis of the conclusions reached by the deliberation of Members, the Committee made the following recommendations:
- a. to re-establish TRCG with the re-appointment of Mr. Edwin S.T. Lai (Hong Kong, China) and Mr. Mitsuru Ueno (Japan) as Chair and Vice Chair of TRCG, respectively.
  - b. to request Members to confirm their respective focal points as members of TRCG, and to update the list of resource persons as appropriate.
  - c. to request Members to release nominated TRCG members to travel to future TRCG-related meetings/activities as far as possible so that good continuity in TRCG work can be maintained.
  - d. to request Members to offer or take part in research fellowship projects focusing on TIPS, EPS and consensus forecasts; and
  - e. to endorse the proposed TRCG AOP for 2010, including the organization of a roving seminar under the support of Typhoon Committee Trust Fund, with Thailand tentatively offering to host the seminar in 2010.

**(e) Activities of AWG (agenda item 5.5)**

104. Reported in Agenda item 8.

**(f) Activities of Resource Mobilization Group (agenda item 5.6)**

105. The Committee was informed that the Report of the Activities of RMG was not submitted in time to be presented during the Session.

**(g) Activities of Typhoon Committee Secretariat (agenda item 5.7)**

106. The Committee took note of the report given in Appendix XIII prepared by the Secretary of the Typhoon Committee.
107. The Committee thanked the Government of Macao, China for its continued support to provide headquarters and endowment fund for TCS operation and also for providing temporary facilities during the restoration of TCS headquarters which were seriously affected by the Typhoon Hagupit.
108. The Committee expressed its appreciation to Government of Macao, China for secondment of a meteorologist and its offer to continue that secondment until the end of the second four-year period that the TCS will remain in Macao, China.
109. The Committee expressed its appreciation to People's Republic of China for secondment of a hydrologist to TCS and encourages continued support for this position, until the end of the second four-year period that the TCS will remain in Macao, China.
110. The Committee thanked TCS for its efforts in support of the Committee.
111. The Committee expressed appreciation for the kind offer from the Philippines Typhoon Committee Foundation Inc., of providing financial support for Dr. Roman L. Kintanar Award in 2009 and beyond.

## **VI. REVIEW OF THE 2009 TYPHOON SEASON AND PUBLICATIONS (agenda item 6)**

112. The Committee noted that over the western North Pacific and the South China Sea, 22 named tropical cyclones (TCs) formed in 2009, 13 of which reached typhoon intensity. This total is less than the 30-year average frequency of 26.7. Although the formation of the first named TC in 2009 was relatively late, the number of formation (21) from May to October was almost the same as the 30-year average frequency of 21.3. Only one TC formed from November, which is slightly less than the 30-year average frequency of 3.7.
113. From May to July, convective activity was enhanced around the Philippines and over the South China Sea. Six named TCs formed there. Kujira (0901) and Chan-hom (0902) moved northeastward and caused damage to the Philippines, while the others moved westward and hit southern China.
114. Of six named TCs forming east of longitude 135 degrees east from August to September, five moved northward over the sea south or southeast of Japan except Parma (0917) due to weaker expansion of North Pacific High to Japan. Etau (0909) and Melor (0918) affected Japan, while Parma (0917) caused damage to the Philippines. Another six named TCs formed west of longitude 135 degrees east during this period. Morakot (0908) damaged China and the Philippines, and Ketsana (0916) affected Lao, the Philippines and Viet Nam.
115. All three named TCs in October formed east of longitude 140 degrees east, where convective activities were more enhanced than usual. Mirinae (0921) moved westward and hit the Philippines and Viet Nam, causing damage to these countries. From November, only one named TC formed due to inactive convection east of the Philippines and over the South China Sea.
116. The mean formation latitude and longitude of the genesis point of the 22 named TCs in 2009 were 16.1°N and 132.3°E – almost the same as the 30-year average values (16.2°N and 136.9°E).
117. The Committee took note with appreciation the review of the 2009 typhoon season provided by the RSMC Tokyo-Typhoon Center as given in Appendix XIV.

### **Publications**

118. Committee took note that the TCS published the 21<sup>st</sup> issue of the Typhoon Committee Newsletter in January 2009 and the 2008 Typhoon Committee Annual Review (TCAR) in January 2010 disseminated to the Members, ESCAP and WMO in electronic (CD-ROM) format. The Committee appointed the Typhoon Committee Secretary as the Chief Editor.
119. The Committee noted with appreciation that the RSMC Tokyo – Typhoon Center published the “Technical Review No.11” in March 2009 and the “Annual Report on the Activities of the RSMC Tokyo – Typhoon Center in 2008” in December 2009. These are available on the Web page of JMA/RSMC Tokyo at <http://www.jma.go.jp/jma/jma-eng/jma-center/rsmc-hp-pub-eg/annualreport.html>.

## **VII. COORDINATION WITH OTHER ACTIVITIES OF THE WMO TROPICAL CYCLONE PROGRAMME (agenda item 7)**

120. The Committee was informed by the WMO Secretariat that the Executive Council, at its 61st session in June 2009, gave following guidance to the Tropical Cyclone Programme (TCP):
  - a. To give high priority to the organization of training workshops for the best use of ensemble-based products.
  - b. To enhance the support measures for operational forecasters through update of the Global Guide to Tropical Cyclone Forecasting and development of the Tropical Cyclone Forecaster’s Website.

- c. To promote the transfer from R&D to operational use through interactions between researchers and operational forecasters such the seventh International Workshop on Tropical Cyclones (IWTC-VII; La Reunion,15-20 November 2010).
  - d. To give high priority to development of the Storm Surge Watch Schemes with emphasis on capacity-building.
121. The Committee was pleased to note that TCP, in collaboration with World Weather Research Programme (WWRP) and Public Weather Services (PWS) Programme, has formulated “Landfall Typhoon Forecast Demonstration Project” on the initiative of Shanghai Meteorological Bureau. This project is one of the major outcomes of the second International Workshop on Tropical Cyclone Landfall Processes (IWTCLP-II) held in Shanghai, China, in October 2009. It aims to demonstrate the performance of the most advanced forecasting techniques for landfalling typhoons and is expected to achieve development of techniques for evaluation & assessment of landfall forecast as well the forecast of landfalling typhoon including associated heavy rain. The project is targeted at the East China on it first phase for 2010-2012.
  122. North Western Pacific Tropical Cyclones Ensemble Track Forecast Experiment is a 5-year WWRP’ Research Demonstration Project (RDP) and another outcome of WTCLP-II. The main objective of this project is to demonstrate the effectiveness of the THORPEX Interactive Grand Global Ensemble (TIGGE) data to the operational typhoon forecasting. TIGGE typhoon track data will be provided to the Typhoon Committee Members on a real-time basis via a password protected web site which will be established in May 2010. Training for operational forecasters and evaluation of the utility of such data in operational forecast are also planned to be conducted under the project. Members were encouraged to exploit the use of the TIGGE data for their operational forecast of typhoons.
  123. The Committee was informed that the 6th TC RSMC/TCWC Technical Coordination Meeting was held in Brisbane, Australia in November 2009, which covered a broad range of subjects to improve the coordination in operational and technical aspects of the tropical cyclone warning services across the basins. It took note in particular that the WMO Wind Averaging Study to provide a technical guideline for wind averaging conversion factors was completed and the final report was adopted. It noted with pleasure that the report will soon be published by WMO/TCP and its summary will be included in the operational plans/manual of the tropical cyclone regional bodies. TCP also plans to incorporate the report in a new version of the “Global Guide to Tropical Cyclone Forecasting” and the “Tropical Cyclone Forecasters’ Website”.
  124. The Committee noted that a new initiative building on a regional cooperation model and involving WMO, World Bank, ISDR and UNDP in the South East Asia has been launched by WMO Disaster Risk Reduction (DRR) Programme. Its goal is to develop end-to-end early warning system capacities of National Meteorological & Hydrological Services (NMHSs). The first step of the initiative started in July 2009 to conduct fact-finding missions in all the five countries (Cambodia, Indonesia, Lao People’s Democratic Republic, Philippines and Vietnam) for (i) detailed analysis of the capacities, gaps and needs of the NMHSs in supporting disaster risk management and early warning systems and (ii) evaluation of the needs and requirements of disaster risk management agencies and stakeholders for the NMHS products and services. The second step will be a regional meeting of all the involved countries and partners (2<sup>nd</sup> half of 2010) to review the results of the assessment missions and develop a road map to implement the projects in the selected countries.
  125. Prof. R. Elsberry presented a summary of the CAS/WWRP Working Group on Tropical Meteorology Research (WGTMR) activities, and especially those activities in cooperation with the WWW/TCP. He encouraged the Committee to identify as early as possible forecasters and hydrologists to attend IWTC-VII, and that individual Members also support the attendance of other forecasters and researchers. The Committee was also informed that tropical cyclone field experiments during 2010, and especially the Interacting Typhoon-Ocean Program (ITOP) and Tropical Cyclone Structure (TCS-10) will be carried out in the western North Pacific during August to October 2010. He emphasized that the atmospheric

observations as well as numerical model fields will be freely available to researchers via the ITOP/TCS-10 archive.

126. Prof. Elsberry reviewed the activities of the WGTMR Expert Team on Tropical Cyclones and Climate Change. An assessment of the present understanding on this controversial topic is to be published in Nature Geosciences early in 2010 and a new Statement on Tropical Cyclones and Climate Change for the guidance of NMHSs will be issued in 2010. He acknowledged the TCP in the organization and provision of support for forecasters to attend IWTCLP-II. These forecasters provided key reports on the landfall impacts of tropical cyclones.

#### **VIII. PROGRAMME FOR 2010 AND BEYOND (agenda item 8)**

127. The Committee noted with pleasure the attendance and participation of the representative of Indonesia and encourages continuing participation as well as membership in the Committee.
128. The Committee noted the submission of TCS on the proposal for Memorandum of Understanding (MoU) between World Meteorological Organization and Typhoon Committee Secretariat referring to TCTF Arrangement and the proposal to implement the future Typhoon Committee publications under TC logo (Appendix XV and XVI, respectively).
129. The Committee noted requests from the Members to replace the names of the Tropical Cyclones MORAKOT, KETSANA and PARMA.
130. The Committee noted with appreciation the offer of Macao, China to host the Integrated Workshop in 2010. The date will be coordinated through the TCS and announced by March 2010. Suggested themes for consideration: *Urban Flood Management*, *Climate Change and TC Activities*, and *Benefits of Typhoons*.

#### **Advisory Working Group (AWG)**

131. The Committee was informed of the activities of the AWG in 2009.
  - a. AWG Members attend Integrated Workshop on “Building Sustainability in High Risk Areas of the Typhoon Committee” in Cebu, Philippines, 17-18 September 2009.
  - b. Conducted a Small Meeting of Working Group Chairs in Macao, China, 16-17 December 2009.
132. The Committee noted with pleasure, the progress of the AWG in coordination with all of the TC Members and expressed its appreciation to the AWG for its excellent efforts as reported in Appendices XVII through XVIII to XIX.
133. The Committee noted important continue progress since the introduction of strategic planning and management approach to the regional cooperation program of the Committee and the instrumental role of the AWG, ESCAP, WMO and TCS in the establishment of a firm foundation for goal-oriented performance. In this context, it is important that the Committee continues to benefit from the assistance and support of ESCAP and WMO as well as enhanced roles of TCS.
134. The Committee was informed of the status of the 2009 Typhoon Committee Annual Operating Plan (AOP), the proposed Annual Operating Plan for 2010 and the budget for 2010.
135. The Committee also noted with pleasure, the accomplishments of the WGs towards completion of Strategic Goals (SGs) in the Strategic Plan 2007-2011.
136. The Committee expressed its sincere appreciation to the AWG Chair, Vice-Chair, and AWG members for their work in formulating and coordinating the 2010 Annual Operating Plan and 2010 budget.

## Recommendations of AWG

137. The AWG proposed the following recommendations:
- a. Incorporate a statement on climate change into the “Introduction” portion of the Strategic Plan, in accordance in Appendix XX.
  - b. Collaborate, together with the WMO/ESCAP Panel on Tropical Cyclones, in the elaboration of the chapter I of the ESCAP Asia-Pacific Disaster Report.
  - c. Members approve increasing the annual budget ceiling from US \$100,000 to US \$120,000.
  - d. Members approve the proposed 2010 Budget as presented in Appendix XXI.
  - e. Acknowledge that the AWG will continue to support the Resource Mobilization Group and evaluate its current layout.
  - f. Continue to conduct Small AWG Meetings.
  - g. Produce a one-page report after every Typhoon Committee sponsored workshop.
  - h. Create a presentation template for the Members oral reports and limit reports to 15-20 minutes.
  - i. Review the Strategic Plan at the IWS and be prepared to finalize draft at the Small Group Meeting in December 2010. Propose any modifications to the Forty Third Session for consideration.
  - j. Re-establish Mr. James Weyman as the Vice-Chair and Ms. Genevieve C. Miller as the Secretary of the AWG.

## **IX. SUPPORT REQUIRED FOR THE COMMITTEE’S PROGRAMME (agenda item 9)**

### **(a) Technical Cooperation**

138. The Committee was informed of the technical cooperation activities of WMO and ESCAP in support of the programmes of the Typhoon Committee carried out in 2009, including the WMO Voluntary Cooperation Programme (VCP), Emergency Assistance Fund scheme and Technical Cooperation among Developing Countries (TCDC) activities, and expressed its appreciation to WMO, ESCAP and collaborating partners for providing assistance to Members of the Typhoon Committee.
139. It also noted that, in 2009, China; Japan; and the Republic of Korea continued to provide cash contributions to the VCP(F), and China; Hong Kong, China; Japan; the Republic of Korea; and the USA provided equipment, expert services and fellowships. The VCP(F) support was provided to support Cambodia’s participation in the 42<sup>nd</sup> session of the Committee. WMO is prepared to continue support to the LDCs to participate in the future Committee sessions. The Committee welcomed the offer of China for the upgrade of VCP- or bilaterally-supported FengYunCast receiving systems for 14 countries including six Members of the Committee. The Committee was also informed that bilateral assistance is being provided by Japan to Lao PDR to improve meteorological services.
140. Within the framework of the TCDC, China organized the WMO Symposium on Meteorological Services in support of Decision-making followed by the 2009 Study Tour in China from 13 to 22 October 2009 for 22 participants from 16 Members of WMO. The 2010 China Study Tour is planned for May 2010 to coincide with the opening of the MeteoWorld Pavilion in Shanghai Expo 2010.
141. The Committee further noted the recent emergency assistance provided under the Emergency Assistance Fund scheme to WMO Members affected by natural disasters, including DPRK, Myanmar and Pakistan, and a new request from Lao PDR for the

restoration of damaged meteorological instruments and equipment at synoptic stations following TY Ketsana. Affected Members who need emergency assistance were advised to utilize this scheme, and all Members were requested to consider possible support to the affected NMHSs. With reference to the WMO assistance provided for short-term requirements of Myanmar, the TC Members were invited to give consideration of possible support, as appropriate, for key findings and recommendations of the WMO fact-finding mission in February 2009 concerning the medium- to long-term requirements.

142. In this regard, the Committee was informed that the ESCAP Tsunami Regional Trust Fund, established in late 2005 with contribution of US \$12.6 million for effective regional early warning systems for tsunamis, has expanded its scope in 2009 to include other hazards and climate preparedness. ESCAP also facilitated technical advisory services on disaster risk reduction to be provided upon request by Members. The TC Members were encouraged to utilize the above resource mechanisms to support the Committee's Programme.
143. The Committee noted with appreciation the offer of Macao, China to continue hosting the Secretariat for 4 more years from 2011 to 2014.
144. The Committee was informed that the Agreement between Macao, China and TC need to be reviewed.

**(b) Typhoon Committee Trust Fund (TCTF)**

145. The Committee reviewed the statement of account of TCTF for the period of 1 January to 31 December 2008 and the provisional statement for 1 January to 31 December 2009 submitted by the representative of the WMO Secretariat as shown in Appendix XXII.
146. The Committee was informed that some Members contributions were not included in the provisional statement for 2009, owing to the complex accounting procedures.

**X. DATE AND PLACE OF THE FORTY-THIRD SESSION (agenda item 10)**

147. The Committee noted with appreciation the offer of RoK in hosting the Forty Third Session in January 2011 in Jeju, RoK. The date will be coordinated through the TCS and announced by March 2010.

**XI. SCIENTIFIC LECTURES (agenda item 11)**

148. The scientific lectures were presented as shown in Appendix XXIII. The Committee expressed its appreciation to all the lecturers and requested the TCS to disseminate all the lecture papers/PowerPoint presentation and to include them in the Typhoon Committee Annual Review for 2009.

**XII. ADOPTION OF THE REPORT (agenda item 12)**

149. The Committee adopted the report of the session at 11:15 am 29 January 2010.

**XIII. CLOSURE OF THE SESSION**

150. The delegates from the Members of the Typhoon Committee, representatives of ESCAP, WMO and TCS and observers expressed their thanks and appreciation to the National Environment Agency, Meteorological Services of Singapore for the successful hosting of the Forty Second session of the Typhoon Committee. They also expressed gratitude to Mr. Foong Chee Leong, Director General of Meteorological Services and his staff for the warm hospitality and excellent arrangements made and also for organizing a tour through the beautiful sites of Singapore.
151. The Session was closed by the Chairman at 11:40 am, 29 January 2010.