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## **Economic and Social Commission for Asia and the Pacific**

### **Sixty-seventh session**

Bangkok, 19-25 May 2011

Item 3(f) of the provisional agenda

**Review of issues pertinent to the subsidiary structure  
of the Commission, including the work of the ESCAP  
regional institutions: Disaster risk reduction**

### **Report of the Typhoon Committee\***

#### **Note by the secretariat**

The secretariat transmits to the Commission an executive summary of the report of the ESCAP/WMO Typhoon Committee on its forty-third session, held in Jeju, Republic of Korea, from 17 to 22 January 2011.

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\* The report is reproduced in its original language, which is English. Any queries concerning the report should be directed to the secretariat of the Typhoon Committee.

## **Introduction**

The ESCAP/WMO Typhoon Committee (TC) is an inter-governmental body organized under the joint auspices of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the World Meteorological Organization (WMO) in 1968 in order to promote and coordinate the planning and implementation of measures required for minimizing the loss of life and material damage caused by typhoons in Asia and the Pacific. The TC develops activities under three substantive components: meteorology, hydrology, and disaster risk reduction, as well as in areas of training and research.

The Forty-third Session of the ESCAP/WMO Typhoon Committee, held in Jeju, Republic of Korea, from 17 to 22 January 2011, was attended by 95 participants from 11 out of 14 Members of the Typhoon Committee, namely: 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).

The Session was also attended by observers from Russia – Institute of Experimental Meteorology, Scientific & Production Association “Typhoon”; from the Asian Disaster Reduction Center; from Thailand – Regional Integrated Multi-Hazard Early Warning System; from the Indonesia – Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) and representatives from the Economic and Social Commission for Asia and the Pacific (ESCAP), the World Meteorological Organization (WMO) and Typhoon Committee Secretariat (TCS).

## **I. Summary of the decisions of the Committee**

The Committee at its forty-third session decided to:

1. Approve the reappointment of the TC Secretary, Mr. Olavo Rasquinho for the four-year period from 2011 to 2014.
2. Approve the proposed changes to the Dr. Roman L. Kintanar Award selection procedures presented by the AWG.
3. Accept the replacement of the tropical cyclone names KETSANA, MORAKOT and PARMA by CHAMPI, ATSANI and IN-FA, respectively.
4. Request Guam, USA to submit in the next Session the replacement of the tropical cyclone name for FANAPI in accordance with the Committee procedures.
5. Approve the TC Annual Operating Plan 2011 submitted by Advisory Working Group (AWG).
6. Approve the 2011 Budget totaling US\$134,000, including US\$14,000 from carry-over.
7. Request the senior representative of the Singapore Meteorological Agency to fill the role as chair of the AWG with the retirement of Singapore Director General.

8. Endorse the action of the 40<sup>th</sup> Session to appoint Ms Genevieve Miller, currently Secretary of AWG, as the new Vice Chair of the AWG as Mr. James Weyman leaves the position.

### **Meteorological Component**

9. Re-appoint Mr. Lei Xiaotu (China) as Chair of Working Group on Meteorology (WGM); to appoint Mr. Nathaniel Servando (Philippines) and Ms. Che Gayah ISMAIL (Malaysia) as Vice-Chairs of WGM.

10. Continue the assessment process on tropical cyclone activity (track and scope) and climate change with recommended members including Ying Ming (Shanghai Typhoon Institute - STI/CMA) as the team leader, Tsz-Cheung LEE (HKO), Hirotaka KAMAHORI (Meteorological Research Institute of Japan Meteorological Agency -MRI/JMA), Tom KNUTSON (Geophysical Fluid Dynamics Laboratory-GFDL/NOAA), Chunho CHO (CRD/NIMR/KMA), with LEONG Weng Kun (Macao, China) as coordinator, and to confer the letter of appointment by Typhoon Committee after the 43rd Session.

11. Hold a workshop on storm surge in cooperation with WMO for Urban Flood Risk Management (UFRM).

12. Request Regional Specialized Meteorological Centre (RSMC) Tokyo to conduct training on the storm surge model for UFRM during the annual TC attachment training, to produce storm surge distribution maps in 2011, to develop time-series charts of storm surges and report the evaluation in 44<sup>th</sup> session, and request Members to provide tidal and bathymetric data archive to RSMC Tokyo for verification of the time-series charts.

13. Further improve quantitative precipitation estimation/quantitative precipitation forecasting (QPE/QPF) techniques of TC Members and to request RSMC Tokyo to have QPE/QPF trainings during the annual TC attachment training and conduct an one day QPE/QPF workshop in conjunction with 6th Integrated Workshop (IWS) to be held in Nha Trang, Viet Nam on November 7-11, 2011, with the participation of the three working groups (WGs), and to publish the QPE/QPF techniques in the RSMC Tokyo Technical Review.

14. Further develop the project on Typhoon Information Processing System (TIPS) considering its importance in promoting the exchange of experiences among Members and improving TC forecast technique of all the Members.

15. Upgrade the super-ensemble forecast system on tropical cyclone (North-western Pacific Tropical Cyclone Ensemble Forecast Project - NWP-TCEFP), including operational test, verification and evaluation.

16. Further improve the effectiveness of the on-line typhoon forum and to share additional real-time observation, forecast and warning information by Members using the forum.

17. Develop the regional radar network through establishment of composite maps project with the collaboration with radar experts.

18. Promote the application of achievements of the Typhoon Landfall Forecast Demonstration Project (TLFDP) among Members, and upgrade the verification system by expanding the evaluating techniques.
19. Establish the editorial committee and office to publish a science and technology journal (Tropical Cyclone Research and Review) for the Committee and request TCS to apply for an International Standard Serial Number (ISSN) for the Journal, for both print and online version.
20. Organize a workshop in cooperation with WMO/DRR/ Public Weather Services Programme (PWS) media on the theme of “Effective Warning”.
21. Encourage the development of high resolution typhoon model for enhancing the forecast capability of gale and quantitative precipitation in Typhoon Committee region (especially in South China Sea).
22. Strengthen the cooperation with Working Group on Hydrology (WGH) and the Working Group Disaster Risk Reduction (WGDRR) towards evaluation of tropical cyclone impact (including disaster and benefit) and risk management.
23. Enhance the collaboration with Training and Research Coordinating Group (TRCG) towards the exchange and training of latest progress and techniques related to tropical cyclone research and operational forecast, as well as the effectiveness of typhoon operational warning system.
24. Investigate methods to improve the timing of upgrading/downgrading of tropical cyclone intensity particularly upgrading the tropical depression and study improvement of real-time observations exchange between RSMC Tokyo and Members and submit a proposal to the 44<sup>th</sup> Session.
25. Exchange historical best track datasets including current intensity (CI) numbers for inter-comparison.
26. Implement a pilot project “South China Sea Typhoon Forecast” at initiation of China Meteorological Administration (CMA) and encourage all interested Members to participate to improve the cooperation among Members in developing tropical cyclone forecasting skills.
27. Appoint Mr. Masashi Kunitsugu (Japan) as the Typhoon Committee Operational Manual (TOM) Rapporteur.
28. Request Mr. Masashi Kunitsugu (Japan) to consolidate the inputs of technical procedures for best-track analysis of the centres for inclusion in TOM.

### **Hydrological Component**

29. Appoint Mr. Minoru KAMOTO, Japan, as WGH Chair, and appoint Dr. Yang-Soo KIM, Republic of Korea, and to re-appoint Mr. LIU Zhiyu, China, as Vice Chairs of WGH.
30. Assign to task force (TF) Members the responsibility of providing expertise guidance and advice to UFRM implementation: the Chair of WGM, Mr. Xiaotu LEI, and the Director of RSMC, Mr. Masashi KUNITSUGU, to take care of meteorological aspect; Chair and Vice-Chairs

of WGH Mr. Minoru KAMOTO, Dr. Zhiyu LIU and Dr. Yang-soo KIM to take care of hydrological aspect; Chair and representatives of WGDRR, Dr. Sang Man JEONG, Dr. Tae Sung CHEONG and Ms. Hilda LAM to take care of DRR aspect; and to request WGM, WGH and WGDRR to consider how to combine their activities with and contribute to the TC cross-cutting project on UFRM.

31. Call on Members to provide training and expertise on QPE/QPF, hydrological/ hydraulic modelling and inundation mapping for UFRM pilot project as in-kind contribution.

32. Request TF through TCS to issue invitation letters to the Members to provide the experts for training and assistance for UFRM pilot project.

33. Request the Members of Pilot Cities of the project on UFRM to explore mobilization the self-funding support for the pilot studies.

34. Request TCS to include a request for Kuala Lumpur to be one of pilot cities in the UFRM project in the letter of appreciation regarding OJT to the Director General of the Department of Irrigation and Drainage (DID) Malaysia.

35. Request strong collaboration of 3 working groups, AWG and TF and close linkage with WMO and ESCAP to push forward the project UFRM.

36. Request the Information and Communication Technologies (ICT) and Disaster Risk Reduction (DRR) Division of ESCAP to fund and organize a meeting in July or August 2011 to review the consultancy, to discuss the implementation of pilot study and the preparation of the final guidelines of the UFRM project.

37. Set up the channel to link the TC cross-cutting project of UFRM with the agencies of City-Net and International Strategy for Disaster Reduction (ISDR).

38. Request ESCAP Secretariat to consider developing simplified awareness and capacity-building materials and handbooks suitable for decision makers and non-scientists on the possibilities offered by satellite applications for disaster risk reduction and damage assessment, as well as simplified technical materials for technical staff in developing countries.

39. Request the International Centre for Water Hazard and Risk Management (ICHARM) to consider conducting training course for interested Members on IFAS.

40. Appoint the hydrologist of TCS Mr. Jinping LIU as the liaison of WMO Regional Association II (RA II) and Regional Association (RA V) WGHs for the Committee.

### **Disaster Risk Reduction Component**

41. Appoint Dr. Sangman JEONG from the National Institute for Disaster Prevention (NIDP); the National Emergency Management Agency of the Republic of Korea (NEMA) and Dr. Hilda LAM from Hong Kong Observatory, Hong Kong, China as Chair and Vice Chair of the WGDRR respectively.

42. Enhance the ongoing project on WEB-GIS based Typhoon Committee Disaster Information System (WGTCDIS) to serve as a portal site for sharing disaster risk reduction technologies and information among TC Members.
43. Extend WGTCDIS for Multi-Hazard Early Warning Systems in conjunction with other WGs and to promote its linkage with systems in other WGs.
44. Send two expert missions on the WGTCDIS to 6 TC Members namely Lao PDR; Thailand; Philippines; Cambodia; USA and Japan in 2011.
45. 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 and Public Weather Service (PWS) Programs and UN/ISDR, as well as WGM and WGH, and consider if these would need to be added during the expert mission.
46. Organize the 6th WGD RR Workshop in Republic of Korea during May 2011.
47. Extend the project on the real-time transmission of severe weather warnings using SWIdget<sup>1</sup> in Severe Weather Information Centre (SWIC) to a couple of interested Members in 2011.
48. Set up automatic weather stations for the community based weather station projects in 2 interested Members.
49. Request the Committee to endorse further collaboration with WMO through participation of the Chair of WGD RR in activities of WMO RA II and RA V working groups related to DRR.
50. Strengthen regional cooperation of national meteorological and hydrological services (NMHSs) with the disaster risk management agencies from national to local levels in multi-hazard warning systems.

### **Training and Research Component**

51. Re-establish the Training and Research Coordinating Group (TRCG) with the re-appointment of Mr. Edwin S.T. LAI (Hong Kong, China) and the appointment of Mr. Roger EDSON (USA) as Chair and Vice Chair of TRCG, respectively.
52. Request TRCG to seek inputs from WGM, WGH and WGD RR and others on planned training and research activities within the Region and provide a consolidated list to all Members.
53. Encourage Members to support participation of TRCG members in TRCG-related meetings/activities as far as possible so that good continuity in TRCG work can be maintained.

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<sup>1</sup> To allow personal computer (PC) users to select and display automatically in their PCs real-time weather warnings in different regions, a user-friendly new service called SWIdget was launched on the SWIC platform in June 2010, by Hong Kong Observatory.

54. Request Members to offer or take part in research fellowship programs on the themes including Typhoon Information and Processing Systems (TIPS), Ensemble Prediction Systems (EPS), Quantitative Precipitation Estimation and Quantitative Precipitation Forecast (QPE/QPF) and consensus forecasts.

55. Endorse the proposed TRCG Annual Operating Plan (AOP) for 2011, including the organization of a roving seminar under the support of Typhoon Committee Trust Fund, with Malaysia offering to host the seminar in 2011.

56. Request TRCG to review and evaluate TRCG activities on Research Fellowship Scheme and Roving Seminars in previous years and incorporate the outcome of the review in future plans.

## **II. Main activities of the Typhoon Committee during 2010**

### **A. Meteorological Component**

The Committee noted that the assessment report on the impact of climate change on tropical cyclone frequency and intensity variation was finished and published in Typhoon Committee 43rd session. The draft of the second assessment report is ongoing and is planned to be distributed in Typhoon Committee 44<sup>th</sup> Session.

The Committee noted that a new polar orbiting meteorological satellite (FY-3B) was launched on November 5, 2010.

The Committee was informed that CMA had established 8 CINRAD radars, 191 shore-based stations, 84 automatic weather stations (AWSs) on islands, 18 buoys, 1 storm surge station, 6 oil drilling platform-based stations and 4 ship stations, and put into operational use by the end of 2010.

The Committee was informed that CMA started development of the next generation data broadcast system (CMACast) in 2010.

The Committee was informed that CMA established a super ensemble typhoon track prediction system.

The Committee was informed that the Tropical Cyclone Information Display and Processing System of Hong Kong China was enhanced with incorporation of the Observatory's mesoscale non-hydrostatic model (meso-NHM) and models from other TC Members.

The Committee was informed that the new generation numerical weather prediction (NWP) system of the Hong Kong China has been put into operation since June 2010.

The Committee noted that Hong Kong China enhanced its tropical cyclone track information webpage employing Google Map that could help the public to identify more easily the areas affected by tropical cyclones. The Observatory developed an iPhone application to provide individuals with a comprehensive and personalized weather service any time and anywhere.

The Committee was pleased that RSMC Tokyo summarized the results of a questionnaire survey on the present status of Quantitative

Precipitation Estimation (QPE)/ Quantitative Precipitation Forecast (QPF) techniques of Members.

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 Committee noted that, on 1 July 2010, JMA switched over imaging satellite operations to the Multi-functional Transport Satellite-2 (MTSAT-2) from MTSAT-1R.

The Committee noted an increase in accuracy of JMA's tropical cyclone forecasts was achieved by upgrading the typhoon bogus scheme used for initialization of tropical cyclones.

The Committee was pleased that RSMC Tokyo announced the start of provision of storm surge distribution maps to Members at the numerical typhoon prediction website to assist their forecasting of storm surges from the typhoon season in 2011.

The Committee was informed that, RSMC Tokyo is designated as the Regional Centre for Tropical Cyclone Forecasting Support of the Severe Weather Forecasting Demonstration Project (SWFDP) in the WMO RA II region (Asia) to provide typhoon related products.

The Committee was pleased that JMA set up the website under the North-western Pacific Tropical Cyclone Ensemble Forecast Project (NWP-TCEFP) of WMO in May 2010.

The Committee noted with pleasure that major hardware and software improvements and upgrades were done to the existing conventional radar station network at the Malaysian Meteorological Department (MMD). Upgrades were done on all the existing conventional radar stations to convert them to Doppler radar stations.

The Committee noted that Philippines installed a new Automatic Aviation Weather Observation System and a wind profiler, 2 meteorological buoys, Doppler radars, and put new Radiosonde stations into operation.

The Committee was informed that the Korea Meteorological Administration (KMA) started to operate UK Met Office's Unified Model (UM, N312, 50 levels) for global and regional prediction in May 2010.

The Committee was informed that KMA continued to improve typhoon initialization of global data assimilation and prediction system (GDAPS).

The Committee was informed that the KMA's Ensemble Prediction System has been updated with the Unified Model (UM) in December 2010.

The Committee noted with pleasure that Republic of Korea's first geostationary satellite, Communication, Ocean, and Meteorological Satellite (COMS) was successfully launched from the Arianespace launch site in Kourou, French Guiana, on 26 June.



The Committee was informed that the Republic of Korea has been conducting a three-year (2009-2012) project “Establishment of an Early Warning and Monitoring System for Disaster Mitigation in Metro Manila” under the sponsorship of the Korea International Cooperation Agency (KOICA).

The Committee was informed that KMA and CMA organized the third Joint Workshop on Tropical Cyclones in Jeju, Republic of Korea, on 20-23 December 2010.

The Committee noted that Meteorological Service Division (MSD) of Singapore is currently in the process of implementing a comprehensive On-Line Weather Monitoring Network.

The Committee noted with pleasure the improvements in the radar network in Thailand, three C-band Doppler Radars which started the installations in the South of Thailand in 2010. Totally, there are 25 weather radars in the Thai Meteorological Department (TMD)'s precipitation monitoring network.

The Committee was informed that the Indian Institute of Technology (IIT) Storm Surge Model was adopted in TMD's storm surge forecasting, with 1 km resolution bathymetry data interpolated from the ETOPO1 (1 arc-minute global relief model of Earth's surface that integrates land topography and ocean bathymetry).

The Committee noted that TMD makes effort to carry out the Meteorological Telecommunication Data Storing and Recording Project, which was started in 2009, and is expected to complete by the end of 2011.

The Committee was informed that during tropical cyclone season in 2010, RSMC Honolulu began providing specific probabilities of development (10%, 20%, 30%, etc.) rather than a three categorical outlook.

The Committee was informed that WMO “The Observing System Research and Predictability Experiment” (THORPEX) Pacific Asian Regional Campaign (T-PARC) continued this past year with the TCS10/ITOP (Impact of Typhoons on the Ocean in the Pacific Ocean) field experiment that was held in the western North Pacific between 20 August and 20 October 2010.

The Committee was informed that the US is participating in the WMO RA-V (South-West Pacific) Severe Weather Forecasting Demonstration and Disaster risk reduction Project (SWFDDP) for the South Pacific Islands.

## **B. Hydrological Component**

The Committee was informed on the progresses and future activities of the projects: (1) OJT on Flood Forecasting between TC Members led by Malaysia; (2) UFRM in TC region, led by China; (3) Assessment System of Flood Control Measures on Socio-economic Impacts, led by Republic of Korea; (4) Hazard Mapping for Sediment-related Disasters, led by Japan; (5) Establishment of Flood Disaster Preparedness Indices (FDPI), led by Japan; (6) Use of satellite-based information for reducing water-related disaster risks, driven by ESCAP.

The Committee was pleased to note the successful achievements of the OJT in Malaysia: four training courses were conducted by Department of Irrigation and Drainage (DID) of Malaysia since 2008 and total of 11 participants from China, Lao PDR, Philippines, Thailand, Viet Nam. The Committee expressed its great appreciation to Malaysian Government for the contribution to TC activities.

The Committee noted with pleasure that China compiled the report of good practice on UFRM with strong support and cooperation from the focal points of WGH, WGM and WGDRR in China, Japan and Republic of Korea.

The Committee noted with appreciation that the ICT and DRR Division of ESCAP gave strong support to UFRM in 2010: (1) organized the TC UFRM expert meeting; (2) contracted the project consultant to push forward this cross cutting project. The Committee also noted with pleasure that ESCAP expressed its willingness to explore the possibility to: (a) assess the consultancy report; (b) organize a meeting on UFRM pilot study in July or August 2011 and (c) continue to contact donors for resources mobilization.

The Committee was pleased to note that the UFRM Task Force Mission was implemented successfully and fruitfully in December 2010 in 3 pilot cities: HatYai, Thailand; Metro Manila, Philippines and Hanoi, Viet Nam. The Committee expressed its appreciation to Thailand, Philippines, Viet Nam and Ministry of Water Resources (MWR) of China for their strong support and cooperation.

The Committee noted with appreciation that the ESCAP contracted the consultant of UFRM project Prof. Xiaotao Cheng, from China Institute of Water Resources and Hydropower Research (IWHR). He submitted the draft consultancy report as a preliminary guidance material of implementation of pilot study.

The Committee noted with pleasure that the workshop on “Space Application to Reduce Water-related Disaster Risk in Asia (SARWDR)” was jointly organized by ESCAP and ICHARM in partnership with WMO and TC, and with support by the Japan Aerospace Exploration Agency (JAXA) and the Asian Development Bank (ADB) in December 2010. The ICHARM delivered its training on the Integrated Flood Analysis System (IFAS) at workshop of SARWDR for participants from Members.

The Committee noted with appreciation that the Korea's Ministry of Land, Transport, and Maritime Affairs (MLTM) together with the Korea Institute of Construction Technology (KICT), the Ministry of Land, Infrastructure, Transport and Tourism of Japan (MLIT) together with the Infrastructure Development Institute – Japan (IDI) provided funding support to WGH participants to participate in the 5<sup>th</sup> TC integrated workshop. MLTM/KICT and MLIT/IDI will consider supporting the hydrologists of Members for participation of TC integrated workshop in future.

The Committee was pleased to note that the efforts were made to enhance cooperation between the two working groups on hydrology of WMO Regional Association II (RA II) and the Committee in past years.

The Committee noted with pleasure that WGH is actively involved in the WMO-organized workshops on QPE/QPF and tropical cyclone in 2010 with funding support from WMO.

### **C. Disaster Risk Reduction Component**

The Committee reviewed the activities of the TC Members, UNESCAP, WMO and other collaborating organizations, during the past year. Activities within the DRR component among the Members included progress on WEB-GIS based Typhoon Committee Disaster Information System (WGTCDIS) project; the 5<sup>th</sup> WGDRR Workshop in Incheon, Republic of Korea; Integrated Workshop in Macao, China; publication of the report on Flash Flood Forecasting System.

The Committee was informed that twenty-three representatives from Members and international organizations attended the 5th WGDRR Workshop that was held in Incheon during 25-26 October 2010. During the meeting, the group agreed to provide inputs to the WEB-GIS based TCDIS (WGTCDIS) by early February 2011. The participants also discussed vision and future activities of WGTCDIS.

The Committee noted that progress was made in the project on warning dissemination. Hong Kong, China implemented the function to disseminate warnings through the Severe Weather Information Center (SWIC) which was named SWidget (<http://severe.worldweather.org/swidget/swidget.html>) and launched in 2010 with warnings from Hong Kong, China; Macao, China; Guam, USA; Republic of Korea and Singapore.

### **D. Training and Research Component**

The Committee expressed its appreciation to Thai Meteorological Department (TMD) for hosting the Roving Seminar in Ubon Ratachani, Thailand in November 2010. The Committee also appreciated the support provided by the three resource persons for the Roving Seminar from Hong Kong Observatory, Peking University and University of Guam.

The Committee thanked China; Hong Kong, China and Republic of Korea for hosting research fellowship programmes in 2010.

The Committee took note of the successful training attachment of forecasters from Hong Kong, China and Singapore to RSMC Tokyo in July 2010, and thanked JMA and WMO Tropical Cyclone Programme (TCP) for continuously supporting this capacity-building initiative.

### **E. Activities of the Advisory Working Group (AWG)**

The AWG selected the NOAA-Pacific Region of USA and the NEMA of Republic of Korea for the Dr. Roman L. KINTANAR Award for Typhoon related Disaster Mitigation.

The Committee noted with satisfaction the status of the 2010 AOP. The final results for WGM: WGM 8 Objectives, 14 Success Indicators, 12 Success Indicators met; WGH 6 Objectives, 23 Success Indicators, 14 Success Indicators met; WGDRR 8 Objectives, 9 Success Indicators, 8 Success Indicators met; TRCG 3 Objectives, 3 Success Indicators, 3 Success Indicators met.

The Committee was informed that the AWG reviewed the 2010 AOP and prepared the proposed 2011 AOP, 2011 Budget and initial ideas for an updated Strategic Plan

The Committee noted important continued progress since the introduction of the 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 the ESCAP and WMO as well as the enhanced roles of the TCS.

In respect of development of draft 2011-2015 Strategic Plan presented by the AWG, after Committee discussion it was decided that the current plan (2007-2011) will continue to be effective until the approval at the 44<sup>th</sup> Session of an updated 2012-2016 Strategic Plan with additional Associated Activities and increased focus.

The Committee expressed sincere appreciation to Mr. James Weyman AWG Vice-Chair, for his significant contribution to the development of the Committee activities, in particular for his key role played in the development of the Strategic Plan and enhancing the effectiveness and efficiency of the Committee in the past 11 years.

#### **F. Activities of Typhoon Committee Secretariat**

The Committee took note of the report prepared by the Secretary of the Typhoon Committee and the proposal of Macao, China for the reappointment of the Secretary of TC.

The Committee thanked the Government of Macao, China for its continued support to provide headquarters and endowment fund for TCS operation and for the revision of the agreement between Macao, China and the TC regarding administrative and financial aspects. It is noted that this revision was signed by TC Chair and the representative of the Government of Macao, China.

The Committee expressed its appreciation to Government of Macao, China for the secondment of a meteorologist, Mr. LEONG Kai Hong (Derek) and its offer to continue that secondment until the end of the second four-year period that the TCS will remain in Macao, China.

The Committee expressed its appreciation to the Government of China for the secondment of a hydrologist, Mr. Jinping LIU to TCS for a second four-year period.

The Committee appreciated the excellent efforts of TCS in support of the activities of the Committee.

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 2010 and beyond.

The Committee thanked the Macao Foundation for the financial support to the activities of TC namely to the Field Training Hazard Mapping of Sediment-related Disaster and to the Integrated Workshop on

Urban Flood Risk Management in a Changing Climate: Sustainable and Adaptation Challenges, which were held in Zhuhai and Macao, China.

The Committee thanked the Government of Macao, China for hosting the ESCAP/WMO Typhoon Committee Integrated Workshop on 6-10 September 2010. The Workshop provided the opportunity to review the progress of the various activities endorsed by the Committee at its 42nd Session.

### **III. Review of the 2010 typhoon season**

The Committee took note with appreciation the review of the 2010 typhoon season provided by the RSMC Tokyo-Typhoon Center.

The Committee noted that in the western North Pacific, 14 named tropical cyclones (TCs) formed in 2010, seven of which reached typhoon (TY) intensity. The total is the least since 1951, breaking the previous record of 16 in 1998.

After the formation of Omais in March, tropical cyclones activities were generally weak through the year. No named TCs formed from April to June. This is the fourth time since 1951 with 1973, 1975 and 1998. From November to December, no named TCs formed. This is the first time since 1951.

### **IV. Publications**

The Committee took note that the TCS published the 22<sup>nd</sup> issue of the Typhoon Committee Newsletter in January 2010 and the 2009 Typhoon Committee Annual Review (TCAR) in January 2010 and disseminated them to the Members, ESCAP and WMO in electronic (CD-ROM) format.

The Committee noted with appreciation that the RSMC Tokyo – Typhoon Center published the “Technical Review No.12” in March 2010 and the “Annual Report on the Activities of the RSMC Tokyo – Typhoon Center in 2009” in December 2010. 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>.

The Committee took note on the coordination by TCS of two publications under the series of technical publications of TC, “Assessment Report on Tropical Cyclones Frequency and Intensity in the TC Region” (TC/TD 0001) and the WGDRR publication “Report on Mountainous Flash Flood Forecast System Manual” (TC/TD 0002).

### **V. Coordination with other activities of the WMO Tropical Cyclone Programme**

The Committee was informed by the WMO Secretariat of the basic principles of the Tropical Cyclone Programme (TCP) in the implementation of the Programme’s activities as follows: (a) To enhance support measures for TC forecasters; (b) To transfer R&D results into operational forecasting; (c) To establish Storm Surge Watch Schemes (SSWSs) and strengthen the storm-surge warning capabilities of National Meteorological and Hydrological Services (NMHSs); (d) To continue to put high priority on capacity building.

The Committee noted that, in the implementation of the global SSWS, Japan's plan to contribute to SSWS through production and dissemination of the storm-surge distribution map in 2011 and the time-series chart in 2012 in the Typhoon Committee region. In that regard, the Committee welcomed the TCP's plan to organize a storm surge workshop for the Committee Members in October 2011 in Macao, China.

The Committee was informed that the various international forums were organized by TCP in cooperation with the World Weather Watch Programme (WWW) of WMO such as the Second International Workshop on Typhoon Landfall Processes (IWTCLP-II; Oct 2009, Shanghai, China), the Third International Conference on QPE/QPF & Hydrology (Oct 2010, Nanjing, China) and the Seventh International Workshop on Tropical Cyclones (IWTC-VII; Nov 2010, La Reunion).

Typhoon Landfall Forecast Demonstration Project (TLFDP) and the NW Pacific Tropical Cyclones Ensemble Forecast Project (NW-P/TCEFP) are the tangible outcomes of IWTCLP-II, which were launched jointly by TCP and the World Weather Research Programme (WWRP) in 2009 targeting at the Members of the Typhoon Committee.

The Committee noted that update of the Global Guide to Tropical Cyclone Forecasting will be completed by the middle of 2011. In addition, the WMO Tropical Cyclone Forecaster Website has been developed to provide a readily accessible source of forecast tools and analytical data necessary for operational forecasting.

The Committee noted with satisfaction that the study on suitable conversion factors between the wind speeds of different time ranges was completed and its outcome was distributed as a WMO Technical Document (WMO/TD-No.1555) to the Committee Members in October 2010.

The Committee was informed that development of WMO Severe Weather Forecasting Demonstration Project (SWFDP) in Southeast Asia is in progress for improving severe weather forecasting and warning services in developing countries in this region including Cambodia, Lao People's Democratic Republic, Thailand and Viet Nam.

The Committee was pleased to note that Dr LIU Jinping of TCS represented the Committee in the meeting of the WMO/RA II Working Group of Hydrology which was held in Seoul, Republic of Korea from 23 to 26 November 2010.

Prof R. Elsberry presented summary and selected recommendations from IWTC-VII and a summary of the tropical cyclone-related presentations at the third WMO International Conference on QPE/QPF and Hydrology.

Hong Kong, China informed the Committee about a recent cooperation between Google and WMO to increase the public's awareness of active tropical cyclones around the world under the Google Onebox and Google Earth projects.

In this connection, WMO Secretariat expressed the promotion of harmonization and standardization in forecasting procedures and warning services on a global basis is increasingly important and thus requires necessary actions of TCP to be addressed.

## **VI. Programme for 2011 and beyond**

The Committee noted with pleasure the attendance and participation of the representative of Indonesia and encouraged continuing participation as well as membership in the Committee.

The Committee requested the AWG to: (a) Review the format and content of the future AOP and to submit an integrated proposal to the 44<sup>th</sup> Session; (b) Coordinate with Members, Working Groups and Secretariats to review the purpose and format of the written and oral Member Reports and make necessary recommendation to the 44<sup>th</sup> Session; (c) Coordinate with Members, TRCG, Working Groups and Secretariats to review, investigate, and implement methods and procedures to evaluate the effectiveness of training and workshops and present findings and recommendations at 44<sup>th</sup> Session; (d) Review and evaluate the operations and activities of the Typhoon Committee for enhanced efficiency and effectiveness and report back to 44<sup>th</sup> Session with recommendations and proposals taking into account the needs of Members; (e) Explore the specification of in-kind contribution for each TC Trust Fund project and report findings to the 44<sup>th</sup> Session to encourage external fund raising; (f) In consultation with TCS, study the possibility the discontinuation of the TCAR and change the newsletter to be published twice a year and report to the 44<sup>th</sup> Session; (g) Harmonize the expenditures documented by WMO and TCS and incorporate into the documents presented by AWG; (h) To review the organization of the Session Meeting including the consideration of setting out one day for technical portion of the Session.

The Committee requested TCS to: (a) Coordinate the provision of documents on TC Website for future Sessions 1 month before; (b) Provide the official basic documents of the Committee on TC Website, including the Strategic Plan, Session Reports and rules and procedures in an easy identifiable way.

## **VII. Support required for the Committee's programme**

### **Technical Cooperation**

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 2010, 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.

The Committee noted that, under a WB/ISDR/WMO regional disaster risk management and adaptation programme, assessment of the capacities, gaps and needs of NMHSs and evaluation of requirements of disaster risk management agencies and stakeholders has been completed for countries in Southeast Asia including Cambodia, Lao People's Democratic Republic, Philippines and Viet Nam.

It also noted that, in 2010, 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 the requests for expert services for Cambodia and DPRK. In view of the VCP potential in support of activities of the Typhoon Committee, the Committee encouraged Members to further actively participate in the VCP activities. The Committee was also informed that bilateral assistance was provided by Japan to Lao PDR to improve meteorological services and by China for the upgrade of FengYunCast receiving systems for 14 countries including six Members of the Committee.

Within the framework of the TCDC, China organized the International Training Seminar on South-South Cooperation on Weather and Climate in November 2010 in Nanjing Regional Training Centre. Seven members (Cambodia, China, Japan, Lao PDR, Malaysia, Republic of Korea and Thailand) of the Committee participated in the Training Seminar. The 2010 China Study Tour was carried out in May 2010 in conjunction with the opening of the MeteoWorld Pavilion in Shanghai Expo 2010.

The Committee further noted the recent emergency assistance provided under the Emergency Assistance Fund scheme to WMO Members affected by natural disasters, including Lao PDR for the restoration of damaged meteorological instruments and equipment at synoptic stations following TY Ketsana was ongoing with the support of China.

WMO in collaboration with ESCAP carried out a fact-finding and needs-assessment mission to Pakistan following the 2010 floods. TC Members were invited to give consideration of possible support, as appropriate, in particular for short-term requirements of the Pakistan Meteorological Department (PMD). Hong Kong, China informed that in response to a request from Pakistan Meteorological Department (PMD), forecast products were launched for 20 Pakistani cities under the WMO RA II Pilot Project on the Provision of City-Specific NWP Products.

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

The Committee was informed that the TCS concluded the Memorandum of Understanding (MoU) between WMO and TCS referring to TCTF arrangement and WMO provided legal review, as requested by decision of the Committee in the 42<sup>nd</sup> Session.

The Committee reviewed the statement of account of TCTF for the period of 1 January to 31 December 2009 and the provisional statement for 1 January to 31 December 2010 submitted by the representative of the WMO Secretariat.

## **VIII. Scientific lectures**

The Committee expressed its appreciation to all the lecturers and requested the TCS to disseminate all the lecture papers/PowerPoint presentations and to include them in the Typhoon Committee Annual Review for 2010.

## **IX. Date and place of the forty-fourth session**

The Committee noted that TCS will send Circular Letter to Members to invite proposals on the possible dates and host for the Forty Fourth



Session in 2012. The dates and the host will be coordinated through the TCS and announced by March 2011.

## **X. Acknowledgement**

The delegates from the Members of the Typhoon Committee, representatives of ESCAP, WMO and TCS and observers expressed their thanks and appreciation to the Korea Meteorological Administration of Republic of Korea for the successful hosting of the Forty Third session of the Typhoon Committee. They also expressed gratitude to Dr. Byung-Seong CHUN, Administrator of KMA and his staff for the warm hospitality and excellent arrangements made and also for organizing a tour through the beautiful sites of Jeju Island, Republic of Korea.

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