TC
THE ESCAP/WMO
Typhoon Committee
NEWSLETTER

No. 4 September 1992

1st Joint Session of the Panel on Tropical Cyclones and the Typhoon Committee in Pattaya, Thailand

The first Joint Session of the Panel on Tropical Cyclones and the Typhoon Committee, convened by ESCAP in cooperation with WMO, was held in Pattaya, Thailand, from 18 to 27 February 1992.

The joint session, the twenty-fourth and eighteenth session for the Typhoon Committee and the Panel on Tropical Cyclones, respectively, was attended by sixty six participants including representatives of six Members of the Panel (Bangladesh, India, Maldives, Pakistan, Sri Lanka, Thailand) and eight Members of the Committee (China, Hong Kong, Japan, Republic of Korea, Malaysia, the Philippines, Thailand, Viet Nam). Observers came from Germany, Indonesia, Macau, the U.S.A.-RA IV Hurricane Committee, United Nations Office of the Disaster Relief Coordinator (UNDRO), International Civil Aviation Organization (ICAO), International Federation of Red Cross and Red Crescent Societies (IFRC) and the Commission on Atmospheric Sciences (CAS).

Mr. Smith Tumsaroch, Director-General of Thailand Meteorological Department, cited in his welcome address, the substantial progress made in the implementation of the Committee and the Panel's Regional Cooperation Programme such as the installation and modernization of upper-air-observation stations, cyclone detection radar and satellite ground receivers, and upgrading of telecommunication systems. These activities, he said, would create a better data base and analysis system which would lead to greatly improved forecasting, warning, mitigation and preparedness systems. He noted the August-September 1990 combined SPECTRUM observation which resulted in a very rich and comprehensive data set for further studies of the typhoon motion, behavior and impact in the Western Pacific. He added that more accurate short and long-term forecasts could result through the introduction and development of more advanced remote-sensing techniques and sophisticated numerical computer models.

Dignitaries (top photo) formally open the joint session. From left, Mr. S. Tumsaroch, Director-General of TMD; Mr. R. Sriprasertsuk, Deputy Permanent Secretary, MTC; Dr. G.O.P. Obasi, Secretary-General of WMO and Ms. S. Takahashi, Deputy Executive Secretary of ESCAP. (Above) Mr. Tumsaroch exchanges pleasantries with Ms. Takahashi prior to a photo session of all the delegates. Also in photo are (from left) Dr. R. Kintanar, Coordinator, TCS; Mr. Sriprasertsuk; Dr. Obasi; Mr. Choi Jung-Boo, Senior Forecaster, KMA; Mr. M.H. Khan Chowdhury, Coordinator, TSU and Dr. Patipat Patvivatsiri, Director, SRD, TMD.

Mr. Roungroj Sriprasertsuk, Deputy Permanent Secretary of the Ministry of Transport and Communications of Thailand, expressed in his greetings that with the world's attention currently focused on climate and environment-related issues, his country has set its eyes on the prevention and mitigation of tropical cyclone disasters and related phenomena in the context of IDNDR. He hoped that the two bodies would continue to serve as

(Turn to next page)

a useful forum for views and proposals on new cooperative actions in mitigating typhoon, cyclone and storm surge disasters.

Prof. G.O.P. Obasi, WMO Secretary-General, complimented the Panel and the Committee for their past achievements but stressed that further efforts were necessary, particularly, in the area of disaster prevention and preparedness. He cited his organization's serious determined effort toward achieving the goals of the IDNDR and addressing natural disasters in its contributions to the preparatory process of the United Nations Conference on Environment and Development in Rio de Janeiro in mid-1992. The Secretary-General thanked the Government of Thailand for its hosting of the Joint Session.

Ms. Seiko Takahashi, Deputy Executive Secretary of ESCAP, read the statement of Executive Secretary S.A.M.S. Kibria which recalled the critical role ESCAP had played over the last 45 years in mitigating water-related natural disasters. It had continued since 1990 its earlier work on flood prevention and disaster reduction in time with the launching of IDNDR in the ESCAP region held at the ESCAP/UNDRO Regional Symposium on the Decade. The Symposium, which was attended by disaster managers and specialists, had resulted in a plan of actions and recommendations for disaster reduction, a lot of which were specific to water-related calamities. The joint session, Kibria said, would provide a unique opportunity for the Members of the two bodies to exchange experience and improve regional cooperation on disaster mitigation in the Pacific and Indian oceans.

Elected as officers of the session were Mr. F. M. Qasim Malik of Pakistan and Dr. Patipat Patvivatsiri of Thailand as Chairman and Vice-Chairman, respectively. Also elected were Dr. S. Kumar (India), Chairman for Sub-committee A of the Panel, Dr. Takashi Nitta (Japan), Chairman for Sub-committee B of the Committee, and Mr. P. Sham (Hong Kong) as Chairman of the Drafting Committee.

Having a great time: Session bigwigs laugh it up at reception party, from left, H. T. Yuen, R. Sarker, J. Rasmussen – (all of WMO), J. Jarrell, R. Elsberry (both of USA), P. Sham (Hong Kong) and P. Markandan (Malaysia).

At the meeting, it was felt that the combined session of the Panel and the Committee was a significant step toward strengthening cooperation between the two regional tropical cyclone bodies. It was agreed that the coordination of programmes and activities of the Typhoon Committee Secretariat (TCS) and the Technical Support Unit (TSU) could be further enhanced through frequent exchange of information between their bodies. In this respect, it was also agreed that the existing focal point system under the three components of the Committee (meteorological, hydrological and disaster prevention and preparedness) should be extended to the Panel. The activities under TCDC arrangements, it was added, should be promoted to all the Members of the Panel and the Committee, such as in the provision of consultancy services, forecasters' attachment to advanced centres, exchange programmes, group training events and study tours.

The joint session had recognized the importance and advantage of inter-regional coordination and cooperation. It was suggested that WMO should promote an exchange of meteorological application software on tropical cyclone forecasting services as a means to strengthen the collaboration among the five regional tropical cyclone bodies. The WMO was also requested to make use of its influence for a possible satellite coverage of the Indian Ocean region. An operational geostationary meteorological satellite to cover the area was considered vital for the global observing system since the Indian Ocean encompassed one of the crucial energetic zones of the general circulation, including the major monsoon areas.

The meeting was encouraged by the RSMC-Tokyo report of a slight but significant improvement in the operation of the Global Telecommunication System (GTS) and the observing system based on the results of the 1991 monitoring. The meeting was also informed of the implementation of the new WMO Global Maritime Distress and Safety System (GMDSS) for the preparation and dissemination of meteorological forecasts and warnings for

(Turn to page 13)

Other participants in opening's photo session.

SPECTRUM Technical Conference in GUANGZHOU

At the conference proper presided by (from left to right) TCS Meteorologist G. Monroy, SMA Deputy Administrator Ma Henian, WMO Representative K. Abe and GPMB & GRMC Director Xie Guotao.

The SPECTRUM Technical Conference, organized by the World Meteorological Organization (WMO) at the request of the Typhoon Committee in cooperation with the Typhoon Committee Secretariat and the Government of China, was successfully held at the Dong Fang Hotel, in Guangzhou, China, from November 25-29, 1991.

The technical conference was attended by experts designated by member countries of the Typhoon Committee that participated in the Special Experiment Concerning Typhoon Recurvature and Unusual Movement (SPECTRUM), spearheaded by the members of the SPECTRUM Research Coordinating Group (SRCG) which was formed last year to take over the SPECTRUM Steering Group. Completing the attendants were the observers from WMO, TCS, the USA and WMO's Commission for Atmospheric Sciences (CAS).

Opening addresses were given by Messrs. Ma Henian, Deputy Administrator of the State Meteorological Administration (SMA), Xie Guotao, Director of Guandong Provincial Meteorological Bureau (GPMB) and Guangzhou Regional Meteorological Centre (GRMC) and Katsuhiro Abe, WMO Secretariat representative.

In welcoming the participants, Mr. Henian thanked the Typhoon Committee for providing advancement to China's typhoon forecasting and warning system. He expressed his government's willingness to participate in the SPECTRUM since it is China's intention to support every endeavor of the Committee in improving typhoon forecasts and warnings. He hoped further studies be pursued on sudden recurvature and intensification of typhoons and the interaction between oceans and typhoons.

Mr. Guotao spoke in behalf of GPMB an GRMC and noted that because of Guandong's geographic location as a typhoon-prone southern province, the critical role of the Regional Meteorological Centre in weather forecasting has become more apparent. He looked forward to gaining knowledge in the mechanism of typhoon recurvature and unusual movement and from the exchange of research results and experience on typhoon motion gained through the SPECTRUM.

For his part, Mr. Abe, WMO Secretariat representative, expressed appreciation and gratitude to the government of China for hosting the technical conference and its active participation at the regional level in the SPECTRUM and at the national level to promote studies and research on typhoon motion. The WMO noted the need for the conference to focus on present and future studies and research related to typhoon movement through the use of data obtained from the SPECTRUM field experiment. The world body was pleased to organize the conference within the framework of the International Decade for National Disaster Reduction (IDNDR).

At the technical presentation of the topics, Mr. C.Y. Lam, Chairman of the former SPECTRUM Steering Group, stressed that the improvement of operational tropical cyclone forecasting, particularly of movement forecasting was the ultimate goal of the SPECTRUM. He described SPECTRUM 1990 as exceptionally successful in terms of the amount and variety of data collected. It was able to pinpoint the problems which the experiment was posed to study, such as recurvature, westward movement, despite weakness in the subtropical ridge, and

(To next page)

Participants gather at Dong Fang Hotel at SPECTRUM's opening.

SPECTRUM...

(From page 3)

interaction with the environment.

Prof. Russell Elsberry, Experiment Director for the US Tropical Cyclone Motion (TCM-90) experiment, cited the increasing cooperation with SPECTRUM and the other international experiments during the planning, coordination of Intensive Observing Periods (IOP) whenever possible, and the sharing of delayed data after the experimental period. He reminded that TCM-90 was a research-oriented experiment to understand the effects of the subtropical ridge and adjacent synoptic features interactions with the tropical cyclone in causing changes in motion. Thus, it was essential to collect the best possible data set, including special experimental observations and delayed data, and that the combined data sets from all three experiments be used to produce high spatial and temporal resolution analyses for diagnostic studies and numerical modelling. The combined observations collected (approximately 99%) have been distributed to SPECTRUM and other participants in the form of magnetic tapes.

Prof. Elsberry planned to distribute the TCM-90 final analyses for the second phase of TCM-90 (1-20 September 1990) in early 1992 for use by SPECTRUM and other researchers.

An informal meeting of SRCG, presided by its Chairman, Mr. H. Ohnishi, was held on the penultimate day of the Guangzhou conference. The meeting tackled the transfer of SPECTRUM data sets to the Members; the progress made to promote interest among researchers in utilizing SPECTRUM data for tropical cyclone research; and prospective opportunities for closer coordination with other bodies in three future events: the ICSU/WMO International Symposium in Beijing in October 1992, IAMAP/IAHS Joint International Meeting in Japan in July 1993 and the IWTC-III in Mexico in late 1993.

Among the recommendations brought up in the meeting were:

*TC should consider establishing short/long term coordinated research and development programs to realize the benefits of the SPECTRUM data set;

*WMO should be invited for possible financial support for coordinating SPECTRUM-related research with other bodies;

*TC members should be encouraged the use of WMO fellowship funding for meteorologists' advanced training.

The meeting also discovered the common difficulty of reading the magnetic tapes from both the SPECTRUM and TCM-90. The Chairman volunteered to prepare another set of tapes using 1024 bytes per block in ASCII code and to make them available.

Chinese Experts on TCDC Mission

As part of their roving mission to some TC member countries in order to assess their needs and requirements for further technical assistance through TCDC, a team of Chinese experts visited PAGASA from January 18 to 22, 1992. The members of the group were Messrs. Wang Caifang, Division Chief of Foreign Affairs Department, Fang Weimo, Deputy Division Chief of Weather Forecasting and Warning Department and Li Xiaoquan, Deputy Director of Central Weather Office, of the State Meteorological Administration (SMA).

Realizing the importance of the mission in cognizance of the fact that it had benefitted from similar missions in the past, PAGASA made sure the visit would be as fruitful and memorable. Dr. Kintanar, with the full complement of his deputy directors Mr. C. Ferraris, Dr. L. Amadore and Mrs. M.L. S. Ceniza-Mijares-and other officials who had travelled to China were on hand to meet and reacquiant with the Chinese visitors.

An elaborate schedule was prepared for the Manila mission which included a whole-day field trip to several provinces in Luzon like Bacolor town and the abandoned U.S. Clark Air Force Base in Pampanga to see the devastation of Mt. Pinatubo's eruption. Also visited were the stations in Munoz (agromet) and Cabanatuan City (synoptic) in Nueva Ecija. They were also brought to the newly constructed Data Information Center (DIC) in Quezon City and in some tourist spots in the city.

In the discussion proper, the Chinese officials were briefed on PAGASA's organization and functions, the various aspects of work being done and the problems and difficulties that could be potential grounds for technical assistance.

(Turn to page 5)

3rd SPECTRUM Technical Conference in China

China had announced during the First Joint Session of PTC and TC in Pattaya, Thailand (February 1992) that it would like to host the third (misquoted as 2nd) Technical Conference on SPECTRUM by the end of 1993.

The first of such series of post-SPECTRUM technical conference – "SPECTRUM Technical Conference and Steering Group Evaluation Meeting"–was hosted by the Japan Meteorological Agency in Tokyo in December 1990. The second one–"Technical Conference on SPECTRUM"–was hosted by the State Meteorological Administration of China in Guangzhou, in November 1991.

China is also organizing the hosting of the Training Course on the Analysis and Forecast of Tropical Cyclones scheduled for 1993, which would be open to the members of the Typhoon Committee and the Panel on Tropical Cyclones. In addition, China has offered to host a co-operative research with experts from TC Members in 1992, as preparation to said third technical conference on SPECTRUM in late 1993, intended to strengthen the the technical cooperation among developing countries, and scientific research on tropical cyclones following the activities of SPECTRUM.

Furthermore, China has suggested to WMO a co-sponsorship of a seminar on Tropical Cyclone Forecasting and Research in Nanjing, China, from 27 October to 7 November 1992, which consists of two parts: training courses and research on the basis of SPECTRUM.

In a related development, Viet Nam has offered its Tropical Meteorology and Tropical Cyclones Research Center for members who may be interested to work there and avail themselves of its facilities and data gathered over the years from aircraft and ships in the South China Sea.

CHINESE EXPERTS...

(*From page 4*)

On their part, the visitors presented their views and concerns and the areas in which they could be of help, especially in typhoon forecasting and other facet of meteorological works where SMA and PAGASA share common interests.

The list of priorities discussed as PAGASA's TCDC requirements with SMA were as follows:

1) acquisition of streamline software
2) application of remote sensing technique in forecasting
3) satellite hardware
4) exchange in technology and rainfall forecasting
5) statistical method through spectral analysis
6) manufacture of meteorological balloons
7) establishment of market outlets of meteorological equipment and
8) establishment of data collection platform (DCP)

From Manila, the Chinese team was to fly to the cities of Kuala Lumpur, Bangkok and Hanoi to complete their mission.

Dr. Roman Kintanar (third from right), Director of PAGASA, poses with Chinese officials—Fang Weimo, Wang Caifang (2nd & 3rd from left) and Li Xiaoquan (2nd from right). With him are (left to right) Leoncio Amadore, Cipriano Ferraris and Ma. Lourdes Ceniza-Mijares, all Deputy Directors of PAGASA, with Eugenio Aquino, OD Staff Chief (right).

In their trip to Cabanatuan agromet station, guided by TCS Meteorologist G. Monroy (far right), FOC Chief C. Doctor (center), OD Staff Chief E. Aquino (second from left) and TCS secretary Citas Punsalan.

Second phase-flood forecasting project inaugurated

Former Philippine President Corazon Aquino inaugurates FFWSDO II.

The second phase of the Flood Forecasting and Warning System for Dam Operation (FFWSDO), a P822-million project funded by the Japanese government through the Overseas Economic Cooperation Fund (OECF) and the Japan International Cooperation Agency (JICA), was formally opened on March 11, 1992, in simple ceremony by former Philippine President Corazon Aquino.

Located in Diliman, Quezon City, the project was designed to reduce damage caused by innundation and other flood-related disasters. The new warning system will help ensure the safety of people living in the downstreams of the Binga-Ambuklao Dam in Benguet and the Magat Dam in Isabela, both in Luzon Province, Philippines, particularly during typhoons, by forewarning the residents of imminent overflowing of water from rivers flowing into said dams.

Under the FFWSDO Phase II, the Data Information Center of PAGASA can swiftly process and analyze information from its field observing stations and issue regular forecasts of the water level to the National Power Corporation (NAPOCOR) and the National Irrigation Administration (NIA). These two local agencies will then inform residents on when water will be released from the dams so the people can immediately take precautions.

The first phase of FFWSDO project, covering Angat Dam in Bulacan and the Pantabangan Dam in Nueva Ecija, was put in operation in 1986.

A telemetering system records the amount of rainfall and relies on water level gauging stations to determine the height of water in the dams and its river tributaries.

(*Turn to page 10*)

THAILAND

TMD marks 50th year

The Thai Meteorological Department (TMD) celebrated their Meteorological Service's 50th year anniversary, on 23 June 1992, which coincided with the inauguration of its new headquarters building.

Her Royal Highness Princess Mahachakri Sirindhorn graced the occasion where she unveiled a plaque commemorating the formal opening of the new TMD office building.

Princess Sirindhorn met with meteorological officers led by Mr. Smith Tumsaroch, Director-General of TMD, and was briefed on the use of state-of-the-art satellites and computers in weather and climate predictions—the present component at all levels of modern meteorological and hydrological prediction systems.

Exhibits were also organized during the observance of the anniversary.

HRH Princess Mahachakri Sirindhorn talks with meteorological officers headed by Director-General Smith Tumsaroch (center) at the opening of the new TMD building.

TMD weather specialists show Princess Sirindhorn the use of computers in modern meteorological and hydrological prediction systems.

Thai Weather Services Improve

The Meteorological Department of Thailand (TMD) continues to upgrade its facilities. Additional meteorological radars are being installed with more coming for 1993.

In meteorological satellite, four new high receiving systems for receiving GSM and NOAA imageries are being purchased for installation in each four Regional Meteorological Centers. It is hoped that in 1993, the imageries of both satellite and radars from the 4 regional centers will be linked with the data center of the Meteorological Department as well as the workstation of the Aeronautical Meteorological Division at the Bangkok International Airport.

The networks of Automatic Weather Observation System (AWOS) and Wind Shear Alert System (WSAS) have been improved with a number of completed installations in various domestic airports in Thailand. In addition, two sets of automatic radiotheodolite have been installed in two of each synoptic stations.

Annual Maximum Rain of Short Durations

Author Sudaporn Nimma of Thailand Meteorological Department reported his successful application of the Gumbel distribution to the study of annual maximum rain of short durations (1/4, 1/2, 3/4, 1, 2, 3, 6, 12 & 24 hours) for eight gauging stations distributed over Thailand. The stations are Chiang Mai, Phitsanulok, Nakhon Sawan, Nakhon Ratchasima, Chanthaburi, Aranyaprathet, Chumphon and Songkhla. The parameters are estimated by method of moments, method of maximum likelihood, and method of probability-weighted moments, separately. Gumbel distribution fitted by each method is found to be comparable and applicable as indicated by Kolmogorov-Smirnov goodness-of-fit tests. Results from the analysis and the relationship among rainfall depth, duration, and frequency (or return period) for each station are available in its printed report.

HONGKONG

Applying ECMWF Model to Typhoon Forecasting

A meteorologist of the Royal Observatory spent six weeks at the European Centre for Medium-Range Weather Forecasts (ECMWF) in spring 1992, looking into the performance of the operational ECMWF model in typhoon track forecasting over the western North Pacific. A positive impact on the short-range forecasts due to the enhanced observations collected by the SPECTRUM field experiment and the others (TCM-90 and TYPHOON-90) during August and September 1990 was found. Results also indicated that the high resolution T213 model with 31 levels implemented by ECMWF in September 1991 gave better typhoon forecasts than the previous T106 19-level system.

Pilot Real-time Flood Forecasting Scheme

In parallel with the development of flood basin management programmes, a pilot real-time flood forecasting scheme covering a selected basin about 70 square kilometers in area was introduced in the rainy season of 1992. The operation was based on eight raingauges and six river stage gauges which communicate data at five-minute intervals to a central station. A numerical flood model was run to provide short-range forecasts of water level a few hours ahead. The performance of the system will be reviewed at the end of the year.

Reaching Out to Schools

Hong Kong has not experienced a direct hit by a typhoon since 1983. In a bid to enhance the awareness of the younger generation to the potential dangers that typhoons could bring, a roving exhibition on "TYPHOON" was created for secondary school students by the Royal Observatory in late 1991. The exhibits consisted of display panels on various aspects of tropical cyclones and a 3-dimensional model of the air flow pattern inside a typhoon. It hoped to promote among the students a better appreciation of how the devastating forces of tropical cyclones could affect them and how they should respond to the warning signals. The exhibition has visited some forty schools, spending a week at each of them, and has been seen by about 20,000 students. Its tour of schools is continuing.

Secondary school students view roving TYPHOON exhibits by the Royal Observatory Hong Kong.

VIETNAM

Flash Floods Pose Threat

The threat of flash floods as disastrous as those that occurred in streams Laichau (June 1990) and Sonla (July 1991) which caused serious loses in lives and properties remains a problem in Viet Nam.

Flash flood consequences due to human activities have affected the basin ecosystem in Viet Nam. At present, most of its upper basin have less than 23% forest area.

Namlay Basin in one of the upper basins of Da River, with an area of 409 km^2 and length of 44 km, has suffered from serious deforestation since 1975 with its forest area reduced from 10% to 6% of the total area.

Human activities the past 20-30 years, such as urbanization, animal tending, forest exploitation and clearing of basin slopes for cultivation, have brought drastic change to the environment and caused hydrological conditions to deteriorate in the basin. In Namlay Basin, these activities have led to changes in flood forming mechanism, especially in higher flood peaks; shorter time of concentration; mechanism, especially in higher flood peaks; shorter time of concentration; raising coefficient of flow and the erosion of the basin. In Viet Nam, based on the natural structure of soil, floods are mainly formed by the mechanism of saturation flow. At present, the affected surface of the basin had turned into an over infiltrated runoff.

To counter the threat of flash floods, particularly to the people living in the basin, the Hydrometeorological Service is heightening its efforts in research and activities and the establishment of a flash flood warning system. Real time automated local observation and weather information are also needed because of the difficulty being encountered in flash floods forecasting.

JAPAN

RSMC Tokyo-Typhoon Center Revises Products

The RSMC Tokyo-Typhoon Center, effective on 1 July 1992, implemented amendments to the operational products (advisory for analysis, advisory for forecast, prognostic reasoning, guidance for forecast by numerical typhoon model and SAREP) disseminated through the GTS as follows:

* Advisory for Analysis and Advisory for Forecast were integrated into Tropical Cyclone Advisory;
* Tropical cyclones which are expected to reach TS intensity within 24 hours in the area of responsibility of the Center and/or tropical cyclone of TS intensity or higher that is expected to move into the area, are covered by these products as well. Abbreviated headings were newly allocated for the products and their code forms were modified in this respect;
* GTS transmission time for these products have been moved about 90 minutes earlier than previously done since 10 March 1992.

Detailed description of these changes were forwarded to all the members of the Typhoon Committee by mail and through the GTS.

As part of its continuing comprehensive effort to strengthen its services on both the operational and non-operational bases, the RSMC Tokyo-Typhoon Center has published and distributed to TC Members the publications "Tropical Cyclone Tracts in the Western North Pacific (1951-1990)" and "Annual Report on Activities of the RSMC Tokyo-Typhoon Center (1990)".

Nitta is JMA's New Director-General

Dr. Takashi Nitta was designated Director-General of the Japan Meteorological Agency (JMA) on 1 April 1992, succeeding Dr. Ryozo Tatehira. He is presently the Chairman of the Typhoon Committee.

Dr. Nitta (above, JMA Director-General, hopes to receive from TC Members the same warm support as Dr. Tatehira, his predecessor, had enjoyed.

Dr. Nitta rose from the ranks at the JMA, starting his career in 1955 at the Osaka District Meteorological Observatory. He held various key positions in the numerical weather prediction division (1959-1980). Thereafter, he became director and counsellor of several divisions and departments (1980-1986). Before

(Turn to page 9)

Kibria Retires

Mr. S.A.M.S. Kibria retired from the service of the United Nations as Executive Secretary of the Economic and Social Commission for Asia and the Pacific (ESCAP), in which capacity he had served since May 1981, and as the Special Representative of the Secretary-General for Coordination of Cambodian Humanitarian Assistance Programmes, a position entrusted to him by the Secretary-General in March 1987. It had been his privilege and honour to serve the countries of the region in these capacities.

As he bade farewell, Mr. Kibria expressed his deep appreciation and gratitude to the Typhoon Committee for all the support and cooperation extended to him throughout his tenure of office.

He also expressed confidence that his successor would continue to benefit from the generous support of TC in the same manner.

Mr. Rafeeuddin Ahmed took over Mr. Kibria as ESCAP Executive Secretary on 1 April 1992.

In another development, Dr. R.A. de Guzman has assumed the responsibilities of Director of the Technical Cooperation Department of the World Meteorological Organization (WMO). The Technical Cooperation Department is the focal point at WMO in matters of technical assistance for developing countries.

Obasi Receives UP Doctorate Degree

Prof. G.O.P. Obasi, Secretary-General of the World Meteorological Organization (WMO), was conferred a Doctorate Degree, Honoris Causa, by the University of the Philippines during its graduation ceremonies, on 26 April 1992.

Prof. Obasi was among the guest personalities honored in a dinner party tendered by Dr. R. Kintanar, Coordinator of TCS.

Prof. G.O.P. Obasi (seated second from left) at the party, with CB Chief Dr. A. Jose (left) and Dr. and Mrs. Kintanar.

NITTA...

(From page 8)

landing in the top-most position of Director-General of JMA, he was Director-General of the Okinawa Meteorological Observatory (1988-1990) and JMA Forecast Department (1990-1992).

Dr. Nitta has vast professional experience in synoptic forecasting, numerical weather prediction and modernization of weather forecasting system. He was awarded the Okada Prize by the Japan Weather Association (1976) and Fujiwara Prize from the Meteorological Society of Japan (1982).

In research, his works included the 1) development of numerical weather prediction model for typhoon movement, with emphasis on the development and maintenance of relatively small scale cyclones, and technique of objective analysis and initialization for the primitive forecast equations and 2) numerical simulations of the development of the intermediate-scale cyclone in a moist model atmosphere, and synoptic scale atmospheric motion and the associated heat supplies from sea surface during AMTEX'74 period.

Dr. Nitta's involvement in WMO activities started as a senior scientific officer in the GARP Activities Office (1975-77). He went on to become a member of the Commission for Basic Systems (1986-88 & 1990-92) and Commission for Atmospheric Sciences (1983-86) simultaneous with several alternate memberships to the WMO Executive Council (1983-85) and lastly as participant in the Second World Climate Conference (1990).

Dr. Nitta is a product of the University of Tokyo, earning his BS.C in 1955 and Ph.D. in 1965. Born in Osaka, Japan, he is married to Michiko Nitta and is blessed with two kids Hiroko Yasuda and Shin Nitta.

EDITOR'S NOTE

I am very fortunate to have been a close acquaintance of Dr. Nitta on many occasions. I first met him in 1981 during the Preliminary Experiment of TOPEX as a seconded forecaster to the International Experiment Center (IEC) in JMA. This was followed by my 2nd and 3rd secondment to the IEC for the First and Second Operational Experiment in 1982 and 1983. Dr. Nitta was then the Director of Forecast Management Division (JMA). He was detailed by JMA at the IEC alongside Mr. I. Shimizu, then Director of Forecast Department and IEC for TOPEX.

The success story of TOPEX at IEC would not be complete without reference to the direct contribution of Dr. Nitta, not to mention his vital role as Coordinator of the Preparatory Committee.

Perhaps few know that Dr. Nitta is an expert in numerical weather prediction. His numerous technical papers in prominent journals and Ph.D. dissertation papers as well as authorship of several books in meteorology attest to this. He has very good command of oral and written English. I would describe him as a complete supervisor owing to his equal adeptness to operational, research, academic and administrative experience.

Steklov Visits TCS

TCS staff-members, led by Dr. Kintanar (left), welcome Mr. Y. Steklov (second from left).

Mr. Yuri Steklov, Economic Affairs Officer of the Water Resources Section/ Natural Resources Division of the ESCAP Secretariat, arrived in Manila on 14 June 1992 for a 5-day mission to collect information on water resources of the Philippines and their use by various economic sectors.

Mr. Steklov had asked for assistance from the Typhoon Committee Secretariat on his mission. Most of the required information was taken from the National Water Resources Board of the Department of Public Works and Highways (DPWH), the counterpart of the visitor, and the Metropolitan Waterworks and Sewerage System (MWSS).

KOREA

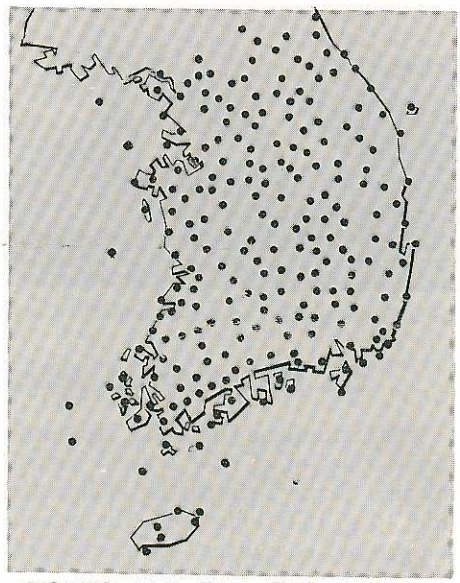
KMA expansion continues

A new division was established by the Korea Meteorological Administration (KMA), in March 1992, named the Climatic Applied Planning Division (CAPD) under the Applied Meteorology Bureau. It is in charge of atmospheric environmental business, such as climatic change caused by greenhouse gases and ozone depletion, and marine meteorology to support fishery, marine transportation and coastal developments. This reflects the Korean government's recognition of the growing importance of atmospheric environmental problem and global climate change.

Along with the CAPD, a greenhouse gas monitoring station was also established in Muan. The new station will monitor the concentration of carbon dioxide and report to the World Data Center for Greenhouse Gases in Tokyo.

In addition, two radar stations were also established at Donghae and Kunsan.

Rapid Progress in AWS Network Seen



248 AWSs dot the Korean Peninsula.

The KMA has set up 80 additional Automatic Weather Stations (AWS) in

(Turn to page 10)

248 AWS...

(From page 9)

1992, which brought to 248 the total number of AWS now in operation in Korea. This number gives about 23 Km spacing in the average. The AWSs make observation and provide information on wind, temperature, precipitation and humidity to forecasters every hour (or on-call base). The data are collected routinely by telecommunication network and analyzed on workstation to produce graphics on CRT monitor which are then disseminated to local forecast offices nationwide. The data will enhance the KMA's capacity to detect severe weather and issue proper warnings.

The expansion of AWS, targetted at a total of 400, will continue up to 1994.

RICOS Installed

The KMA has completed in 1992 a nationwide radar network composed of five C-band doppler radars with average spacing of 200 km between them. They are located in Seoul, Pusan, Cheju, Kunsan and Donghae. To optimize the operation of the network and to make easier the conduct of overall analysis of precipitation echo, the KMA also installed a Radar Image Composite System (RICOS) MC6450. The system can display the composite radar imagery of 1268 km x 1460 km area over Korea. Individual echo is transmitted to RICOS at Headquarters to composite the 5 echoes every 10 minutes. The composite radar echo imagery is then disseminated to local forecast offices by image telecommunication network on every 30-minute interval to support forecasters nationwide.

The composite imagery produced by RICOS every half-hour is distributed to all the meteorological stations. In 1992, RICOS successfully composited the precipitation area associated with the Changma (Baiu) front over a wide area. This composite imagery was used to analyze the behavior of the Changma front. Since July 1992, the KMA has been testing a precipitation nowcasting model using the composite imagery as the initial data. This model is providing a prediction up to 3 hours ahead of precipitation. The KMA expects the RICOS to successfully track typhoons as they approach the Korean Peninsula.

SECOND PHASE...

(From page 5)

A real time processing computer forecasts the inflow of flood water into the dams. Warning dissemination facilities and supervisory control stations in dam offices will help in relaying to the affected residents imminent flowing of the dams.

Through the FFWSDO, the Philippine government can undertake cost-effective operations of the major multi-purpose dams and reservoirs in Luzon. The equipment installed at the project are part of its disaster preparedness program which also includes the continuous upgrading of equipment and facilities for weather forecasting as well as for monitoring of volcanic activities and earthquakes.

Dr. J. Hickman (left) holds talks with Dr. Kintanar.

Dr. Hickman in WMO Consultancy Mission

WMO Consultant Dr. John S. Hickman, former Director of New Zealand Meteorological Service, visited the Philippines from 10 to 15 October 1991. His mission was part of a consultancy service arranged by UNDP under RAS/86/175 to assist Typhoon Committee Members in preparing a continued programme after the phase out of UNDP assistance in 1991. He had earlier visited Malaysia, Thailand and Viet Nam as part of his mission.

Dr. Hickman's overall objectives were to assess the status of the Members' warning systems including disaster prevention and preparedness (DPP) programmes and to assist the Members to prepare programmes on on-going works. He had linked these objectives with the six elements vital to the long-term objectives of WMO Tropical Cyclone Programme (TCP) and their relevance to the activities of the Typhoon Committee. These are:

- Detect, tract and forecast the approach and landfall of tropical cyclones and disturbances;
- Provide forecasts or timely assessments of heavy rainfall and strong winds resulting from tropical cyclones or incipient tropical cyclones;
- Apply the most appropriate techniques in quantitative storm-surge prediction;
- Forecast floods caused by tropical cyclones;
- Provide the basic data on risk of loss from wind,
- Provide the basic data on risk of loss from wind, storm surge, flood or landslip to meet the needs for development planning and other purposes;
- Organize and execute essential disaster prevention and preparedness measures, making use of meteorological and hydrological information and expertise.

Dr. Hickman also conferred with Dr. Kintanar of the Typhoon Committee Secretariat (TCS), PAGASA officials and representatives from the Office of Civil Defense, National Disaster Coordinating

(Turn to page 11)

The Summit to Save the Earth

World leaders and representatives from as many as 178 countries ended the **Earth Summit** in Rio de Janeiro (June 14) adopting a global plan designed to save the planet from humanity's devastation and pledging to do their utmost to prevent environmental ruin.

But as they left the meeting, described by the **UN** as the biggest gathering of heads of state and government, they were warned that the real work of racing to save the planet had only just begun.

Earth Summit Secretary-General Maurice Strong said in his final speech, "the real measure of our success will be in what happens when we leave. Will this summit merely be a high point in our expressions of good intentions and enthusiasm and excitement or will it really be the start of a process of fundamental change we absolutely need?"

The Earth Summit, formally known as the **United Nations Conference on Environment and Development (UNCED)**, opened June 3 at the RioCentro convention center. Thousand of delegates debated and negotiated pending issues facing the planet up to June 11 and an estimated 100 presidents, premiers and kings met on the final days.

The agreements reached at the 12-day conference were encapsulated in an 800-page document known as **AGENDA 21** – a huge blueprint for environmental change and ecologically wise development into the 21st century.

In addition, more than 150 of the countries had signed two conventions which would eventually become binding treaties. One aims to reduce emissions of "greenhouse gases" which help trap heat in the atmosphere and are believed a cause of global warming. The other a **biodiversity agreement** to protect the world's disappearing species of plants, animals, resources and even microbes.

The delegates also adopted a non-binding statement of principles to save forests, and an agreement to stop the spread of deserts.

Also adopted was a **Rio Declaration** which sets out 27 principles outlining human responsibility to the earth and developing nations, starting with a right to a healthy and productive life in harmony with nature.

Also completed was the creation of a new UN agency – the **Commission on Sustainable Development**, which will monitor the environmental actions around the world through periodic reports to be required from governments, international agencies and environmental groups.

UN Secretary General Boutros Boutros-Ghali had blamed both poor and rich nations for a sick planet. "At this juncture of catastrophic environmental disaster, their reverence for the imperatives of environment is obviously eroded by their recourse to political pressures," he said when he opened the summit.

Pakistani Environment Minister Anwar Saifullah Khan, who spoke for Third World countries in the Group of 77, complained bitterly of developed nations, which he said gave scant attention during summit preparatory meetings to the development concerns of developing Third World nations. Khan spoke of developed nations failing to act decisively despite "irrefutable scientific evidence for apocalyptic collapse of our planet." What is most unfortunate is the desire to perpetuate over-consumptive lifestyles that are substantially responsible for the degradation of environment and depletion of natural resources," he told the summit.

Environmentalist groups said much of the summit had failed to live up to expectations. The group Friends of the Earth claimed important progress but said leaders had failed to seize a historic chance to change the world.

The always thorny money issue: who will pay to clean up the environment, how much, when and to whom – was the touchstone for most disputes. Developing countries wanted industrialized nations to pay for the clean-up and protection, and allow recipient governments to decide how funds would be spent. The US had opposed the request and was partly responsible for its refusal to sign the biodiversity treaty to protect animals and plant species. The clean-up cost could top $125 billion a year.

Under the climate control pack, a declaration on global warming, which would set specific targets worldwide for the reduction of carbon dioxide emissions, was dropped after the US forced removal of that goal from the draft treaty for fear it could hurt US industries. The US had been harshly criticized for blocking far-reaching agreements on global warming. Because of US insistence, the draft treaty no longer included caps on carbon dioxide emissions belived to be the main cause of global warming. Instead the US had suggested that each country develop its own emissions reduction measures. The US alone produces almost one quarter of the carbon dioxide emissions worldwide each year. The European Community nations, acting in unison, pledged to reduce their own "greenhouse gases" emissions to 1990 levels by 2000.

The Earth Summit ended as the delegations of 178 nations roared away from Rio in an ironic swirl of exhaust fumes after agreeing to a compromise environmental plan criticized by many as lacking teeth but which raised consciousness worldwide.

Seen as the first major world gathering since the end of the Cold War, it signalled the beginning of the gargantuan task of making up for centuries of environmental destruction and degradation in the quest to win the Green War.

Beyond the successes that the Rio Summit hopes to attain, each one must contribute to the global effort by making the necessary personal changes, and by actively participating in the earth movement to save planet Earth. It is now or never and only through collective action can we hope to attain an environmentally sound and sustainable future for all mankind.

DR. HICKMAN...

(From page 10)

Council and Department of Social Welfare and Development.

The agencies made presentations to Dr. Hickman to provide him with an overview of national programmes and activities. These briefings were followed by detailed discussions covering a wide range of topics which opened to scrutiny such questions as: the working relationship and coordination between the agencies concerned, the acceptability of PAGASA warnings to these agencies, their respective programmes for improvement especially as regard their input to long-term developments, preparations before the typhoon season and their needs for assistance, TCDC and the necessity of UNDP support.

From Manila, Dr. Hickman was scheduled to visit Hong Kong, China and Korea before going back to Geneva to complete his mission report.

Pinatubo Int'l Conference Tackles Lahar Disaster Prevention

A three-day International Scientific Conference on Mt. Pinatubo, held at the Department of Foreign Affairs in Manila (27-29 May 1992), focused on exchanges in scientific information and experiences in disaster management during volcanic eruptions. Participants included representatives from the United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Development Programme (UNDP), Commission of the European Communities (CEC) and the Philippine government.

The conference issued a joint declaration recommending that the Philippine government harness its resources and work with the private sector to meet any Mt. Pinatubo related-eventualities that may arise in the future. It stressed that the Pinatubo volcanic eruption is a unique example of what may be called a "lingering disaster", a phenomenon which accentuated the need for a broader strategy of disaster preparedness and mitigation and its full integration into the national development plans of the Philippines.

It added that subregional, regional and international cooperation both on the government and non-governmental levels on disaster mitigation should take fully into account "lingering disasters" and consider forging closer linkage between assistance for development and assistance in disaster relief rehabilitation and mitigation.

The conference also recommended that a study of the global effects of the Mt. Pinatubo eruption, in relation to climate change and the ozone layer, be undertaken by Filipino scientists with their counterparts from other countries. The participants noted that there was not enough information disseminated regarding the force and magnitude of the eruption and the actual destructive effects which exceeded the initially-identified areas to be affected. It was proposed that the eruption and its effects be appropriately considered as a topic in the UN Conference on Environment and Development (UNCED) in Brazil.

Mt. Pinatubo erupted in June 1991 after centuries of dormancy which scientists said among the biggest eruptions of this century and is expected to reduce the global warming trend because of the heavy amount of debris, dust and chemicals hurled into the atmosphere.

A recent report by the National Oceanic and Atmospheric Administration (NOAA) said the eruption cooled temperatures on Earth by an average 1.0 degree Fahrenheit (0.56 degrees Celsius). The drop in temperature was recorded between June 16, 1991, when the volcanic eruption occurred, and May of this year. Ellsworth Dutton of the NOAA's Climate Monitoring and Diagnostics Laboratory in Boulder, Colorado, said that it was a tremendous amount of cooling and if it became a little more would essentially be equal to what was considered the global warming of the last century or so. The total amount of solar energy reaching the Earth's surface was diminished by a layer of sulfuric acid droplets released by the volcano. Most of the globe cooled although some areas were warmer than others, according to calculations based on measurements made by microwave sensors aboard NOAA satellites. In the northern hemisphere, where the volcano is located, average temperatures fell 1.5 degrees Fahrenheit (0.83 degrees Celsius). Sulfur dioxide from the volcano formed a layer of acid about 19 to 22 kilometers (12 to 14 miles) above the Earth's surface, according to Dutton.

Although the volcano has not erupted in months, tons of volcanic debris remain on the slopes and the threat of avalanches is expected to remain for several years. A recent study conducted by the United States Geological Survey (USGS) said some 1.2 billion to 3.6 billion cubic meters of lahar from the volcano will bury vast areas of Central Luzon in the next 10 years, and some 300 to 500 million cubic meters of volcanic sediment are expected to descend from the volcano with the onset of the rainy season in June.

In response to the request for help from the Philippine government, the United States Agency for International Development (USAID) had agreed to finance an extensive six-million-dollar (P160 million) study of the lahar threat and asked the U.S. Army Corps. of Engineers (USACE) to undertake major mapping operations and assessment of situation in the Central Luzon area and to propose solutions to minimize damage caused by floods and mudflows. The USACE had dealt with a similar situation after St. Helens erupted in Washington State in 1980.

In the face of feared lahar devastation, local officials here had urged the government to construct more permanent dams across dangerous lahar channels in Central Luzon, in addition to several "sabo" containment dams already finished or being rushed. A total of six newly built multi-million-peso sabo dams had been destroyed during a series of lahar flows triggered by heavy monsoon rains, exposing villagers to the danger of being swamped by lahar. Three of these dams were located across the Porac-Gumain river (P12 million), Abacan river (P7 million) and in Porac-Hacienda Dolores (P10 million). However, the foundations of the damaged sabo dams were still intact allowing repair work to be done. Most of the other sabo dams that were built earlier were already filled by lahar following recent rains and could also overflow and collapsed. Government engineers had warned earlier that some of these sabo or check dams built in upper and middle reaches of various rivers in Central Luzon were defective as they lacked a concrete foundation. The Department of Public Works and Highways (DPWH) said that these man-made containment dams would not be able to hold completely the occurring lahar flows. The dams, patterned after a Japanese prototype, made of piled-up rocks wrapped in galvanized or meshed steel wire, were built to contain volcanic debris and lessen the impact of lahar downstream. Plans to build additional sabo dams were being abandoned with the rainy season at hand, while some residents had opposed their construction in their areas for fear that the accumulation of lahar deposits would increase the lahar threat. Despite these, DPWH had recognized the important role of sabo dams being temporary structures

(Turn to page 13)

EARTH DAY FETE

Centers on Environmental Concern

From Manila to Budapest and across the United States, the world celebrated Earth Day (22 April) with tree plantings, street marches and campaigns, calling on people to sacrifice to preserve the threatened environment. As the UN Earth Summit in Rio de Janeiro in June neared, there was growing concern that time to tackle dangers facing the planet earth, due to human abuses and excesses, is running. out. The environmental commissioner of the European Community (EC) had warned ahead that the Earth Summit was "doomed to failure and our planet with it, unless world leaders move beyond breast-beating to concrete steps against global warming.

"There Are No Spare Parts For A Worn-Out World", warned placards waved by marchers in Manila, while the Earth Savers Movement distributed 10,000 lung-savers masks to city policemen, jeepney drivers and vendors. If things continue as they are, the air pollution can make the city of Manila totally unfit for human habitation.

The observance of Earth Day in the Philippines was centered on the country's most pressing environmental concern which is deforestation. The Department of Environment and Natural Resources (DENR) issued Administrative Order No. 24 imposing a total ban on logging operations in all virgin forests. From the Order evolved the "Save the Virgin Forests Program" which is essentially aimed at conserving and preserving the remaining virgin forests for environmental stability in politically, socially and culturally acceptable ways.

In the Philippine House of Representatives, some 130 young scientists from all over the nation convened the First National Youth Congress and formally ratified the Philippine Environmental Youth Charter to be presented at the Earth Summit. The Charter contains key policy recommendations from the youth sector on the issues of deforestation, atmospheric pollution, and solid waste management.

Disaster Management Featured in MAC 5

The Fifth Meeting of Aid Coordinators (MAC 5), organized by UNDP and hosted by the Philippine Government, was held at the Manila Hotel, in Manila, from 20-23 January 1992.

Development assistance coordinators from governments in Asia and the Pacific region participated in MAC 5, with representatives of bilateral donor countries, senior officials of UN agencies and senior UNDP staff, including all the Resident Representatives in the region also in attendance.

MAC 5 was the culmination of a long and thorough consultative process participated in by senior representatives of the region, universities and regional institutions, UN agencies and the Asian Development Bank (ADB), through a number of intergovernmental meetings at

(Turn to page 14)

1st JOINT SESSION... *(From page 2)*

the high seas. Japan had signified its intention to implement the system on an operational basis starting August 1992 after consultation with Hong Kong and other WMO members. Concerns over the cost of transmissions by issuing services and on the need for clarification of funding mechanisms within the GMDSS were brought up in this respect.

On the issue of the standardization of nomenclature used in the classification of tropical cyclones in all five regional tropical cyclone areas, the session agreed to have it further considered and carefully analyzed during the RSMC Technical Coordination Meeting on Operational Tropical Cyclone Forecasting and Dissemination of Results in late 1992. The outcome of that meeting will be made available to the Tropical Cyclone Programme regional bodies and the WMO Technical Commissions and Regional Associations for their considerations after which their proposals regarding recommended standardized terminology will be formulated on a global basis.

The session also welcomed the invitation by the WMO Secretariat for all members of the regional tropical cyclone bodies to have their flood forecasting systems monitored through the new Management Overview of Flood Forecasting Systems (MOFFS) rating system. The use of MOFFS would greatly facilitate the exchange of experience on flood forecasting among the various regions.

The Typhoon Committee Natural Disaster Prevention Award was not given this time as the Meteorological Department of Thailand failed to come up with their winners.

While a decision was reached on having China as the site for the twenty fifth session of the Typhoon Committee in Decem-1992, hopes were expressed that another joint session would materialized in the near future.

PINATUBO... *(From page 12)*

serving as the first line of defense against lahar and functioning primarily to slow down its velocity, thereby reducing its destructiveness. However, the DPWH said that the dams would last for only two to three rainy seasons although they are repairable and easy to construct.

Also being rushed are the dredging, channeling, desilting and strengthening of affected rivers; construction of dikes in Sto. Tomas river to guide and divert the lahar to flow directly to the South China Sea; and elevating of roads to serve as a ring dike against lahar flows. The lahar threat is compounded by the silting of the eight river basins draining Mt. Pinatubo, which was the main cause of widespread flooding after the eruption.

The National Disaster Coordinating Center (NDCC) said warning systems have been reactivated in the expected paths of lahar. A multi-agency lahar early warning system had been set up where PAGASA would be among the agencies involved. Evacuation centers, NDCC added, had also been set up in areas around the volcano to accommodate Filipinos fleeing areas threatened by mudflows.

DISASTER... *(From page 13)*

the sub-regional level in the Pacific, ASEAN, Northeast Asia and IndoChina.

MAC 5 centered on regional and sub-regional cooperation in Asia and the Pacific Region and the role of UNDP in promoting regional cooperation. It reviewed and endorsed the 5th Inter-Country Programme (ICP 5) for Asia and the Pacific (1992-1996) for submission to the UNDP Governing Council for final approval in mid 1992. The Development Coordinators from all the attending Governments made further comments on the ICP 5-draft's seven principal features:

* a clear focus on three major development themes: human development; economic reform and management; and environment and natural resource management;
* articulation of these themes into a limited number of distinct programme areas of practical intervention within which proposals have been received from Governments, regional institutions and UN Agencies;
* greater emphasis on sub-regional programmes, and programmes involving smaller groups of countries;
* closer linkages with country programmes and the encouragement of more co-financing between regional and country IPFs;
* the expansion of cost-sharing with other donors in order to enhance the impact of individual programmes and foster better coordination;
* the adoption of the "programmatic" approach to technical cooperation emphasizing holistic considerations and incorporating greater flexibility and responsiveness to specific country needs;
* more decentralized programme management and the involvement of more regional institutions in programme implementation.

The meeting also considered programme and operational matters pertaining to UNDP assistance, including priority themes, programme approach, national execution, successor arrangements for agency support costs and other recent initiatives.

As a special feature of the Meeting was the designation of its third day as "MAC 5 Disaster Management Day." At Meeting II of MAC 5, the impact of disasters on development was extensively discussed. Specifically, the essential factors that should be taken into consideration in the preparation of national development plans, in the light of natural disaster threats, were presented.

A briefing on the Philippine Government's Rehabilitation Programme was also featured. Delegates from other disaster-affected countries briefed meeting participants on: What lessons were learned which might be applicable to other countries? and, What needs to be done next and how? In the case of the Philippines, the Mt. Pinatubo volcano eruption served as a case study.

One highlight of the MAC 5 Disaster Management Day was a field trip by MAC 5 participants to and from areas affected by the Pinatubo eruption. an open forum on disaster and development in Asia and the Pacific capped the day's activity.

Among the MAC 5 participants were WMO representatives Dr. Ekkri Jatila, Director of Technical Cooperation Department and Messrs. Keming Zhou, Programme Officer of TCD and Ho Tong Yuen, Regional Director for Asia and Pacific and Dr. Roman Kintanar, Permanent Representative of the Philippines with WMO.

Dr. Jatila said here that Asia-Pacific countries should try to develop cleaner and safer sources of energy like those harnessed from the sun (solar) and the wind which are plentiful in the region to replace present sources which pollute the environment and lead to global warming. He stressed that Asia contributes to the build-up of the so-called "greenhouse gases' largely through the methane emissions of rice fields which abound in the rice-eating parts of the region.

More than 90 percent of the world's rice is grown and consumed in Asia, according to the Philippine-based International Rice Research Institute (IRRI).

Jatila said the climate in Asia would definitely be warmer in the future and that global warming and climate change would have regional impact which may be very harmful but added that it was still difficult to predict for sure how the rainfall patterns will change, as well as the frequency and intensity of cyclones and typhoons.

On the global effect of Mt. Pinatubo, Jatila said that while its eruption may have cooled the Earth's atmosphere a bit by blocking sunlight, the effect would wear off in a few years' time and the environment will heat up again.

Asia-Pacific Conference on Global Warning and Climate Change

World environmental experts and scientists attended a 3-day multi-disciplinary Asia-Pacific Conference in Quezon City, in November 1991, aimed to inform key decision-makers, senior professionals, academicians, leaders of organizations of both the private and public sectors about the implications of global warming and climate change for possible response strategies in conjunction with the biennial Congress of the Earth Savers Movement.

The global climate change summit-briefing was organized by the Philippine Senate and House Committee on Natural Resources and Ecology in coordination with Dr. Ata Qureshi, Project Director of the International Climate Institute in Washington, D.C. Among those invited as members of the Steering Committee which oversaw the summit were Dr. Kintanar, PAGASA Director and Dr. Solis of the National Mapping Research and Information Administration (NAMRIA).

Through the support of the Intergovernmental Panel on Climate Change of the United Nations Environmental Programme (UNEP), experts from CSIRO Australia on Atmospheric science, from the New Zealand Ministry of Environment on Coastal Issues and Energy Response Strategies, and from the US National Aeronautic and Space Administration's Goddard Institute for Space

(Turn to page 15)

ASIA-PACIFIC... *(From page 14)*

Studies, discussed the implications of Mt. Pinatubo for global climate and the El Nino Southern Oscillation phenomenon as well as other topics in relation to global warming and climate change.

The UNEP, alarmed by global climate change, issued a statement that "if we do not act soon to reduce emissions, the best we can expect is that within the century, the world will be warmer than at any other time since the start of agricultural civilization, six thousand years ago.

Global warming, which refers to the increase in the weather's temperature worldwide, is caused by the large-scale burning of fossil fuels like oil and coal, the release of chlorofluorocarbons into the air, and massive deforestation.

The increased amount and heavy concentration of greenhouse gases (carbon dioxide) now cloaking the atmosphere has led to the rapid warming of the planet. The earth is now 0.5 degrees Celcius warmer. If the trend continues, it will be 3 degrees hotter by the end of the following century. This means that unless the trend is reversed, the world will be much warmer than it has ever been at the start of the agricultural revolution, 10,000 years ago, than in pre-industrial times, scientific studies show. The industrial revolution is only 300 years old.

Among the effects of global warming include increased disturbances in the world's weather systems, which include more frequent and stronger storms even in areas which have never experienced severe storms.

Studies also showed that the increase in temperature will cause oceans to warm and expand, raising sea levels which could in turn flood many of the world's deltaic areas like Bangladesh, Egypt, Indonesia and India.

Dr. Qureshi said the increased spate of weather disturbances indicates weather changes are occurring. However, the adverse effects of global warming can still be reduced, he added.

Reforestation, for instance, can reverse the local environmental degradation and stabilize the soils to preserve the productivity of land. Switching to energy sources not utilizing fossil fuels, such as geothermal energy, is another alternative, he said.

Dr. Solis said the water level in Manila Bay has risen by some 30 centimeters since 1947.

If nothing is done worldwide to counter the effects of global warming, the water level may increase by 60 cms. by the year 2030, Solis said.

Dr. Kintanar attributed the increase in typhoons and their intensity to the emerging global warming phenomenon which traps the earth's heat within the atmosphere.

The Philippines has an average of 19 typhoons a year, but this has increased during the past years to over 20. Kintanar said wind speed has also reached 280 to 300 kilometers per hour similar to Typhoon Trining (Ruth) which destroyed Northern Luzon.

Dr. Chris Newhall, a volcanologist, said that no matter how extensive the environmental damage caused by the eruption of Mt. Pinatubo, it is very little compared to man-made destruction.

The destruction of 100,000 hectares of forest by the volcanic eruption is equivalent to one year's deforestation by loggers in the country, he said.

The estimated 100 billion kilograms of carbon dioxide spewed by the volcano is only about one percent of the carbon emissions by factories and vehicle exhausts, Newhall added.

Earlier, a forum entitled "Earth Summit 1992 and Climate Change: A Campaign for a Stable Atmosphere", hosted by the Haribon Foundation, was also held in Quezon City. It tackled the question of how to preempt the climate change problem and provide a backgrounder on the objectives of the United Nations Conference on Environment and Development (UNCED).

Sarker in Manila

Dr. R. P. Sarker, the Chief of Division for Asia and the Southwest-Pacific, Technical Cooperation Department, WMO, met with Mr. Abu Y.M. Selim, Permanent Representative a.i., UNDP, Manila, and Dr. Roman L. Kintanar, PAGASA Director and TCS Coordinator. He was in Manila as WMO representative to the UNDP/WMO Training/Workshop on Use of Agrometeorological Information to Agriculture, which was held from September 30 to October 11, 1991.

Dr. Sarker, in his talks with Dr Kintanar, clarified on the spending of unused funds left from the defunct project RAS/86/175 Programme Support to the Typhoon Committee for some TCDC requirements. Part of the funds had, in fact, been spent in financing the Study in Repair, Maintenance and Calibration of Basic Meteorological Instruments and Equipment offered by China for two experts each from the Philippines and Thailand. A trainee from Africa was accommodated in the training through WMO Voluntary Co-operation Programme (VCP). The training was held in Beijing, from 7-18 October 1991.

The TCS asked Dr. Sarker to reconsider and accommodate in 1991 the request from Lao PDR officials for its proposed requirement for the training on using AMSS in operation at the Thai Meteorological Department and the familiarization on flood forecasting using SSARR Model in Lower Mekong River Basin (Mekong Secretariat), in Thailand, from 9 to 20 December 1991. Lao PDR sent Messrs. Thongphou Vongsyprasom and Vongdara Keomuongchanh to the training.

TCS presented to Dr. Sarker the TCDC bilateral arrangement between Malaysia and China on the request for exchange visit of four Malaysian and Chinese flood experts for the purpose of mutual transfer and sharing of knowledge and experience in flood forecasting.

From Manila, Dr. Sarker proceeded to Nadi, Fiji, for the opening of the Workshop on Tropical Cyclone Forecasting, a UNDP/WMO project training in meteorology for manpower development in Southeast Asia and the South Pacific.

TC NEWSLETTER is a publication of the Typhoon Committee Secretariat, Manila, Philippines. The expressed opinions, scientific or otherwise, do not necessarily reflect those of the Committee. The Editor reserves the right to edit and will exert every effort to publish articles received. TC Members are enjoined to send their contributions. Articles must be of relevance to TC activities and should not exceed 1,500 words.

GABRIEL S. MONROY
Editor

HANNIBAL B. MARAYAG
Editor Assistant

FELICITAS C. PUNSALAN
Publication Officer

The devastating flash floods in Ormoc City last year that killed over 5,000 people.

Deadly Flood in Ormoc

by K. Yanagiya

In the morning of November 5, 1991, Tropical Storm Thelma (9125), domestically named Uring, triggered a heavy downpour in the province of Leyte, Southern Philippines, particularly, in Ormoc City. The heavy rainfall caused flash floods aggravated by the combination of floodwaters, debris and driftwoods. Consequently, thousands of residents of Ormoc City perished.

A team composed of experts from the Japan International Cooperation Agency (JICA), Typhoon Committee Secretariat (TCS) and the Department of Public Works and Highways (DPWH) was dispatched for four days from 7 to 10 January 1992, to conduct a site survey in the Island of Leyte.

Tropical Storm Thelma was a relatively small-sized tropical cyclone with a central atmospheric pressure of 992 mb and maximum winds of 20 to 21 m/s.

Thelma, however, had developed a strong cumulonimbus of up to 15,000 m in heights such as that of a big-sized typhoon. This cumulonimbus brought the intense rainfall to the mountainous area of 1,000 m in elevation which extended from northwest to the southeast in Leyte island.

From the records of a station in Tungonan, located in the mountainous area, 15km of Ormoc, an extremely intense rainfall was observed at 6-hour rainfall value of 580.5 mm. According to a field interview, the duration of rainfall may have been four hours to surmise that extraordinary heavy rain such as 150 mm/hr had fallen for four hours in the mountainous area.

On the watershed profile of the area, a survey was made on the Anilao and Malbasag river basins, both of which drain out to the Ormoc Bay through a common flood plain which is Ormoc City. The urbanized area of Ormoc City is relatively flat with a maximum relief of about 3.0 m, and approximately 2.0 km^2 area of low land is subject to flooding. Anilao river has a watershed area of 26.5 km^2, and Malbasag river has 12.1 km^2.

Along these channels, retaining wall, stone masonry revetment or concrete channel were constructed at important spots in the urbanized area in Ormoc City.

On the land use, the woodlands which consist of forest residentual species are confined in the highest portion of the mountains, mainly at the peak.

The losses suffered in Ormoc City are given in the table below:

Item	Unit	Total
Casualties, Deaths	persons	4,922
Missing	–do–	3,000
Houses, Collapsed	houses	2,850
Partially Collapsed	–do–	10,910
Commercial Stores and Properties	Million Pesos	49.0
Livestock	Million Pesos	6.0
Crops	hectare	3,800
	Million Pesos	43.0
Fishery	Million Pesos	0.9
Infrastructures	Million Pesos	286.0
Flood Control and Seawall	–do–	188.0
Bridges	–do–	48.0

Source: Ormoc City Hall

Studies showed that the following factors have caused the flood disaster:

* the unusually high and intense rainfall concentration;
* accelerated energy of the flood flow with driftwood and landslide debris;
* insufficient drainage capacity of the Anilao and Malbasag rivers;
* unsuitable channel alignment (river bend is almost 90°) upstream of the Anilao river and swelling of the flood water by this bridge.

The possibility of the tragedy repeating in the future is not remote, and to prevent this from happening, several proposals were raised such as:

* the urgent implementation of flood control improvement works as protection against impending floods in coming rainy seasons, such as dike reconstruction and channeling of sections;
* implementation of comprehensive flood control projects such as the watershed management project including reforestation, reconstruction of bridges and land treatment measures; sabo projects including the construction of sediment and driftwood control dams and river training works in the upper reaches;
* coastal protection project including seawall constructions;
* flood plain management project including the resettlement of squatters in the floodway and land acquisition for public use.