NATIONAL REPORT ON IHP RELATED ACTIVITIES
MYANMAR

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1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2014 - MAY 2016

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

The Myanmar National Committee for IHP (MNC-IHP) has been organized on 24 March 2003 comprising a Chairman, a Vice Chairman, a Secretary and (17) members from 8 Ministries and 2 City Development Committees. The present composition of MNC-IHP is as follow;

Chairman: Minister for Transport
Vice Chairman: Deputy Minister for Transport
Secretary: Director General of Department of Meteorology and Hydrology
Members: Representatives from departments and committees concerned are as follows;

1. Deputy Minister for the Ministry of Science and Technology
2. Deputy Minister for the Ministry of Agriculture and Irrigation
3. Director General of the Directorate of Water Resources and Improvement of River System
4. Professor of Civil Engineering Department, Yangon Institute of Technology
5. Professor of Civil Engineering Department, Mandalay Institute of Technology
6. Director General of the Irrigation Department
7. Director General of the Water Resources Utilization Department
8. Director General of the Department of Forestry
9. Secretary of National Commission for Environmental Affairs
10. Director General of the Department of Progress of Border Areas and National Races
11. Director General of the Department of Hydroelectric Power
12. Director General of the Department of Health
13. Professor of Department of Mathematics, Yangon University
14. Mayor of Yangon City Development Committee
15. Head of Department of Engineering (Water & Sanitation), Yangon City Development Committee
16. Mayor of Mandalay City Development Committee
17. Head of Department of Engineering (Water & Sanitation), Mandalay City Development Committee

Under MNC-IHP, the (5) Working Committees (WC) were organized according to the (5) Themes of IHP-VI. Each working committees consists of (10) members from the member departments and committees. The MNC-IHP normally held one session each for the National Committee (NC) and Working Committee (WC) during 2003-2005. Activities related to the
themes of IHP-VIII are implemented by the members of the working committees. The WC prepared the (27) research papers and shared the knowledge and experiences to the other national committee members during 2003-2005. The session could not be hold during 2006 to 2016. But the MNC-IHP are implementing the water related activities in line with the themes of IHP.

1.1.2 Status of IHP-VIII Activities

- Monitoring wet and dry deposition of Kaba-aye and measuring the pH and EC of rain water sample for (25) stations in Myanmar
- Monitoring the changes of Water resources in Myanmar
- Monitoring the low flow characteristics
- Assessment of the climate change impact on the flood events
- Developing the flood hazard map in order to reduce loss of lives and properties due to flood disaster. We have developed the flood hazard maps for Katha, Mandalay, Kalewa, Mawlamyine, Yangon during June 2014-May 2016
- Implementing the hydrological disaster risk management activities by using GIS and Remote Sensing Technologies
- Promoting the awareness programs for flood disasters

1.2 Activities at National Level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

1) Workshop on use of Remote Sensing Data for Flood Warning and Management was held at Horizon Lake View Hotel in Nay Pyi Taw, Myanmar on 25th -26th June 2014 by Japan Aerospace Exploration Agency –JAXA and DMH. Participants from the relative departments (Department of Irrigation, Water Resources Utilization Department, Directorate of water resources and improvement of river system, Relief and Resettlement Department, Central Statistical Organization, DMH ) attended in the meeting.

2) Transformation of Urban Management meeting (Part II-Flood Management project) with International Center for water Hazard and Risk Management (ICHARM), ADB and DMH was held in Multi Hazard Early Warning Center(DMH), Nay Pyi Taw on 16th September 2014. This meeting was attended the relative Departments such as Department of Agricultural Planning, Irrigation Department, Land Survey Department ,Myanmar Port Authority , General Administration Department, City Development Committee of Yangon, Mandalay and Mawlamyine, Relief and Resettlement Department, Human Settlement and Housing Development, Myanmar Engineering Society, Water Resource Utilization Department, Directorate of Water Resource and Improvement of River.

3) Workshop on utilization of disaster and climate risk information for strengthen flood hazards early warning system in Myanmar was held in Multi Hazard Early Warning Center(DMH), Nay Pyi Taw on 26th to 27th May 2015 organized by department of meteorology and hydrology (DMH) and Asian Disaster Preparedness Center(ADPC). This workshop was attend disaster related departments and NGO.

4) Kick–off Workshop on Common Alert Protocol CAP on MAP for Improving institutional responsiveness to coastal hazards through multi-agency situational awareness organized by department of meteorology and hydrology, ministry of transport in collaboration with Asian Institute of Technology (AIT), Sahana software
foundation and UNESCAP was held in Multi Hazard Early Warning Center (DMH), Nay Pyi Taw on 15\textsuperscript{th} July 2015. This kick-off workshop was attended the participants of department of meteorology and hydrology and disaster relative departments and NGO.

5) Second Progress Meeting on Development and Implement of User Relevant End to End Flood Forecast Generation for Myanmar organized by department of meteorology and hydrology and joint organized regional integrate multi hazards early warning center (RIMES) was held in Multi Hazard Early Warning Center (DMH), Nay Pyi Taw on 24\textsuperscript{th} to 25\textsuperscript{th} July 2015. This meeting was attended participants of department of meteorology and hydrology and disaster relative departments and NGO.

6) Meeting for Risk Assessment jointly organized by ADB and Department of Meteorology and Hydrology was held in Multi Hazard Early Warning Center (DMH), Nay Pyi Taw on 14\textsuperscript{th} October 2015. This meeting was attended the flood disaster management departments.

7) Final Workshop of Flood Management Project Assessment jointly organized by ADB and Department of Meteorology and Hydrology was held at 23 May 2016. This workshop wa attended from flood disaster related departments and organizations

1.2.2 Participation in IHP steering committees/working groups

Participants from DMH attended the UNESCO-IHP 22\textsuperscript{nd} Regional Steering Committee Meetings for Southeast Asia and Pacific during 2014-2016

1.2.3 Research / applied projects supported or sponsored

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1.2.4 Collaboration with other national and international organizations and / or programmes

Myanmar is the member country of EANET (Acid Deposition Monitoring Network in East Asia) since 2005. So Myanmar collaborate with EANET's activities.

Myanmar is the member country of Regional Integrated Multi-Hazard Early Warning System (RIMES) since July 2015.

1.2.5 Other Initiatives

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1.3 Educational and Training Courses

1.3.1 Contribution to IHP courses

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1.3.2 Organization of specific courses

1) Training Workshop for Satellite Based Drought Management was held at Tungapuri Hotel in Nay Pyi Taw, Myanmar on 15\textsuperscript{th} May 2014 by Department of Meteorology and Hydrology (DMH) & Asian Development Bank (ADB). This is one day training program to understand satellite –based drought monitoring system to be developed under TA6521, make satellite –based drought indices used in the system, drought risk map and conduct the cost benefit analysis using freely available data. This training workshop was attended participants from the Relative Departments
2) Training workshop on Hydrologic modeling was held by DMH with ADPC and NVE’ Expert team at October 2014 in Nay Pyi Taw. This training workshop was organized by Asia Disaster Preparedness Center (ADPC) and Norwegian Water Resources and Energy Directorate.

3) Hydrological Grade III course was held at Department of Meteorology and Hydrology during 5 January - 13 March 2015. The 25 participants attended in this training.

4) Rainfall Run-off (RRI) and Storm Surge Model Training Jointly organized by Department of Meteorology and Hydrology(DMH) and ADB was held in Multi Hazard Early Warning Center(DMH), Nay Pyi Taw on 12th to 14th May 2015. This training was attended participants from the Relative Departments such as Department of Meteorology and Hydrology(DMH) and Irrigation Department(ID).

5) Rainfall Run-off (RRI) and Storm Surge Model Training Jointly organized by Department of Meteorology and Hydrology(DMH) and ADB was held in Multi Hazard Early Warning Center(DMH), Nay Pyi Taw on 15th to 17th June 2015. This training was attended participants of department of meteorology and hydrology (DMH) and Irrigation Department (IR).

6) “Follow up training” on RRI and Storm Surge Modeling was held in Multi Hazard Early Warning Center(DMH), Nay Pyi Taw on 12th, 13th and 16th October 2015. This training was attended participants from the Relative Departments such as Department of Meteorology and Hydrology (DMH) and Irrigation Department(ID).

7) “ Training workshop on Training Workshop on Hydraulic Modeling using HEC-RAS joint organized by department of meteorology and hydrology and Asian Disaster Preparedness Center (ADPC) was held in Multi Hazard Early Warning Center (DMH), Nay Pyi Taw on 8th to 10th December 2015. This training workshop was attended 10 participants of department of meteorology and hydrology.

8) “Follow up training” on RRI model and Storm surge model was held in Multi Hazard Early Warning Center(DMH), Nay Pyi Taw on 25th to 28th January 2016. This training was attended participants from the Relative Departments such as Department of Meteorology and Hydrology (DMH) and Irrigation Department(ID).

9) Country training on Common Alert Protocol CAP on MAP regarding with improving institutional responsiveness to coastal hazards through multi-agency situational awareness jointly organized by department of meteorology and hydrology, ministry of transport in collaboration with Asian Institute of Technology (AIT), Sahana software foundation and UNESCAP Common Alert Protocol (CAP) DMH was held in Multi Hazard Early Warning Center (DMH), Nay Pyi Taw on 25th to 26th February 2016. This training was attended participants of department of meteorology and hydrology and disaster relative departments and NGO.

10) “Flood Disaster Risk Assessment training” jointly organized by DMH and ADB was held in Multi Hazard Early Warning Center(DMH), Nay Pyi Taw on 30th March to 6th April 2016. This training was attended participants of department of meteorology and hydrology (DMH) and Irrigation Department (IR).

11) “Training workshop on hydrological modeling of Improving flood forecasting capacity of DMH to strengthen flood warning system in Myanmar” jointly organized by department of meteorology and hydrology and Asian Disaster Preparedness Center (ADPC) was held in Multi Hazard Early Warning Center (DMH), Nay Pyi Taw on 30th May to 2nd June 2016. This workshop was attended participants of department of meteorology and hydrology.
1.3.3 Participation in IHP courses

1.4 Cooperation with the UNESCO-IHE Institute for Water Education and/or international/ regional water centers under the auspices of UNESCO

1.5 Publication

1.6 Participation in International Scientific Meeting

1.6.1 Meeting hosted by the country

The Regional Training Workshop on “National Adaptation Plans (NAPs) for Asian Countries” jointly sponsored and organized by UNFCCC Secretariat, Least Developed Countries Expert Group (LEG) and Department of Meteorology and Hydrology (DMH) was held at the Inya Lake Hotel in Yangon. This workshop was conducted with the objectives: to provide technical guidance and support and to understand the procedures of funding mechanism in addressing to formulate and implement National Adaptation Plans of the regional countries.

1.6.2 Participation in meetings abroad

The Secretary of MNC-IHP is a Permanent Representative of WMO and so he has contact and coordinate with WMO’s activities.

The representatives of MNC-IHP participated in

- Workshop in Hydrological Modeling at the Norwegian Water Resources and Energy Directorate (NVE), Norway, 2-6 June 2014
- Training on SSOPs for Costal Multi-Hazard Early Waring System, China, 9-11 June 2014
- Site Event of 6 Asian Ministerial Conference on Disaster Risk Reduction, Thailand, 28-31 July 2014
- Ayeyarwady Futures Program Workshop on Hydraulic modeling for the Chindwin river basin in Myanmar, Thailand, 18-22 Aug 2014
- Integrated Water Resources Management – Institutional Building and Training, Norway, 8-12 September 2014
- Workshop on Assessment of Climate Change Impact on Watershed Hydrology, Pakistan, 15-17 September, 2014
- Policy Makers Dialogue and Capacity development for Disaster Risk Reduction and Management in Asia and the Pacific Harnessing Information and Space Technology and Geographical Information Systems, Thailand, 23-25 September 2014
- Workshop on Capacity development for Immediate Access and Effective Utilization of Satellite Information for Disaster Management , Indonesia, 5-16 October 2014
- Workshop on Space Technology for Drought Monitoring and Early Warning, China, 28-31 October 2014
- Workshop on Space Technology and Geospatial Data Management for Disaster Risk Reduction and Sustainable Development, Korea, 9-22 November, 2014
- Workshop on Capacity development for Immediate Access and Effective Utilization of Satellite Information for Disaster Management, Japan, 1-12 December, 2014
- Workshop on Disaster Risk Management, Japan, 5 Jan-21 February 2015
- Workshop on Tranboundary Flood Risk Management, Switzerland, 19-20 March 2015
- 2nd Climate Services User Forum for the water sector (CSUF-2), Bangladesh, 22-23 April 2015
- Regional Workshop on Geographic Information Systems(GIS) for Disaster Risk Management, India, 4-31 May 2015
- Application of Space Information Technology in Major Natural Disaster monitoring and assessment and 2nd ASEAN workshop on Development of mechanisms for aquisition and utilization of space-based information during emergency response, China, 2-5 June 2015
- The Mekong River Commission Flash Flood Guidance (MRCFFG) System, Cambodia, 24-26 June 2015
- Workshop on Tranboundary Flood Risk Management, Switzerland 25-26 June 2015
- Capacity Development for Flood Risk Management with Building IFAS, Japan , 6 July 1 Aug 2015
- Sustainable Water Management in Era of Big Data and SATREPS Water Related Disaster Team Meeting, Japan 27 July -11 Aug 2015
- International Workshop on Tropical Cyclones Forecasting(ITWTCF), RSMC, India, 3-14 Aug 2015
- Lower Mekong Initiate Disaster Response Exercises and Exchange Workshop, Lao, 22-25 September 2015
- Flood Forecasting System for South asia and Southeast asia, India, 26 October-1 Nov 2015
- ESCAP/WMO Typhoon Committee Roving Seminar, Lao, 4-6 November 2015
- Seventh Session of the Meeting of the Parties to the UNECE Convention on the Protection and use of tran boundary water causes and International lakes, Hungary , 17-19 November 2015
- Workshop on the guideline for space-based information in ASEAN, Thailand, 16-18 Dec 2015
- Advance Flood Forecasting, Flood Flash Forecasting, Remote Sensing and GIS Application in Hydrology, Thailand, 18 Jan- 17 Feb 2016
- JST-JICA Satrep Water -Related Disaster Team Workshop and the Asia Water Cycle Symposium (AWCS 2016), Japan, 29 Feb -3 March 2016
- Climate Services User Forum for the Water Sector in South Asia(CSUF-Water-3) in Conjunction with the Eight Session of South Asia Climate Outlook Forum(SASCOF-8), Sri Lanka, 26- 28 April 2016
1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

- Cooperation with ICHARM, RIMSE, ADPC, ADB, NVE, JICA, JAXA, ICIMOD, ESCAP, AIT, TICA, WMO, EANET, etc.,

1.7.2 Completed and ongoing scientific projects

Ongoing scientific projects

Project I- Development and Implementation of User-Relevant End-to-End Flood Forecast Generation for Myanmar support by Indian Government and technical assistance by RIMES

Implementation period: April 2014 – March 2017

Project II- Transformation of Urban Management(ADB TA-8456) Part II-Flood Management(funding by ADB, technical assistance by CTI & ICHARM-Japan)

Implementation period: July 2014 to June 2016

Project III- Hydro-met observation and information system modernization (AYEYARWADY INTEGRATED RIVER BASIN MANAGEMENT PROJECT )

Duration: 31 March, 2015 to 31 March, 2020

Project IV- Improving flood forecasting capacity of DMH to strengthen flood Early Warning System in Myanmar (Supported by Norway Gov. and technical assistance by ADPC)

Duration: Nov 2015- October 2017)

2. FUTURE ACTIVITIES

2.1 Activities planned until / December 2016

- Developing the flood hazard map for Bago, Mawlaik and Monywa.
- Installation for Automatic water level stations for major river

2.2 Activities foreseen for 2017-2018

- The MNC-IHP will try to implement the water related activities in line with the themes of IHP
- IHP national committee will continue to encourage scientific and technical symposia and workshops
- The members of MNC-IHP will participate in the international and national activities of IHP.

2.3 Activities envisaged in long term

- The MNC-IHP will try to implement the water related activities in line with the themes of IHP
- IHP national committee will continue to encourage scientific and technical symposia and workshops
- DMH will upgrade the manual to automatic observation systems and more advanced flood early warning system.
- DMH will study the impact of climate change on water resources