

WORLD METEOROLOGICAL ORGANIZATION

Preparatory Meeting for the JOINT RA II/RA V WORKSHOP ON WIGOS FOR DISASTER RISK REDUCTION

Jakarta, Indonesia, 21-23 April 2015



FINAL REPORT



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EXECUTIVE SUMMARY

A Joint RA II/RA V Workshop on WIGOS for Disaster Risk Reduction (DRR) with a focus in the Southeast Asia region, is planned for the 4th quarter of 2015, in Jakarta, Indonesia, at the kind invitation of Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG). In order to prepare that Workshop a Preparatory Meeting was held in the same place, from 21 to 23 April 2015, also at the kind invitation of BMKG.

Major goals of this Preparatory Meeting were to review the existing WIGOS related projects in RA II and RA V, and to draft preliminary plans for joint projects that could enhance the data quality and availability for the benefit of warnings and forecasts, particularly in the South East Asia region in the event of high impact weather.

The meeting successfully reviewed the existing projects and drafted two project plans, one related to radar data and another one related to the use of satellite data.

The meeting also reviewed the draft programme of the workshop, and agreed with the approach and organization, such as dates (13-15 October 2015), venue and participants.

GENERAL SUMMARY

1. OPENING

The preparatory meeting for the Joint RA II/RA V Workshop on WIGOS for Disaster Risk Reduction (DRR) was opened by the Director-General of the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), Dr. Andi Eka Sakya at the headquarters of BMKG in Jakarta, Indonesia, at 09:30 hours on Tuesday, 21 April 2015.

1.1. Welcome remarks, by the NMHS of Indonesia (BMKG)

Dr. Sakya, welcomed the participants to the headquarters of BMKG. He expressed his appreciation to WMO for the initiative of arranging a joint Workshop for RA II and RA V, recalling that 55% of the world's natural disasters occur in the Asia/Pacific region. He also mentioned the major weather and climate phenomena such as El Niño, the Monsoons and typhoons, that affect this region, one of the most populated areas in the world. Finally he wished the participants a successful meeting and a pleasant stay in Jakarta.

1.2. Opening remarks, by the Secretariat

Dr. Lars Peter Riishojgaard, WIGOS Project Manager, thanked Dr Sakya and Indonesia for hosting the meeting at BMKG in Jakarta, on behalf of the WMO Secretary General, Dr. Michel Jarraud and the Director of the WMO Observing and Information Systems Department, Dr. Wenjian Zhang. He recalled the scope of the meeting, which was to (i) review the use of radar and satellite data particularly as concerned monitoring and forecasting high impact weather, and (ii) to prepare for the subsequent Workshop in October, and he made reference to the Regional WIGOS Implementation Plans (R-WIP-II and R-WIP-V) as the basic documents for the development of joint WIGOS projects across the two Regions. Finally, he invited the BMKG to nominate a Chairperson for the meeting, suggesting Mr. R. Mulyono Rahadi Prabowo as a possible Chairperson. This suggestion was accepted unanimously.

2. ORGANIZATION OF THE MEETING

2.1. Objectives of the meeting

Mr. Luis Nunes, WIGOS Scientific Officer, delivered a short presentation about the objectives of the meeting. He recalled the expected outcomes as stated in the concept note of the meeting and he suggested the following approach for the discussions:

- Review the requirements for observations from those WMO application areas (see OSCAR/Requirements) that are related to DRR: Global Numerical Weather Prediction, High Resolution Numerical Weather Prediction, Nowcasting and very short range forecasting;
- Review other applicable recommendations related to monitoring and forecasting tropical cyclones and other high impact weather phenomena in the region;
- Identify observing systems (surface and space-based) that could potentially contribute with more and better data/products;
- Identify capacity development needs, including training;
- Draft solutions to address the needs: Proposals for steps, tasks, timeframe, etc.

Finally, he recalled the terms of reference of the ad-hoc task team (also stated in the concept note) as well as the provisional agenda for this meeting.

2.2. Working arrangements

Ms. Neng Alia and Mr. Maman Sudarisman from BMKG, provided some practical information to the participants, regarding the timetable, including a photo session, and other useful arrangements.

3. REVIEW OF EXISTING WIGOS RELATED PROJECTS IN RA II AND RA V

3.1. Presentation of the relevant existing WIGOS related projects in RA II and RA V

The following presentations were delivered by invited experts (agenda items 3.1 and 3.2):

Relevant existing WIGOS related projects in RA II, by Ms. C. Pei/China:

- Summary and status of the WIGOS projects under the R-WIP of RA II:

Project I - Monitor and review the Implementation of EGOS-IP in RA II: Actions completed - expert group established, work plan drafted and Fund Plan developed; Actions to be completed - a Portal to be developed and the gaps and priority actions to be identified;

Project II - Standard and Practical Portal, including Technical Documents with Necessary Details in English from all RA II Members: Actions completed - 1st phase (2013) of KMA's domestic project for the standardization of met observations, since the end of 2014, 80% of the data is collected and QC in real time; Actions to be completed - a portal to be developed in 2015 to share the experience and benefits from the standardization, also the preparation for collecting regional standard and best practices regarding data exchange, sensor inter-comparison or calibration from members;

Project III-1 - Integration of Surface-based Remote Sensing Data in the East Asia: Actions completed - Review progress of on-going activities (a 2-D grid precipitation product was generated experimentally from KMA's CAPPI and AWS by JMA, and a dissemination plan for ground-based GNSS on WIS/GTS were discussed), technical issues for data exchange in operations were identified; Actions to be completed – to encourage the exchange of data among members and to discuss how to develop a feasible and optimal draft design on integrated surface-based remote sensing observations;

Project III-2 - Capacity Building in Radar Techniques in the Southeast Asia: Actions completed - Regional Training Workshop on Weather Radar Maintenance, QPE and QPF (Bangkok, 24 Feb - 7 Mar 2014) with support of the Japan-ASEAN Integrated Fund, Cooperative activities for improving radar data and developing radar composite map between Thailand and Japan is ongoing under the ESCAP/WMO Typhoon Committee, the bilateral cooperative activities between Malaysia and Japan is also ongoing for the same purpose; Actions to be completed - Establishment of any trans-boundary activities for radar network;

Project IV - Enhance the Availability and Quality Management Support in Surface, Climate and Upper-air Observations: Actions completed - WMO/JMA Survey on meteorological instruments, calibration and training in RA II (report available on the RIC Tsukuba website) was conducted followed by JMA/WMO Training Workshop on Calibration and Maintenance of Meteorological Instruments in RA II (Feb, 2013), practical on-the-job training on instrument provided by experts from RIC Tsukuba to the Bangladesh Meteorological Department was also conducted; Actions to be completed - to develop a draft report for the investigation survey on quality management (QM) of meteorological observation by NMHS in RA II and to hold a workshop focusing on sharing and transferring skills of observations QM;

Project V - Develop a Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) in Asia Node: Actions completed - The dust forecast model has been continuously operated throughout the year daily, and a portal for dust forecast products was developed; Actions to be completed - Dust forecast model products verification, CMA will apply for WMO Regional Specialized Meteorological Centers with Activity Specialization on atmospheric Sand Dust Forecasts;

- Description of the CMA data monitoring center;

- Other WIGOS activities in China include network design, data sharing agreements with national agencies and integration of the radar network.

Relevant existing WIGOS related projects in RA V, by Ms. A.Lane/Australia:

- The R-WIP for RA V and the Regional WIGOS working structure were presented. Since the R-WIP for RA V was approved in May 2014, there are no details of the status of its implementation. The two key outcomes identified in the RA V Strategic and Operating Planning for WIGOS are: WIGOS implemented in RA-V and Observing networks further

improved in RA-V.

The progress to date of the RA-V Task Team on Satellite Utilization (TT-SU) is as follows: two workshops held during the 4th and 5th Asia/Oceania Meteorological Satellite Users' Conferences (AOMSUC-4 and 5), and a presentation at AOMSUC-5; based on outcomes of AOMSUC-4, Melbourne Virtual Laboratory for Training and Education in Satellite Meteorology (VLab) runs monthly Regional Focus Group meetings (20-30 regular attendees from across RA-V - these meetings are open to people from other Regions); the TT-SU has drafted the prioritized requirements for satellite observations for RA-V, and invitations have been sent out to increase Regional representation on the Task Team

National WIGOS related activities, by Mr. Riris Adriyanto/Indonesia:

- BMKG is working with the Indonesian Water agency, which have their own hydro-meteorological networks, for the exchange of data.
- BMKG is developing its radar network in order to improve the country coverage.
- BMKG has been trying to calibrate its weather radars with rain-gauges data;

National WIGOS related activities, by Mr. Fachri Radijab/Indonesia:

- The BMKG is running a modernization project (2012-2015) with Meteo France International, to strengthen BMKG climate and weather service capacity, which includes the modernization of the observing systems, the dataflow and the IT infrastructures. New automated stations (on land and on voluntary observing ships) are being installed, as well as lightning detectors, a wind profiler and upper-air stations.

National WIGOS related activities, by Mr. Dohyeong Kim/Republic of Korea:

- The KMA as one of the co-leaders of the RA II WIGOS Project No.VI (Develop Support for NMHSs in Satellite Data, Products and Training), and its representative described the status of the following components:
 - Development of Quarterly newsletters for RA II Members – 9 numbers have been issued since 2013, plus 13 numbers before the start of the WIGOS project
 - The webpage of the RA II Pilot Project was established on the WMO Space Programme (WMOSP) website with the following link: http://www.wmo.int/pages/prog/sat/ra2wigosproject-intro_en.php and also at http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro_en_jma.html;
 - The 1st Meeting of the Coordination Group (Tokyo, Japan, 21–23 February 2011) agreed to share information on access to satellite imagery, data, products and training information through the RA II Pilot Project portal site; This Portal Site is still to be developed;
 - The RA II Pilot Project questionnaire on the web to understand the needs of satellite data users in RA II was conducted with the purpose to monitor the availability and use of existing satellite data and products and to identify any associated difficulties or limiting factors in RA II; 20 out of 35 Members in RA II responded (results are published in RA II Newsletter Vol. 3 No 2 and the report of 2nd Coordination Group meeting.
 - The 4th AOMSUC was held in Melbourne, Australia, October 2013, hosted and sponsored by the Australia and co-sponsored by China, Japan, Republic of Korea and WMO. The 5th AOMSUC was held in Shanghai, China, October 2014, and hosted by China.

National WIGOS related activities, by Mr. Y. Tanaka/Japan:

- Most of the NMHSs in Southeast Asia operate weather radars, however many of them cannot utilize full capabilities of radars due to lack of skills, resources and experiences. To assist those Members, JMA takes every opportunity including RA II WIGOS Project No. III-2 (Capacity Building in Radar Techniques in the Southeast Asia).
- Mr. Tanaka informed the meeting that Thailand succeeded in improving quality of radar data using JMA's software and developed nation-wide composite images.

- Mr. Tanaka also informed the meeting that Malaysia just succeeded in converting its radar data into a common format and is ready to take same steps as Thailand for improving quality of radar data and developing composite images. Mr. Tanaka stressed that such practical technology transfer is essential to achieve high-quality radar composite map covering Southeast Asian region in the future.
- Prior to the implementation of international radar data exchange, the following issues need to be addressed at the national level(s): identify solutions for the issue of non-standard (proprietary) data formats; maintenance of national radar networks; data quality control by NMHSs.
- The need for calibration of surface meteorological instruments, traceable to international standards, common to all countries in RA II, was mentioned. A cooperation project by the Japan International Cooperation Agency (JICA) was described, which is supporting the Bangladesh NMHS to acquire and operate national standards for the main meteorological variables. The contribution of WMO/RIC Tsukuba was a key to the success of the project.

National WIGOS related activities, by Mr X. Fang/China:

- The current status of the Chinese Meteorological Satellites was described, including the polar and the geostationary systems;
- The future programs of the Chinese Meteorological Satellites were presented, specially the features of the 1st satellite (FY-4A) of the next-generation series of geostationary satellites, which will feature improved performance in several areas.
- The data distribution and services were also described, including the CMACast, which is relevant for the Southeast Asia region.
- Applications of the FY-4A satellite data include weather (e.g. monitoring of tropical cyclones and heavy rain), natural disasters (e.g. monitoring of forest fires and floods) and environment (e.g. monitoring of vegetation growth).

3.2. Analysis and discussion of synergies for common project(s) to be developed

Discussions during the presentations are summarized as follows (agenda item 3.3):

The possibility of using the CMA Data Monitoring Center for monitoring of data quality from other countries in the Region was discussed; the WIGOS Project Office may consider using this center as a show case.

- Dr. Riishojgaard mentioned the need to document the difficulties at national level, of developing Project No.II (Standard and best practice Portal, including technical documents with necessary details in English from all RA II Members), before further progress.
- Dr. Riishojgaard stressed the need to document in detail how the activities are planned and how the goals will be addressed, including individuals responsible for each activity/project, as well as the actions and their milestones.
- Ms. Lane informed the meeting that the RA V Members are interested in regional exchange of experience regarding procurement of meteorological equipment such as radars and lightning systems.
- Dr. Riishojgaard underlined that the WMO Secretariat will help convey the regional priority requirements to the space agencies; he suggested, as a possible outcome of this meeting, the establishment of an agreement between the Regional Associations II and V with the relevant space agencies, to allow the operational and timely production of rapid scans on request, in case of forecast of high impact weather in the region.
- Regarding the issue of bringing regional requirements for satellite data in support of DRR to the attention of the space agencies, the meeting expressed itself in favor of organizing a dedicated meeting on this issue during AOMSUC-6 (9 – 13 November 2015, Tokyo/Japan)
 - Ms. C.Peï suggested that WMO should promulgate existing guidance for procedures of using rain-gauges data to calibrate Radars, such as the guidance issued by NOAA.
 - Dr. Riishojgaard mentioned the importance of radar data for aviation safety, so making

radar data available in a user-friendly way for ATCs should be a goal of the Joint RA II/RA V Workshop.

- It was also mentioned that rapid-scan satellite data are important not just for high impact weather monitoring and forecasting but also for the monitoring of volcanic ash plumes; Indonesia thanked Australia for sharing MTSAT rapid scans with BMKG. For other countries this means inter-Regional cooperation.

- The plans to increase the number of operational upper-air stations in Indonesia, was considered by Dr. Riishojgaard as very remarkable, given what is happening in most other parts of the world, where the number of radiosonde observations has been steadily declining; He expressed his appreciation for this good news.

- It was mentioned that the operational cycle of the Himawari-8 satellite, of 10 minutes is the default service from mid-2015 onwards. Shorter interval scans are available for limited areas

- Ms. Lane suggested that a survey on meteorological instruments and calibration in the RA V countries should be issued, similarly to the one carried out in RA II.

- Mr. Adriyanto mentioned that the monitoring of sea surface temperature is also an important application for typhoon forecasting, and he thanked CMA for having provided Indonesia with a receiving satellite station.

- Mr. Fang suggested that WIGOS should define future standard format for raw satellite data, with the involvement of CGMS and IPET-SUP

3.3. Additional points raised during the meeting:

- The importance of surface pressure measurements from ocean buoys for tropical cyclone monitoring and forecasting – the collaboration with DBCP was mentioned;

- The need for Members in the region to be aware and active regarding calibration of all surface observing instruments with traceability of national standards to international standards;

- The relevance of lightning detection networks for nowcasting activities;

- The importance of lidars and ceilometers for volcanic ash prediction;

- The need to ensure involvement from RA V TT-SU and coordination for RA II WIGOS projects;

- The need to ensure the necessary resources for the Regional WIGOS structures (RA II and RA V) to be able to meet face-to-face;

- The need to have face-to-face training events to ensure adequate results;

The WMO Secretariat inquired about outstanding WIS issues in the region, but none were reported.

4. DRAFT PLAN FOR COMMON PROJECT(S) TO BE DEVELOPED

4.1. Drafting of a detailed plan for common project(s), covering weather radars, satellites, lightning detection and other systems (drafting groups)

Dr. Riishojgaard started the discussion on potential joint RA-II/V WIGOS projects off by asking the participants for suggestions about possible focus areas for such project(s); It was decided to form two breakout groups: one to draft a project plan on radar data and another one to draft a project plan on satellite data.

The WMO Secretariat proposed a series of slides with templates for the breakout groups as a basis for their discussions on the projects plans.

The participants split into the two breakout groups, the radar data group being chaired by Mr. Y. Tanaka, Japan, and the satellite data group being chaired by Mr. D. Kim, the Republic of Korea.

4.2. Discussion and conclusions (plenary)

The breakout groups met in two sessions to draft the projects plans using the proposed templates and then reported to plenary. The summary of the discussions is as follows:

- Radar data breakout group (see appendix II-A for the full set of slides with detailed plans):
 - Overall goals: Improvement of data quality from the existing radar networks; Expansion and integration of national radar networks; International exchange of radar data
 - The source of requirements should be the OSCAR/Requirements database for the Nowcasting and Very Short Range Forecasting application area;
 - The level of products should be: Create radar composite image (mosaic) in each member country; Exchange national mosaic imagery; Processable data to be exchange in the future.
 - Implementation steps: Establishment of the Coordinating Group; Preparation and distribution of survey (regarding all the metrics). Development and publishing of report on survey results; Identification and prioritization of actions according to the result of the survey, with specific capacity development activities among Members, to cope with the needs of the national radar networks in terms of improving radar coverage, performances, data quality and national integration (mosaic); The Coordinating Group will draft a Implementation Plan for the exchange of radar images and processable data considering possible data centers and procedures. As a first step the Coordinating Group will promote the bilateral exchange of data between the Members of the Region.
- Satellite data breakout group (see appendix II-B for the full set of slides with detailed plans):
 - Overall goals: All Members in the target region to receive and use geostationary satellite data as full spatial, spectral and temporal resolution subsets for their national region of interest, including generation of key products; To develop a mechanism for countries in target area to request and receive and ingest event-driven rapid-scan geostationary satellite data.
 - Specific source of requirements: OSCAR/Requirements; SCOPE-Nowcasting; IPET-SUP; from satellite users. The primary drivers for the requirements for the rapid-scan data are: rapidly developing convective systems; aviation safety; volcanic ash monitoring;
 - Two levels of products should be considered for distribution of satellite data:
Digital data, for which reception and data processing systems would be needed to access the data;
Imagery/product, which should be available on a web site.
 - Implementation steps: 1) Establishment of rapid-scan related hardware, software and human capacity of target countries, and identification of capacity development needs if applicable; 2) Establishment of a list of target products for the three application category; 3) Development of formal agreement between WMO and CMA, JMA, and KMA.

5. WORKSHOP PROGRAMME AND PARTICIPANTS

5.1. Review of the draft workshop programme

The meeting reviewed the proposed scope of the proposed October Joint RA-II/V Workshop on WIGOS for DRR, and it was agreed that this event would be primarily technical in nature, and that the major goal would be to finalize and approve the projects plans (see item 4).

The meeting reviewed and modified the draft programme of the Workshop accordingly, and the new version is included as Appendix III.

5.2. Tentative dates, venue and participants

The meeting confirmed the dates of the Workshop, 13-15 October 2015, to be hosted by BMKG at Indonesia, probably in the training facilities outside Jakarta.

The meeting supported the participation in the Workshop, of senior representatives from Member countries of the ASEAN, as well as from other key Members from RA II and RA V, as suggested in the concept note.

5.3. Other recommendations

Nothing to report

6. CLOSURE

The meeting was closed by the Chairperson Mr. M. Prabowo at 1 PM, the 23 April 2015.

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**Draft Programme for the Joint RA II/RA V
Workshop on WIGOS for Disaster Risk Reduction**
Indonesia, 13-15 October 2015 (tentative)
Version 1.0, 23-04-2015

Day 1

- Opening remarks (WMO and Host)
- Organization of the workshop

- Session 1:
 - Country reports, including national Radar requirements and plans, as well as national use of satellite data. They should especially focus on the challenges in monitoring and forecasting extreme weather events, such as Tropical Cyclones, including impact, and where additional observing capabilities could help, illustrated by cases and referring to user requirements (8 in the morning, 8 in the afternoon, about 15 minutes for each Country);

Day 2

- Session 2:
 - Presentations by invited experts in specific themes (presentation 60 minutes, plus discussion 30 minutes); They should address the interoperability of Member's observing systems for the real-time exchange of meteorological data and products:
 - weather radars,
 - meteorological satellites - one presentation from each satellite operator (CMA, JMA, KMA)
 - Other observing systems (only one presentation for each system):
 - lightning detection systems
 - GNSS
 - "rainfall from cell towers"

- Session 3:
 - Review and discussion of the draft project plan proposed by the *ad hoc* task team (outcome of preparatory meeting, 21-23 April 2015); Discussions should focus on the analysis of gaps and issues, such as data availability, geographic coverage, timeliness and quality of observations in both regions, and how a joint WIGOS project for RA II and RA V can address them, in order to primarily enhance relevant data and products for weather watch and nowcasting activities.

Day 3

- Session 3: Continued (AM)

- Session 4: (PM) Conclusions and recommendations regarding the new WIGOS joint RA II/RA V project, including specific tasks, timeline/milestones and people involved (members and leaders).

- Closure of the workshop