

UNITED NATIONS ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE
PACIFIC

ASEAN Regional Workshop on Standardization of Methodologies for Multi-hazard Risk
Assessment and Integration of Satellite Imageries for Rapid Assessment of Post-disaster
Damage and Losses

7-9 December 2016
Sriracha, Thailand

Summary Meeting Report

(Final)

Prepared by the Secretariat

I. Conclusions and Recommendations

For the institutionalization of knowledge products presented during the workshop:

1. There is a lack of standards and no official format in many countries to share the information, especially satellite imagery. This can often lead to misinterpretation of information. Therefore, it is important to work together on the information sharing within the ASEAN region.
2. Good communication and cooperation is required at several level among all actors involved in disasters and emergency response. This includes local people, local authorities and national, regional and international authorities, NGOs etc.
3. Participants further requested access to satellite imagery for disaster preparedness, especially for regional organisations and those who do not have access to the international charter during times of immediate disaster.
4. Geospatial products (maps) should be presented to the general public in addition to their existing target audiences. This should be done in an easily readable and understandable way to order to avoid confusion. Recommendation on how to specifically improve geospatial mapping products where discussed in further detail.
5. Participants showed keen interest in repeating the simulation exercises carried out during the three day workshop. The simulation exercises were highly appreciated as a practical way of understanding the complexity of decision-making during emergency response using Earth Observation (EO) and geospatial products.
6. There is a real challenge in using and understanding technical information regarding space technology applications and geospatial products despite the fact that some countries already have specialised training centres. ESCAP is requested to help organise training courses which would be open to a wider audience, not only technical professionals but also decision-makers and whoever works in emergency, recovery and other critical periods during disasters.
7. Both the “Procedural Guidelines for NDMAs and Space Agencies in ASEAN countries for sharing space-based information during emergency response” and the “Geospatial Decision Support Handbook for Specific Hazards in ASEAN” are very helpful and useful during emergency response.
8. Participants acknowledge and appreciate the efforts made by ESCAP, UNOOSA, UNOSAT, AHA Centre, LAPAN and GISTDA in the development and evolution of these products and their efforts since 2014 in identifying the regional and national challenges that such knowledge products address.
9. The geospatial handbook on specific hazards should be finalised, shared with the expert community for feedback and integrated into the relevant emergency response mechanisms and policy tools through regional coordinating bodies such as the ASEAN Committee on Science and Technology or the Committee on Disaster Risk Reduction.
10. More technical support to NDMA is required for incorporating the use of earth observation and geospatial products including capacity development for analysing and

utilizing space applications. ESCAP is requested to provide valid support through training in GIS and Remote Sensing during the critical periods of response and recovery during and after the disasters.

11. Participants acknowledge that there are multiple ways of performing post-disaster rapid assessment in each country and that it is necessary for several agencies to work together to combine their knowledge and skills during such assessments. The manual on “Rapid Assessment for Resilient Recovery (RARR)” addressed some of these points providing practical solutions on how organisations can complement the work of one another in a more productive way during such assessments.

12. Rapid assessment is necessary for an efficient post disaster recovery. However, in many ASEAN countries the agriculture sector is of high priority and it suffers the most impact during disasters. Other complex priority disasters that affect agriculture can include drought and salinization of the soil. Therefore, drought and salinization monitoring is also required.

13. Participants accepted that damage and loss assessment is not always accurate but GIS and Remote Sensing can be very useful tools for response, recovery and rapid assessment. Therefore, there is a real need to improve technology for rapid assessment for damage and losses and to integrate existing information at the country level.

14. ESCAP is requested to officially invite and involve the newly formed National Disaster Management Agency of Malaysia (NADMA) in future meetings and workshops.

For improving geospatial mapping products:

15. Although participants agreed on the importance of near real-time information in support of disaster monitoring, they acknowledged that EO data requires time for processing as well as acquisition due to the orbit of satellites.

16. Geospatial products are often tailored for a certain audience and there is a minimum level of knowledge in ‘map-reading’ which is required in order to interpret such products. Participants recognised that geospatial products are often applicable to a more technical audience.

17. Information contained within geospatial products refers to terminology and references that many people cannot relate to. This is particularly true to the general public and media, where geospatial products, including the visualisation of information, seem to have the biggest impact in terms of information consumption, interpretation and dissemination.

18. In the case of geospatial products showing damage or extent, the gradation or intensity of such empirical values are not apparent in mapping products. For example, in cases of flood, water depth information is often not represented. This can lead to an overestimate of the scale and impact of a hazard when defining disaster in real terms. Such information requires integrated data not just from EO satellites.

19. In order to improve geospatial mapping products, it is suggested that space agencies, remote sensing organisations and relevant geospatial mapping agencies

provide detailed localised maps for local governments in addition to national level maps.

20. Geospatial mapping products should integrate not only satellite base maps but also digital elevation and other features including geology, topography etc. to describe the multiple dimensions of information or additional geospatial information such as residential areas, infrastructure etc. to describe more precisely the potential socio-economic impact.

21. Products should also be tailored and modified for different audiences and user requirements. This can include the same mapped area showing different points of interest, interpretation or local references so that they remain relevant to those reading and using the geospatial products.

22. Participants suggested the use of contextualised references when developing maps for the general public. For example, in addition to referring to height or scale in metric or empirical terms, reference can also be made to objects that are universally recognisable or understood by the local culture or national context.

23. When considering map legends, points and polygons on the actual geospatial mapping products should correspond to points and polygons on the corresponding map legend in order to have a clearer indication of map data elements in addition to colour matching. In order for end-users to understand map contents such elements should be as simple and clear as possible without omitting important information.

24. Participants acknowledge that each phase of the disaster management cycle requires different EO information and geospatial mapping products should be continually updated and released to reflect such time series analysis, production and distribution.

25. Historical disaster data can be important when issuing early warning alerts or preliminary damage and impacts maps. Therefore, such historical damage data can be integrated with real-time information such as weather, for example, in order to complement EO information alongside early warning alerts.

26. Risk information is critical when assessing the different phases of a disaster. Therefore, existing risk information should be included with iterations of geospatial mapping products in order to indicate potential changes in dynamics during a disaster or likely scenarios to be aware of when addressing emergency response.

27. In addition to releasing geospatial mapping products, some form of active communication or public relations is necessary in order to ensure that scientific analysis or interpretation of the products had been provided. This can often help in managing misinterpretation of the scale and impact of disasters through such approved or official announcements about the disaster situation as opposed to public interpretation of media 'hype' in addition to educating people on better understanding scientific and technical information.

II. PROCEEDINGS

A. Organization of the Meeting

1. The ASEAN Regional Workshop on Standardization of Methodologies for Multi-hazard Risk Assessment and Integration of Satellite Imageries for Rapid Assessment of Post-disaster Damage and Losses was held in Chonburi, Thailand from 7 to 9 December 2016. The meeting was organized by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and hosted by the Geo-Informatics and Space Technology Development Agency (GISTDA).

B. Attendance

2. The meeting was attended by National Focal Points (NFPs) of ESCAP's Regional Space Applications Programme for Sustainable development (RESAP) and representatives from disaster management authorities from the following ASEAN countries: Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand and Viet Nam. Specialized agencies and related organizations included GISTDA, the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) and the Philippine Institute of Volcanology and Seismology (PHIVOLCS). The complete list of the participants is included in Annex 2 of this report.

C. Opening of the meeting

3. The opening session of the regional workshop commenced with an opening speech from Ms. Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division (IDD), ESCAP and Dr. Anond Snidvongs, Executive Director of GISTDA. Mr. Syed T. Ahmed, from the Space Applications Section (SAS) of IDD, presented an overview of ESCAP and the workshop agenda.

4. In her opening speech, Ms. Bonapace thanked RESAP members for their continuous support in promoting the use of space technology both nationally and regionally. She highlighted the adoption of three landmark agreements over the last year that signal a fundamental transformation in our collective development aspirations. These include the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction and the Paris Agreement on Climate Change. She outlined that space technology applications have great potential to support the implementation of these global agendas. ESCAP organised the high level Asia-Pacific Space Leaders Forum in New Delhi, India alongside the 20th Intergovernmental Consultative Committee on RESAP. An outcome of these meetings was the decision to develop a new Asia-Pacific Plan of Action for Space Applications, 2018 – 2030 and a high-level declaration by space leaders in Asia and the Pacific to utilise space applications for sustainable development. Space leaders recognized that persistent gaps and needs still remain in many countries, including several ASEAN countries such as Cambodia, Laos, Myanmar and Viet Nam and that there is an opportunity to bridge the divide between the space community and end- users. She remarked that space technology applications can benefit many areas of development and the space community could produce practical tools to support these development sectors. ESCAP

is addressing these issues through the development of knowledge products and other institutional instruments and policy tools. Finally, she expressed her sincere thanks to Dr. Anond, for the strong support to ASEAN and ESCAP and commended their new ASEAN Regional Training Center for Space Technology and Applications (ARTSA).

5. In his opening speech, Dr. Anond Snidvongs expressed his appreciation and thanks to Ms. Bonapace and all the participants attending the workshop. He addressed the importance of national and international cooperation and coordination between the actors dealing with disasters, highlighting a lack of communication which is very important for coordination. He highlighted some future trends in space applications that would focus on three-dimensional data and augmented virtual information for disaster decision making. He also expressed GISTDA's willingness to support ASEAN countries, especially through its dedicated satellite and future satellite constellations. Dr. Anond reiterated that the aim of the workshop was to work together with ASEAN countries in order to prepare for the entire disaster management cycle, through sharing good practices on the use of innovative technologies for rapid disaster and damage assessment, as well as to evaluate the existing procedural guidelines and geospatial handbook. He underlined the expectations from the workshop were to see clear and concrete outcomes of activities and projects under these initiative. Finally, he requested participants to amend the workshop agenda slightly, in order to include a live scenario from the recent floods in Southern Thailand, to practically apply their knowledge to evaluate the current disaster response by providing recommendations on how to improve geospatial mapping products and services that GISTDA have provided in this case.

6. In his presentation, Mr. Ahmed, provided information on the background of ESCAP and its role as a regional development arm of the UN. His presentation introduced trends and analysis of disaster in Asia-Pacific over the last few years and an overview of the work of SAS within IDD, ESCAP. His presentation also outlined the new vision and strategy for RESAP and space applications in Asia-Pacific as agreed by space leaders at the Asia-Pacific Space Leaders Forum held in Delhi, India on 2 November 2016. Finally, he finished by providing an overview of the agenda for the workshop covering sessions on multi-hazard risk assessment, emergency response and rapid assessment over the duration of three days including field visits of the GISTDA satellite ground receiving station.

F. Multi-Hazard Risk assessment

7. The first session of the workshop, on multi-hazard risk assessment, consisted of four presentations. These included a presentation by Mr. Sung Eun Kim, Associate Economic Affairs Officer, Disaster Risk Reduction Section, IDD, ESCAP who presented on "Quantifying disaster impact and risk in Asia-Pacific"; Ms. J Elaine Layug Naparat, Technical Specialist for Remote sensing, GIS and Topographic Survey from RIMES, who presented on "Risk assessment modelling for Tsunami and Earthquake in ASEAN"; Dr. Chaowalit Silapathong, Deputy Director of GISTDA who presented on "Thailand's Risk Assessment & Modeling: EO Based Disaster Monitoring System"; and Ms. Mabelline Tuballa Cahulogan, Senior Science Research Specialist from PHILVOLCS who presented on "Hazard Mapping in the Philippines".

8. Mr. Kim's presentation focused on damage and loss related to disasters and how to quantify disaster risks. He also focused on the rationale for a probabilistic approach to risk assessment and disaster losses covering global multi-hazard Average Annual Loss (AAL). He made an overview on the expected future losses and probable maximum loss for ASEAN countries. He also provided an overview of how exposed cities and infrastructure are to disaster risks. He concluded that it is important to quantify the risk to well-being, indirect losses and to look at the risk to assets and well-being at the provincial level.

9. Ms. Naparat from RIMES introduced tsunami modelling and risk assessment in ASEAN countries, covering the processes of comparison of near-shore topobathy DEM data, DEM standards and requirements for tsunami simulation, seamless integration of topobathy data, bathymetric DEM development and survey, topographic Survey, automatic shoreline extraction and exposure data development and survey etc. She introduced technical tools such as the Internet based Simulation Platform for Inundation and Risk Evaluation (INSPIRE) and the Evaluation System for Computing Accessibility and Planning Evacuation (ESCAPE). She highlighted ongoing work regarding tsunami and earthquake. She also mentioned the work concerning earthquake modelling and risk assessment in ASEAN countries and the use of ShakeCast server at the Department of Meteorology and Hydrology (DMH).

10. Dr. Silapathong from GISTDA provided an overview of GISTDA's vision on how to use space applications in different fields and services. He covered satellite data services, how this information is processed and used on the ground for daily services, including all potential providers and users of such technology along the space and aerospace industry supply chain. He mentioned other centres available for training in space application. He introduced the Space Inspirium, GISTDA's interactive space museum. He also outlined Thailand's Disaster Monitoring Systems for flood, forest fire, drought and coastal and marine environment. For example, for flood monitoring, GISTDA uses the satellite swath planning allowing near real-time monitoring. For drought monitoring, daily band ratio indexes are used from Terra/Aqua MODIS, monitoring water bodies using high-resolution optical data. For forest fire monitoring and warning, GISTDA produces weekly forest fire risk maps that are continuously updated. For marine pollution, it is possible to produce oil spill incident trajectory prediction and incident backtrack, predicting the movement of oil using position, direction and speed data from coastal radar systems. Finally, he mentioned the recent floods in Southern Thailand and requested participants to use the real-time case study to provide feedback on the mapping products available from GISTDA to end-users and decision-makers.

11. Ms. Cahulogan from PHIVOLCS gave an overview of natural hazards in the Philippines, explaining the role of PHIVOLCS and their work on earthquake and volcanic activities. These activities are strictly connected to hotspots and active faults, which is why a large part of monitoring activities are concentrated in these active areas. Their work focuses also in loss estimation for volcanic risk. PHIVOLCS has two active services, PHIVOLCS Faultfinder and PHIVOLCS Geoportal, to provide support to on-going monitoring activities.

G. Emergency response

12. For the second session on emergency response there were two presentations: Mr. Syed T. Ahmed, SAS, IDD, ESCAP presented on “Procedural Guidelines for NDMA and Space Agencies in ASEAN countries for sharing space-based information during emergency response”; Ms. Valentina Spanu, SAS, IDD, ESCAP presented on “Geospatial Decision Support Handbook for Specific Hazards in ASEAN”.

13. Mr. Ahmed started his presentation with an overview of the procedural guidelines, the challenges identified in previous meetings and the solutions proposed by experts from ASEAN countries, UN agencies and regional institutions, through the development of guidelines. He described the seven steps of the Quick Guide which consist of: 1) Evaluating the specific disaster in order to decide if EO support is required; 2) Identifying geospatial information needs; 3) Assessing operational capabilities; 4) Making a request for EO support; 5) Sharing information with relevant authorities and decision-makers; 6) Integrating geospatial services and products for decision support; 7) Reflecting and providing feedback for the products and services received.

14. Ms. Spanu provided an overview of the geospatial handbook specifying the target audience. She mentioned details on the hazards covered regarding impact and damages that these extreme events have had on Asia-Pacific countries in the last two years. She introduced both the reference manual and the Quick-Guide versions with an explanation of the structure and rationale as to why they have been developed. She also provided a quick overview of the six common hazards affecting ASEAN countries including: 1) flood; 2) cyclone; 3) earthquake; 4) landslide; 5) forest fire; and 6) volcanic activity.

15. The session also included three exercises regarding emergency response, two of which were simulation exercises facilitated by ESCAP and one live exercise facilitated by GISTDA.

16. The first simulation exercise focused on assessing flood evacuation sites in Viet Nam during a flood situation. Participants were divided into three groups consisting of both geospatial information providers and decision makers and given a flood disaster scenario. Their challenge was to evaluate which evacuation sites were

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