TRAINING REPORT:
National Geo-portal and Geo-database for Disaster Risk Reduction and Sustainable Development

March 2017

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EXECUTIVE SUMMARY

The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the Asian Institute of Technology (AIT) organized an intensive training programme titled "National Geo-database and Geo-portal for Disaster Risk Reduction and Sustainable Development" at the Geoinformatics Center (GIC) of AIT from 6th February to 3rd March 2017. This training focused on enhancing technical and institutional capacities of the Pacific Island countries (PICs) to operate and manage geo-portals and geo-databases as key part of geospatial information system (GIS), and to effectively use geospatial data and technologies including remote sensing technologies for early warning and disaster risk reduction.

12 government officials from eight PICs attended the training. Ms. Tiziana Bonapace, Director of Information and Communications Technology and Disaster Risk Reduction Division (IDD) of ESCAP, Mr. Hitoshi Kozaki, Head of International Organization Department of the Embassy of Japan to Thailand, and Dr. Lal Samarakoon, Director of GIC joined the opening session and delivered opening speeches on 6th March 2017.

Participants learned and shared insights and thoughts on applications of geo-portal and geo-database as a crucial tool to better manage early warning and disaster risk reduction in the Pacific region. Participants developed their county level geo-portals, uploaded their country datasets, and customized geo-portals to meet country's specific situations. Lectures and lab sessions were also organized to learn geospatial data analysis including satellite imageries and remote sensing data, and to improve analytic methodology to support decision makers for early warning and disaster risk reduction. In order to meet requests by the participants on the training spot, additional sessions on mobile application development and usage of unmanned aerial vehicles (UAV) were organized along with exercise and operation of drone device at AIT campus. To ensure sustainability of geo-portal and geo-database in the PICs in the longer-term, the participants had specials sessions to draft three to five year national action plan on GIS for disaster risk reduction.

At the end of the training, participants have enhanced knowledge and skills to install and manage geo-portals and geo-databases, as well as to use geospatial data for early warning systems. Participants expressed the training as informative and constructive for improving their capacities on operating geo-portal and geo-database for disaster management. Self-evaluation showed that 10 of 12 participants rated the training as "excellent or "good". Self-assessment survey on capacity building also showed a significant improvement of participants' knowledge and competency on operating geo-portal and analyzing geospatial data for disaster risk reduction.

Ms. Bonapace, Director of IDD of ESCAP, Mr. Hitoshi Kozaki, Head of International Organization Department of the Embassy of Japan, and Mr. Kazuo Yamamoto, Vice President for Administration of AIT attended the closing session of the training on 3rd March 2017, listened participants' final wrap-up presentations including draft national action plans, delivered the certificates of the training, and interacted with participants on their evaluations and future plans.

As the next step, ESCAP and AIT will conduct country pilot projects in selected Pacific Island countries around May – August 2017, based on outcomes of the training. Pilot country selection will be made on the training results and national action plans developed by each participant during and after the training.

1. OVERVIEW

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and Geoinformatics Center (GIC) of the Asian Institute of Technology (AIT) organized a training programme on National Geo-database and Geo-portal for Disaster Risk Reduction and Sustainable Development. The training programme was held in GIC, AIT in Pathumthani, Thailand from 6th February to 3rd March 2017. 12 participants from eight Pacific Island countries (PICs), such as Cook Islands, Fiji, Kiribati, Micronesia, Samoa, Solomon Islands, Tonga, and Vanuatu, participated in this training programme (See Annex 1 for list of participants for the training).

This training was a key activity of the project on "Strengthening multi-hazard risk assessment and early warning systems with applications of space and geographic information systems in Pacific island countries". Objectives of the training were as follows:

a. To enhance institutional and technical capacities of the PICs for operating and managing geo-portals and geo-databases and GIS tools, including remote sensing technologies, for early warning and disaster risk reduction
b. To develop a mid-term national action plan for implementing and operating geo-portal and geo-database in the participating PICs as a long-run strategy for sustainability

2. TRAINING TOPICS

This training programme was held for four weeks. Key topics covered each week are given as below (See Annex 2 for detailed training programme):

- Week 1
  - Opening session
  - Introduction to key concept of national action plan
  - Introduction to web-based geo-portal: Setup, usage, functionalities, metadata, and thematic mapping

- Week 2
  - GIS framework for decision-making to support early warning and disaster risk reduction: Concepts, case studies, applications for decision making especially for disaster risk reduction, free data sources
  - Introduction to geo-database: Concept, installation and management of geo-databases (PostgreSQL/PostGIS), accessing geo-databases (CLI, pgAdmin GUI)

- Week 3
  - Remote sensing: Concepts, case studies, free data sources
  - Sentinel Asia project by JAXA representative
  - Development of draft national action plans
  - Mapping with drone: Operating unmanned aerial vehicles (UAV) and image processing
- Week 4

- Geo-portal administration: customization, backup and restore, adding external WMSs and base maps
- GIS practices for disaster risk reduction by UNOSAT
- Procedural guidelines for emergency response by ESCAP
- Wrap-up discussion on lessons learned by the participants

3. KEY ACHIVEMENTS

3.1 Enhanced capacity for development of geo-portal and geo-database

During the training programme, participants had an extensive hands-on experience on complete implementation cycle of geo-portal and geo-database from installation, customization, management, and maintenance. A Free and open source geo-portal called GeoNode was used as a geospatial data sharing platform. A desktop computer was provided to each participating country to build customized geo-portals according to their national context. After the training, the participants from six PICs, including Fiji, Kiribati, Micronesia, Samoa, Tonga and Vanuatu, took the computer with geo-portal installed back with them to their countries to avoid repetition of the entire geo-portal implementation process.

After installing country-wise geo-portals, the participants uploaded country-specific datasets that are in compatible formats to be uploaded on their geo-portal. The participants learned how to classify different types of data to improve the representation of shared data. They also learned how to backup and restore geo-portal and the uploaded datasets to ensure the sustainability of the geo-portals (See Annex 3 for snapshots of the country-level geo-portals developed during the training).

3.2 Enhanced capacity to use geospatial data and technology for early warning

Based on the pre-training gap and needs assessment survey, the participants learned more about basics and applications of geospatial technologies for disaster management. Sessions from second to third week covered topics on analyzing geospatial data, including remote sensing data, and using different geospatial technology applications for early warning and disaster risk reduction. Case studies were also included, such as identification of suitable location for public facility as disaster shelters, flood hazard mapping, rainfall analysis, and building damage assessment. Emerging geospatial applications, such as mapping from UAV, advance use of Google Earth, and field data collection using mobile application were newly added to the training programme upon request from the participants.

Regional disaster management frameworks including Sentinel Asia and International Disaster Charter were introduced to the participants for better understanding on flow of geospatial data for emergency response and recovery at the regional level and for accessing to high resolution satellite data for free of charge.

3.3 Development of draft national action plans for geospatial information system and disaster risk reduction

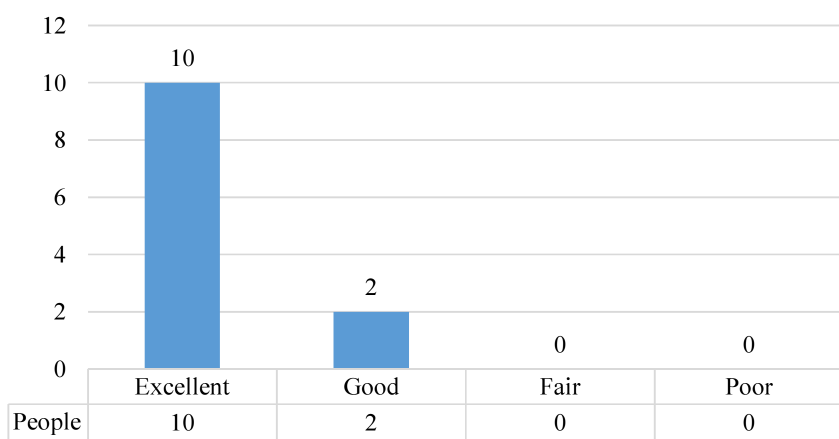
The participants discussed on the concept, purpose, and possible components of a national action plan on GIS for early warning system. A brief guideline and template was provided for the participants to develop their mid-term national action plan throughout the training duration, according to their country's political and socio-economic contexts (See Annex 4 for the guideline).

During the closing session, the participants presented their draft national action plan and key areas their countries need to focus. Some key identified actions on the plans commonly discussed by the participants include finding server hardware to install the geo-portals, finding experts to guaranty the effective usage and sustainability of the systems, and receiving the support from other agencies by establishing institutional agreements. The participants will share the updated draft of the national action plan for each country by end March 2017.

4. EVALUATIONS AND LESSONS LEARNED

The whole training programme was successfully completed with good results, as shown from the training evaluation form and self-assessment survey by the training participants (See annex 5 and 6 for full responses from the participants).

Summary of the overall evaluation of the training is as follows:



A few comments on the training from the participants' evaluation sheets:

- Helpful and informative courses provided during the training to improve understanding and application of geo- portal and geo-database for early warning system and disaster risk reduction

- Prompt reflection of the participants' request on adding sessions on emerging GIS applications for early warning and disaster risk reduction
- Supportive and user-friendly training materials
- Efficient delivery of the training contents

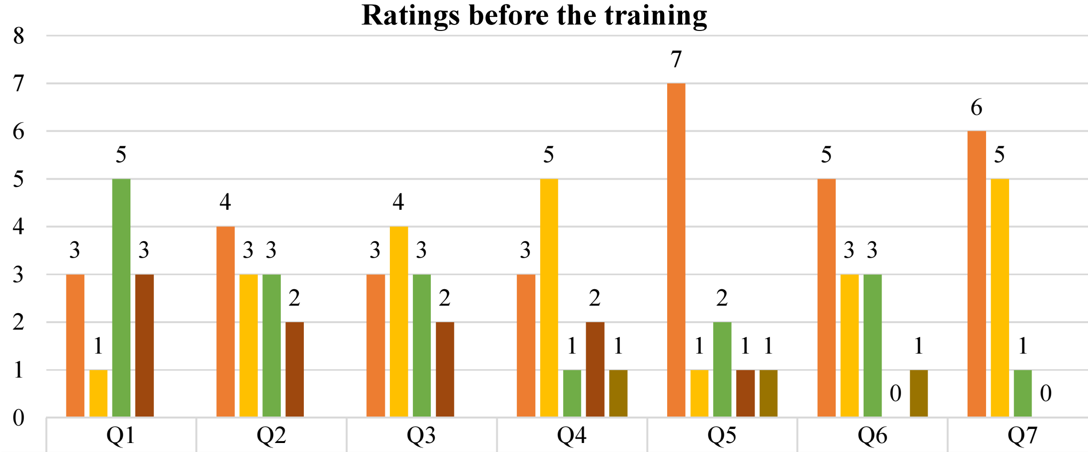
The self-assessment was conducted to ensure whether the training programme was designed to practically support the participants' knowledge and competency. Following questions were asked to rate the self-assessed competency by the participants before and after the training.[1]

Knowledge and Comprehension	**Q1**	Describe basic concepts of GIS, remote sensing, and web GIS
	Q2	Outline components and structures of national GIS for disaster risk reduction
Application & Analysis	**Q3**	Collect and manage appropriate geospatial data to maintain quality of the national GIS for disaster risk reduction
	Q4	Analyze and apply geospatial analysis results through visual communication (e.g., map) to support decision making process on disaster risk reduction
	Q5	Install and manage customized open source geo-portal/geo-database for disaster risk reduction
	Q6	Operate open source geo-portal/geo-database for generating map and sharing geospatial data for disaster risk reduction
Synthesis & Creation	**Q7**	Draft a mid-term national action plan on GIS for disaster risk reduction

Level of self-confidence for each question was measured on a scale of 1 to 5, where 1 as not confident to conduct the activity without external guideline/manual, 3 as confident to conduct the activity with external guideline, and 5 as confident to conduct the activity without external guideline. The following graph shows a summary of the change in self-confidence of the participants for each topic before and after the training.

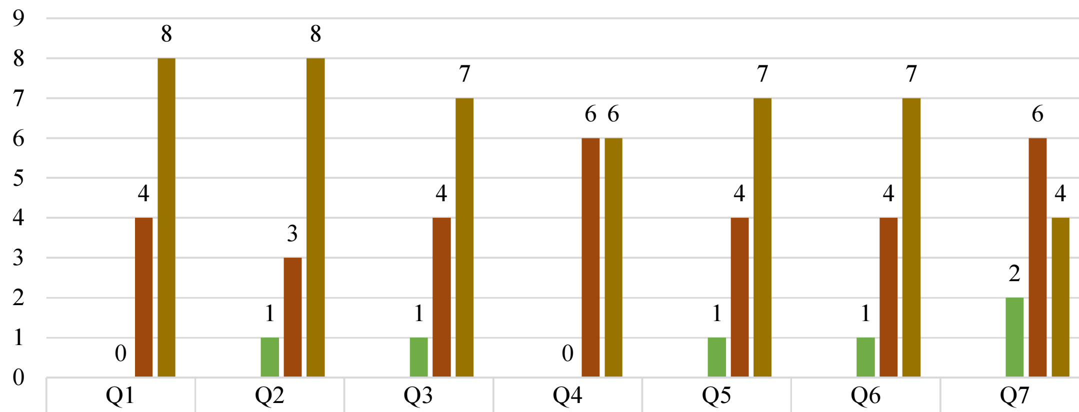
[1] This self-assessment was drafted based on the learning objectives which are constructed based on Bloom's Taxonomy.

Ratings before the training



Ratings	Q1	Q2	Q3	Q4	Q5	Q6	Q7
1	3	4	3	3	7	5	6
2	1	3	4	5	1	3	5
3	5	3	3	1	2	3	1
4	3	2	2	2	1	0	0
5	0	0	0	1	1	1	0

Ratings after the training



Ratings	Q1	Q2	Q3	Q4	Q5	Q6	Q7
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	1	1	0	1	1	2
4	4	3	4	6	4	4	6
5	8	8	7	6	7	7	4

The results showed a significant improvement of the knowledge after attending the training. A closer view of the ratings before and after the training show:

- For all seven questions, more than 75% of the participants described their level of self-confidence as not confident to conduct the activity without external guideline to confident only with external guideline before the training.
- For the same seven questions, more than 83% of the participants showed change in their level of self-confidence as confident to conduct the activity without external guideline after the training.

The following tabular representation provides more detail view of the ratings.

		Before the training (%)					After the training (%)				
Rating		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Knowledge and Comprehension	**Q1**	25%	8%	42%	25%	0%	0%	0%	0%	33%	67%
	Q2	33%	25%	25%	17%	0%	0%	0%	8%	25%	67%
Application & Analysis	**Q3**	25%	33%	25%	17%	0%	0%	0%	8%	33%	58%
	Q4	25%	42%	8%	17%	8%	0%	0%	0%	50%	50%
	Q5	58%	8%	17%	8%	8%	0%	0%	8%	33%	58%
	Q6	42%	25%	25%	0%	8%	0%	0%	8%	33%	58%
Synthesis & Creation	**Q7**	50%	42%	8%	0%	0%	0%	0%	17%	50%	33%

Evaluation results and key lessons learned from the training sessions would support and enhance the quality of:

- In-depth understanding and analysis of current situation and identified gap in the Pacific Island countries to operate and manage their geo-portal and geo-databases for early warning and disaster risk reduction
- Draft of pilot project implementation plan, including the selection of the target pilot countries and detailed activities designed for each country (e.g., advanced operation of geo-portal, on-site training provided to technical staffs, discussion with policy makers on sustainable operation of geo-portal)

5. NEXT PLAN

Key results and lessons learned from the training will be fully reflected on the implementation plan of pilot projects in Pacific Island countries. According to the plan, an expert from AIT will assist around three Pacific Island countries as pilot and work with them for one month each. During the stay, the AIT expert will work with the government officials and local experts to install and configure the geo-portals and geo-databases by uploading more verified datasets and to conduct capacity building training.

The countries for pilot projects will be selected mainly by analyzing the national action plan of each country. Further, the interest and commitment shown during the capacity building training at AIT will be considered for this selection. Based on the enthusiasm shown by the participants during the training, one to two additional countries may be added to the pilot projects according to their current situations and updated draft national action plan, subject to a total project budget availability. The

candidates for the pilot projects and more details will be included in the implementation plan of the pilot projects.

- Submission of implementation plan for pilot projects: 31 March 2017
- Conducting the pilot projects: June-September 2017