The Regional Network Office for Urban Safety (RNUS)

Monthly Report (September 2024)

Report to STE/SET

Prepared by RNUS

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Contents

1.1 Summary

This report summarizes the activities done in RNUS office during the month of June 2024. Progress has been summarized in the following orders:

1) RNUS Outreach Activities
2) RNUS Office Procurement Update
3) Progress on Research Activities
    - Meeting with RIMES team for satellite-based flood map and LiDAR drone flying
    - Structural Health Monitoring with remote sensing techniques
    - Study on post-disaster recovery dynamics
    - Land-use Optimization tool for tsunami-prone areas
4) Support in STE's Student Research
5) Plans

1.2 RNUS Outreach Activities

As part of RNUS outreach activities, the 3rd RNUS Seminar series is being planned for 22nd and 29th November 2024. Tentative keynote speakers will be Prof. Takeuchi (IIS, UTokyo), Meteorologist & GIS Analyst from RIMES and Prof. Miho Ohara (IIS, UTokyo) with the topics related to flood forecasting and monitoring which is currently implementing in their research. Topics and date will be confirmed and announced later in end of this month through RNUS official website News Archives - Regional Network Office for Urban Safety (ait.ac.th).

1.3 RNUS Office Procurement Update

DJI D-RTK 2 High Precision GNSS Mobile Station was procured by W.Takeuchi lab in IIS, UTokyo and the device and accessories were brough to RNUS office on 10 September 2024. Drone flying for checking connection of D-RTK 2 Mobile Station and Matrice 350 RTK was tested inside AIT campus on 13th & 17th September 2024, and it went well. D-RTK 2 Mobile Station and Matrice 350 RTK drone can now be used for LiDAR drone flying for the cases of DEM generation for RIMES and Oil Palm in Prachuap province.

Fig-1 Drone flying for checking connection of D-RTK 2 Mobile Station and Matrice 350 RTK

There's only one set of battery for DJI Matrice350 LiDAR drone which can accommodate around 30 minutes flight time in maximum. Therefore, one more battery set (two pieces) will be procured from RNUS office. Two more high-speed write capacity SD cards and other accessories such as portable chairs and sheet necessary for field trip have also been procured.

1.4 Progress on Research Activities

1.4.1 Satellite-based flood map (support in RIMES's project)

Prof. Takeuchi is supporting satellite-based flood map for RIMES' project areas (Ta Chang province) and discussion is on going with RIMES team for further consultation (via email as necessarily). RNUS office will also provide technical assistance in LiDAR drone flying and DEM preparation which will be used for flood model updating. Tentative dates for LiDAR drone flying in Ta Chang province is either in 1st week of November or in 1st week of December.

1.4.2 Water level measurement with low-cost device for CH4 emission mitigation in Thailand

Currently, total 4 sensors (2 Rynan, 2 Faro) were installed in paddy filed inside Royal Irrigation Agriculture Experiment Station 5 (Mae Klong Yai) Thung Khwang, Kamphaeng Saen District, Nakhon Pathom 73140. Sensors are continuously monitoring through dashboard and research is ongoing in satellite-based analysis part.

Fig-2 Water Level monitoring through installed sensors and web dashboard (sample)

1.4.3 Structural Health Monitoring with remote sensing techniques

Remote-sensing based land subsidence analysis and effect to linear infrastructure have been completed for Bangkok City and Chiang Mai City areas. Validation parts for correlation with land instability and infrastructure damage (either literature review or field survey) will be continued in coming months. Web dashboards for land instability result for both cities can be accessed from these links (https://u-tokyo.maps.arcgis.com/apps/instant/sidebar/index.html?appid=ac0af73ba0a848eb807133abd803383e & https://u-tokyo.maps.arcgis.com/apps/instant/sidebar/index.html?appid=cb2797e1f580448ca25edf3bfacc76da).

1.4.4 Post-disaster recovery dynamics

Research on “Post-disaster recovery dynamics” is progressing with work on the sub-research topic on Recovery simulation modelling presented by Dr. Yasmin at the 14th International Symposium on Architectural Interchanges in Asia (ISAIA) in Kyoto, conducted by the Architectural Institutes of Japan, Korea and China. The presentation was on “*Recovery Modelling for Recovery Planning*” at a Special theme session which also included experts in resilience from Korea and China. Positive feedback was attained regarding the research output and research collaboration was strengthened with potential future collaboration with professors from Korea University.

Fig 3- ISAIA Resilience and Recovery theme session, Kyoto

1.4.5 Land-use optimization tool for tsunami prone areas

Ongoing work by Dr. Yasmin regarding the development of land use optimization tool is underway with three preliminary locations identified in Phuket for further consideration. These are: Patong Beach, Kamala Beach, and Bang Tao Beach and their surrounding areas. Evaluation of the 2030 Urban Planning Master Plan for Phuket is currently underway to determine feasibility of land-use regulation implementation for the region. The of the region is identified along with the expected tsunami inundation, and current planning scenario in Fig. 4 (from top: Bang Tao, Kamala, and Patong beach areas). In depth analysis of the land-use regulations currently available in Thailand and those to be implemented in the Phuket region will be carried out next including field survey.

Developmental work on the optimization tool is also underway with the help of student assistant employed for this project.

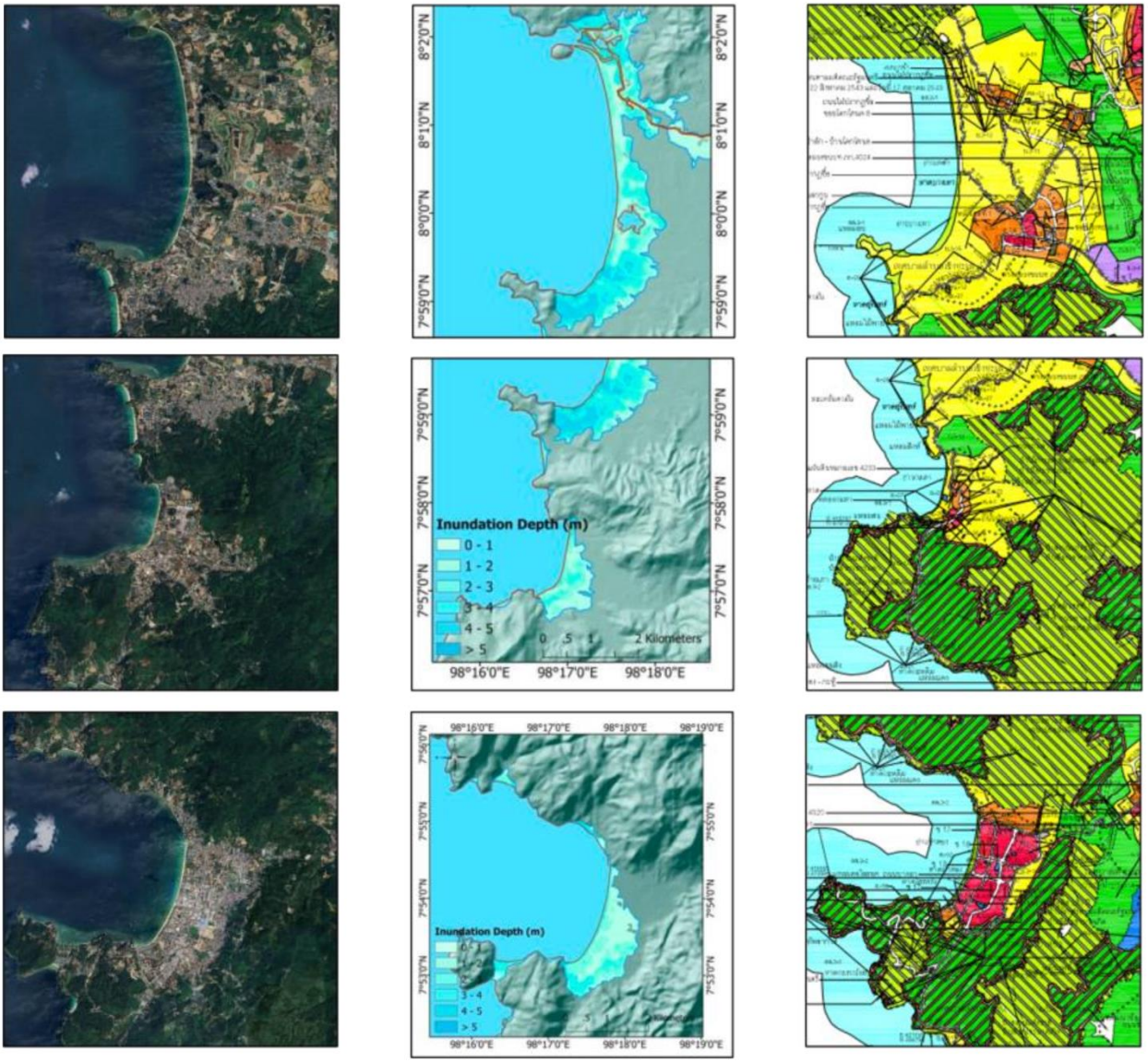

Fig 4- Bang Tao, Kamala and Patong beach areas (left) in Phuket and their tsunami risk(middle) and current planning strategy (right)

Current student assistantship status for projects supervised by Dr. Yasmin:

Assistantship Topic	Activities	Hours worked	
		No. of student	hours worked (200thb/hr)
Optimization tool development	Programming	1	30 hrs (September)
Nepal recovery research	Literature review of policy documents in Nepali and data collection	1	15hrs (July)* 15hrs (August)* 15hrs (September)

*Outstanding timesheets approved in September

1.5 Plans

The 3rd RNUS Seminar Series will be conducted on 22nd and 29th November 2024. Detailed schedule, speakers and topics will be confirmed in coming weeks.

LiDAR drone flying will be done in oil palm field in Prachuap province on 10th and 11th October 2024. Prof. Takeuchi, Dr. Khin and Ms. Metta will join the field trip.

Dr. Khin will be out of RNUS office from 4th ~15th November 2024 to deliver lectures in IIS, UTokyo.

Dr. Yasmin will be out of office from 28th October 2024 ~ 1st November 2024 to attend ACE (Architecture and Civil Engineering) Congress in Seoul, Korea.