

Prevention of 4 Disasters and Their Single Recovery Networks based on Internet-Of-Things with Airborn Capability (PATRIOT-41R-Net)



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Abstract

This project is highly motivated by the very high probability of disaster occurring in ASEAN countries beside the Africa with vulnerability of between 51.71% - 74.36% based on the study of United Nations in 2006. The recent earthquakes in Palu, Sulawesi, Indonesia and tsunami at Pantai Carita of Banten, urgent us to realize our developed algorithm of coded random access. This PATRIOT-41R-Net project includes drone as the flying relay helping victim to have wireless connections as well as finding them in the location where the risk is high for rescue team to find.

This PATRIOT-41R-Net project plans to make an experiment at Padang City, Sumatera, Indonesia as the place experienced earth quake and tsunami several years ago. Padang is selected as the place for experiment because the city is concerning a lot the disaster and is developing the advanced technologies for disaster monitoring and recovery. With this project, the people can have direct access to the level of danger in nature for more well prepared.

PIC and WP Duration

- **WP1: Coordination and Preparation**
(PIC: Anwar, Ashwin),
Time: June 2019 – May 2021
- **WP2: Flooding Sensor**
(PIC: Norulhusna),
Time: June 2019 – November 2019
- **WP3: Landslided Sensor**
(PIC: Dao),
Time: June 2019–November 2019
- **WP4: Earthquake Sensor**
(PIC: Kurkoski),
Time: June 2019 – November 2019

Network Structure

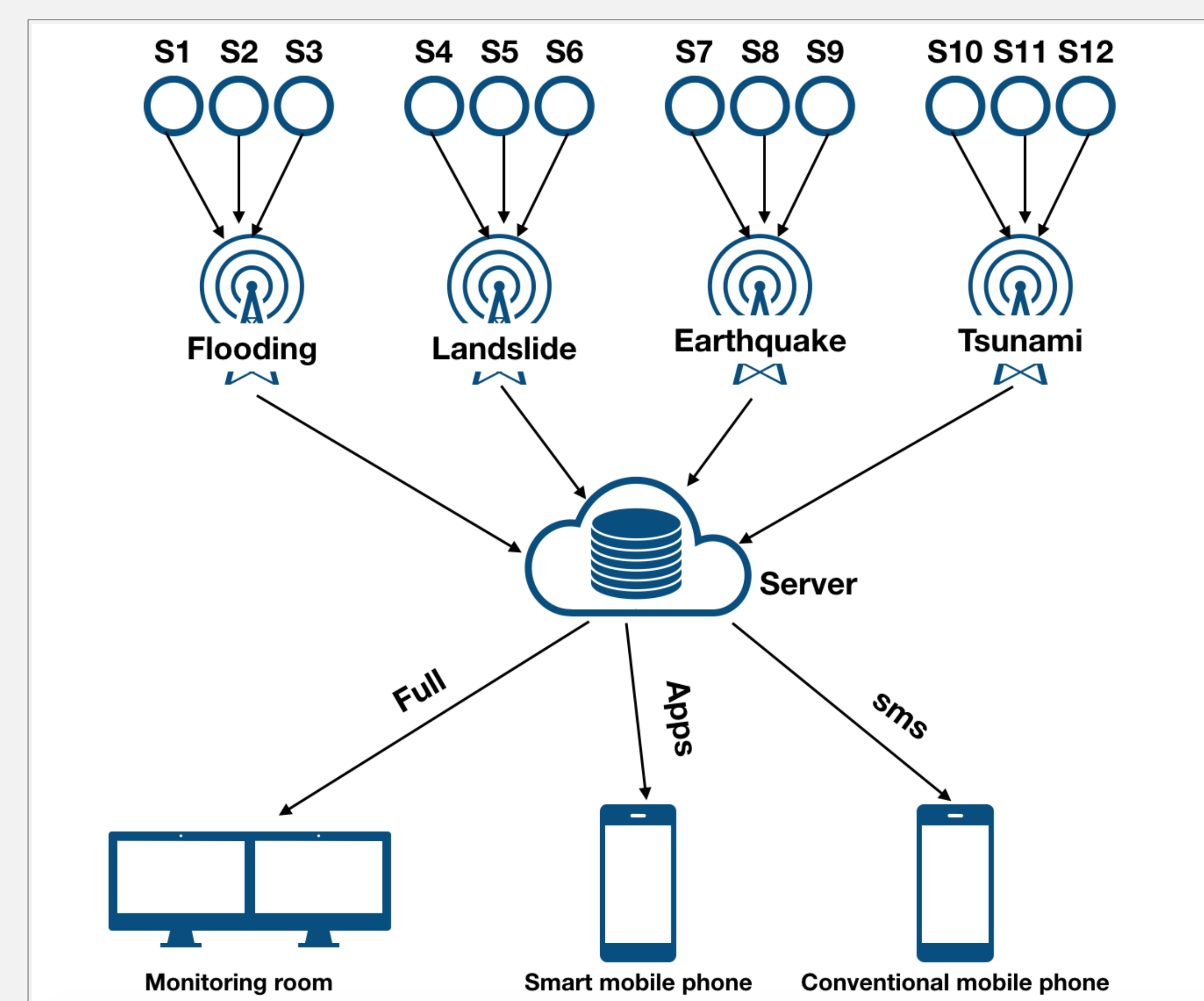


Figure: Network structure for monitoring of disaster occurrence having capability of managing 4 disaster probability in a single network.

Work Packages

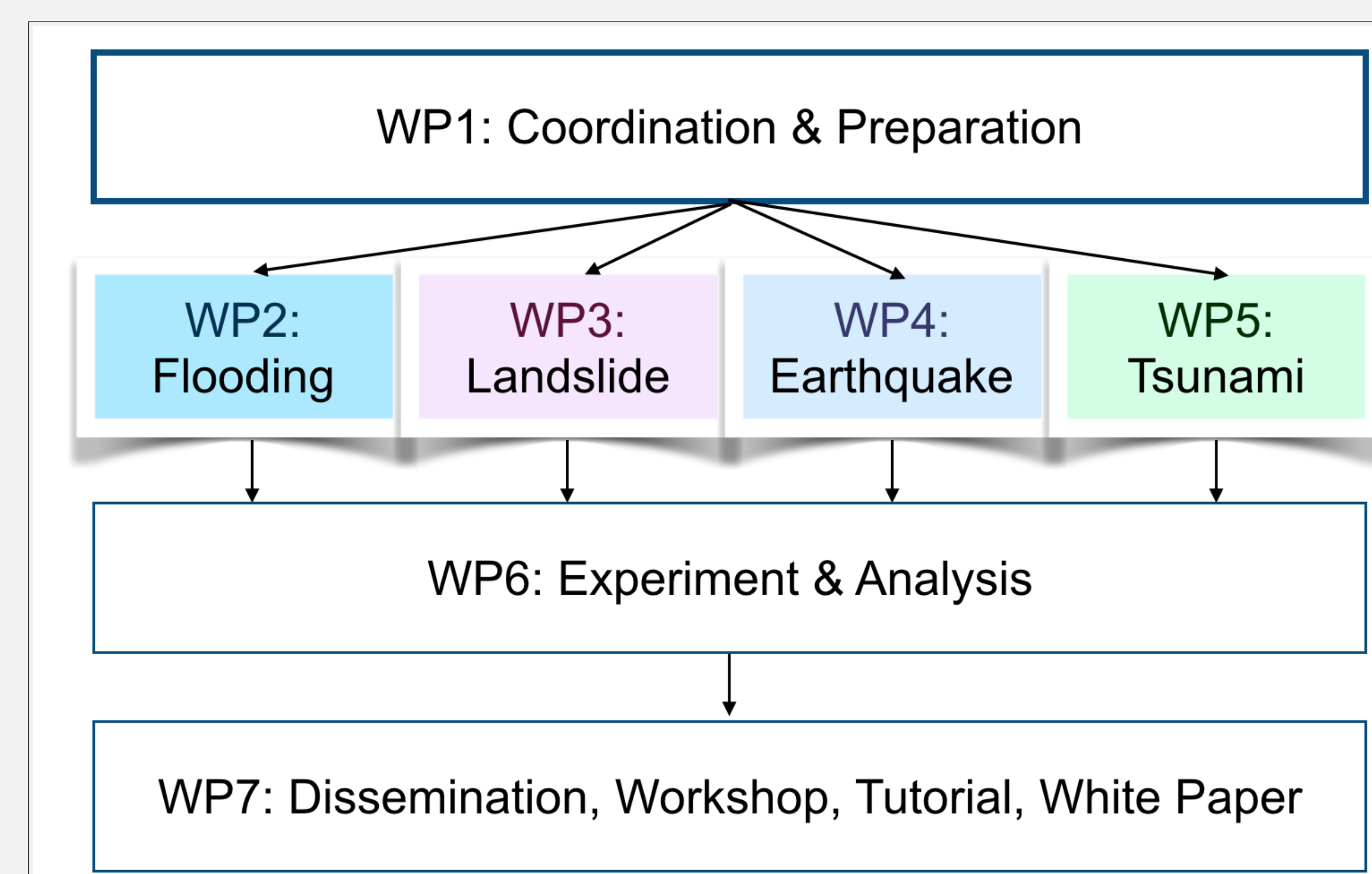


Figure: Work Packages of PATRIOT-41R-Net, where some WPs may work in parallel.

Outcomes

- (1). A wireless network involving 4 types of sensors providing real-time information of environment before and after the disasters. The networks capability is demonstrated by the accessibility of 4 types data from all sensors, i.e., (1) flooding, (2) landslide, (3) earthquake, and (4) tsunami, from smartphones and monitoring room.
- (2). Application APPS and SMS services for smartphones and conventional phone, respectively.
- (3). Lesson learned from real-field experiment and real-field parameters in the form of report about validity and reliability of good wireless technologies used for disaster and mitigations. These lessons are expected to be documented in a video and white paper including message from Drone.
- (4). Publications in IEEE magazines or other journal/transaction or magazine, where practical experiences are highly encouraged.

PIC and WP Duration

- **WP5: Tsunami Sensor**
(PIC: Attaphongse),
Time: June 2019 – November 2019
- **WP6: Experiment of Mitigation with Drone and Analysis**
(PIC: Anwar),
Time: October 2019 – April 2021
- **WP7: Dissemination, Workshop, Tutorial, Whitepaper**
(PIC: All),
Time: March 2020 - May 2021