Project Leader: Dr. ONG Hong Hoe (MIMOS)
Project members: LUKE Jing Yuan (MIMOS), Dr. Kanokvate Tungpimolrut (NECTEC), Prof. Myint Myint Sein (UCSY), Asst Prof Linh Truong Dieu (HUST), Dr DINH Van Dzung (VNU), Dr. Alejandro H. Ballado Jr. (MAPUA), Jelina Tanya H. Tetangco (ASTI), Dr. Jason Haga (AIST), Hiroaki Yamanaka (NICT), Prof LEE Bu Sung (SingaREN)
Budget: USD116,000
Duration: April 2016, 3 years

Target of this project: This project addresses the impact of climate change on cities and urbanization, with particular relevance to the priority area of improving environmental resilience and more specifically in disaster mitigation. This collaboration proposes a flexible and robust distributed framework for disaster mitigation, crisis communication and emergency management that can monitor disaster events in near-realtime, based on computational platforms, ranging from automated weather sensors, water gauges, smartphones and laptops, to remote computing and data storage platforms. – the platform would be based on dual-use infrastructure using the latest Software Defined System technologies. The proposed forum will find critical technologies, use cases and develop and deploy collaborative platform in ASEAN region. Use of NICT's existing testbeds such as JGN-X, Starbed and JOSE will have great leverage of research and development. Collaborating with already funded activities in each institution as well as outside projects such as PRAGMA (NSF, US), CENTRA (NSF, US) and CECEA (Taiwan), we can accelerate our activities.

Findings and Outcomes:
Initial studies indicate that Software Defined Systems can provide potential solutions to setup a resilient infrastructure to support activities in smart cities and disaster management.
It is possible in a foreseeable future that a regional SDN based network infrastructure can provide the necessary resilient infrastructure to support activities for smart cities and disaster management.
An important outcome of such resilient infrastructure can only be fully explored when more applications are researched and developed that allow collaborative monitoring and sharing among cities and even countries in ASEAN.
As such a blueprint for such activities is proposed.
(Please refer full report for detail)

Collaborations:
All project members used and contributed their own resources for the project activities, no additional hardware/equipment were acquired using project funding. Resources contributed by members in 3 activities are detailed in the final report.

Broader Impact and Future Developments:
By using the programmable capabilities of the underlying network infrastructure, i.e., SDN/NFV and Distributed Object Storage technologies, we can foresee that during an outage due certain disaster, different centers from different cities can share the load as the data can still be collected and shared with redundancy from the wide area software defined storage and that monitoring/planning/decision making/etc. can be made using the collaborative visualization.
Further developments can be considered in the following areas:
Intelligent Dynamic Routing in SDN-IP backbone; IoT Security; Network Function Virtualization for IoT; Intelligent Secure Edge Computing Deployment for IoT; Applications for emergency management ;Edge Computing and Edge Analytics

Social Contribution:
A total of 15 relevant publications published; 7 presentations ; 2 demos made
(Please refer to full report for details)