

## Progress Report of WCoE 2017

1. Short Title of WCoE : Development of Community-based and Most Adaptive Technology for Landslide Risk Reduction
2. Name of Institution : Faculty of Engineering, Universitas Gadjah Mada (UGM)  
Name of Leader : Prof. Teuku Faisal Fathani and Prof. Dwikorita Karnawati  
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3. List of core members:
  - a. Dr. Wahyu Wilopo (Geological Engineering, Faculty of Engineering UGM, Indonesia)
  - b. Dr. Agung Setianto (Geological Engineering, Faculty of Engineering UGM, Indonesia)
  - c. Suharman (Faculty of Social and Politic Science, Universitas Gadjah Mada, Indonesia)
  - d. Budi Andayani (Faculty of Psychology, Universitas Gadjah Mada, Indonesia)
4. Progress report of activities up to 31 December 2017 (up to 30 lines)
  - A. Research development and delivery to the community and government policy, which includes various activities as below:
    - a. Investigation, hazard and risk mapping, and implementation socio-technical approach for landslide EWS at 30 provinces in Indonesia on January-December 2017. And further implementation of Landslide EWS at Papua Island, Kalimntan Island in Indonesia and in Timor Leste.
    - b. Publishing ISO 22327 for Landslide EWS during ISO TC-292 Meeting in Sydney, Australia on March 2017; based on the result of the technical meeting in Edinburgh UK 2016 and Jeju Island Korea 2017.
    - c. Establishment of National Master Plan for Landslide Mitigation in Indonesia and National Standard for Landslide EWS conducted in partnership with National Agency for Disaster Management (BNPB), Ferbruary – December 2016.
    - d. Field investigation and local/ national government empowerment for landslide and debris flood mitigation at several provinces in Indonesia, on January- December, 2017.
    - e. Field investigation and community empowerment for landslide mitigation in Central Java and East Java, in collaboration with DPRI Kyoto University and AUN/ Seed Net at the Field of Geological Engineering and Natural Disaster, as a part of Landslide School Network Program.

f. Geotechnical and Geological Investigation for Landslide Mitigation in South Sumatera, Central Sulawesi, East Java, Central Java and West Java Provinces.

B. Research Development and Implementation to the industry (i.e. "PERTAMINA" the national oil, gas and geothermal company, MEDCO Energy and Freeport Indonesia) for implementing the Landslide Early Warning System in Geothermal Fields, hydro-power plant and mining area across Indonesian Region, such as in Java, Sumatera, Sulawesi, Kalimantan and Papua. This is an extended effort in the implementation of Landslide Early Warning System which was mainly applied for mining companies, including: PT. INCO Sorowako, PT. Arutmin and Myanmar (United Mercury Group - UMG), as well as preliminary consultation on slope stability at Karst mining site with PT. Holchim.

C. Capacity Development Program (Research-based) :

- a. Delivering the National Workshop on Landslide Risk Reduction and Response, at Central Sulawesi, West Nusa Tenggara, West Sumatera and Bengkulu, on January-December 2017.
- b. Regular Workshop on Landslide and Geohazard Mitigation to support the resiliency of Geothermal Industries, sponsored by PERTAMINA (Indonesian Oil and Gas Company) and MEDCO Energy International.
- c. Landslide and Geological Disaster Risk Management Workshop and Fieldtrip with respect to the Local Government Capacity Building Program, conducted in Padang-West Sumatera, Palu-Central Sulawesi, Mataram-Nusa Tenggara Barat and Bengkulu (in collaboration with GNS Science New Zealand, NZ-Aid and National Agency for Disaster Management).
- d. Collaborative research on landslide mitigation and risk management has been conducted with Ho Chi Minh City University in Vietnam, National University of Laos in Laos, and Yangon University Myanmar in Myanmar, funded by ASEAN University Network/ South East Asian Engineering Education and JICA
- e. Joint supervision for master and doctoral students research, partnership between Faculty of Engineering UGM - Kyoto University, Japan and also with San Diego State University, USA (which is integrated to the collaborative research) in disaster mitigation of ASEAN region (2004- now).
- f. Public Education and Community Empowerment in Landslide Prone Area in Karanganyar and Banjarnegara Regency, conducted through Student Community Service for Landslide Mitigation in Indonesia (since 2009-now)
- g. International summer program (student field visits) in landslide, debris flood, laharcic and volcanic disaster area in Indonesia with the participant from UGM, Australian Universities, British Universities and Japan Universities.

- h. Providing training modules, documentary film, pamphlet (poster, calendar, and leaflet) for supporting the public education in landslides mitigation and preparedness.

5. Plan of future activities (up to 30 lines)

- a. Maintenance and enhancement of the existing EWS system (socio-technical system) by enhancing the online and telemetry system and by up-scaling the system to the national and regional levels, will be conducted as a partnership program with Pacific Disaster Center, the University of Hawaii and the US Pacific Commander.
- b. Development of Smart Grid as Crowd Sourcing Technology for Community and Cyber-based Landslide Early Warning System in Karanganyar and Banjarnegara Districts, Central Java.
- c. Continue to regularly carry out the Student Community Service for Disaster Mitigation, conducted every summer time, with the extended participant from University of Hawaii and may also from UNESCO Youth for Ambassador.
- d. Supporting the local government of West Sumatera, Central Sulawesi, Nusa Tenggara Barat and Bengkulu Province for the Enhancement of Disaster Risk Reduction System, such as through the Collaboration with New Zealand Ministry of Foreign Affairs (MFAT) and also GNS Science New Zealand.
- e. Joint supervision for master and doctoral student research (which is integrated to the collaborative research) in Landslide disaster mitigation, supported by ASEAN University Network/ South East Asian Engineering Education and JICA as well as with Department of Geological Sciences, San Diego State University, USA.

6. Publication (in Landslides, proceedings, meeting reports, or WEB)

1. Fathani T.F., Karnawati D., 2018. A landslide monitoring and early warning system. *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools*, Springer: 297 – 308.
2. Karnawati D., Fathani T.F., 2018. A socio-technical approach for landslide mitigation and risk reduction. *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools*, Springer: 621 – 630.
3. Karnawati D., Fathani T.F., Wilopo W., Andayani B., 2018. Community hazard maps for landslide risk reduction. *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools*, Springer: 599 – 606.
4. Fathani T.F., Karnawati D., Wilopo W., 2017. Promoting a global standard for community-based landslide EWS. *Advancing Culture of Living with Landslides*, Springer, Vol. 1: 355 – 361.
5. Fathani T.F., Legono D., Alfath M.A., 2017. Sensitivity analysis of depth-integrated numerical models for estimating landslide movement. *Journal of Disaster Research*, June 2017, Vol. 12(3): 607 – 616.
6. Fathani, T.F., Karnawati, D., and Wilopo, W. (2016) An integrated methodology to develop a standard for landslide early warning systems. *Natural Hazards and Earth System Sciences* 16(9):2123-2135.
7. Fathani TF., Wilopo W., Karnawati D. (2015) Developing a National Standard for Landslide Early Warning System, the 13rd International Workshop on Geo-disaster Reduction, August 2015.

8. Karnawati D., Fathani, TF., Wilopo W.: “The Development of National Master Plan for Landslide Mitigation in Indonesia”, the 5<sup>th</sup> International Workshop on Multi-modal Sediment Disaster, Tainan, Taiwan, October 2014.
9. Fathani TF., Karnawati D., Wilopo W.: “The Most Adaptive and Sustained Landslide Monitoring and Early Warning System”, Proceeding of 3<sup>rd</sup> World Landslide Forum, Beijing, June 2014.
10. Fathani, T.F., Karnawati, D., and Wilopo, W., 2014. An Adaptive and Sustained Landslide Monitoring and Early Warning System. *Landslide Science for a Safer Geoenvironment*. p. 563-567.
11. Karnawati D., Ma’arif S., Fathani TF., Wilopo W.: “Development of Socio-technical Approach for Landslide Mitigation and Risk Reduction Program in Indonesia”. *ASEAN Engineering Journal Part C, Vol. 2 Number 1, ISSN 2286-8150*. June 2013, p. 22 – 47 C.
12. Karnawati D., Wilopo W., Setianto A., Suharman and Fathani TF.: “Student Community Service Program for Landslide Disaster Risk Reduction in Indonesia”. *Landslide Science and Practice, Volume 7: Social and Economic Impact and Policies*. p. 317 – 323. Editors : Claudio Margottini • Paolo Canuti • Kyoji Sassa.
13. Fathani TF and Karnawati D.: “Progress on the Development of Real-time Monitoring and Early Warning of Landslide”. Proceeding of IPL Symposium, Kyoto, November 2013.
14. WCoE of Landslide Risk Reduction of UGM: “National Master Plan for Landslide Mitigation in Indonesia”, Eds. Fathani TF, Wilopo W. and Karnawati D. National Agency for Disaster Management of Indonesia, Dec 2013.