

IPL Project Annual Report 2018

January 2018 to 31 December 2018

1. Project Title: Development of Education Program for Sustainable Development in Landslide Vulnerable Area through Student Community Service (IPL-159)
2. Main Project Fields: Capacity Building (Higher Education Program for Landslide Disaster Risk Reduction) conducted in conjunction with IPL Project No IPL-140, IPL-158 and IPL-165.
3. Name of Project leader: Dr. Wahyu Wilopo. Dwikorita Karnawati
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Core members of the Project: Names/Affiliations: (4 individuals maximum):
 - a. Prof. Teuku Faisal Fathani, Faculty of Engineering UGM. Center for Disaster Mitigation and Technological Innovation (GAMA-InaTEK) Universitas Gadjah Mada, Indonesia
 - b. Prof. Dwikorita Karnawati, Faculty of Engineering UGM and the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), Indonesia
 - c. Dr. Hendy Setiawan, Faculty of Engineering UGM. Center for Disaster Mitigation and Technological Innovation (GAMA-InaTEK) Universitas Gadjah Mada, Indonesia
4. Objectives: (5 lines maximum)
Capacity building of students as the future leaders/ decision makers/ researchers for sustainable development through enhancement of learning program in higher education, which providing opportunity for the students to :
 - a. Implement of their knowledge and skill for landslide mitigation and risk reduction.
 - b. Develop ethical values and spirit of sustainable development with respect to landslide risk reduction (development of various skill such as adaptability, flexibility, tolerance, team working and empathy through community empowerment activities for landslide DRR).
5. Study Area: (2 lines maximum):
Indonesia, where the activity in 2018 was conducted in (1) Central Java, (2) West Java, (3) East Java, and (4) Sulawesi, Indonesia
6. Project Duration (1 line maximum): 2009 – 2019.

7. Report

1) Progress in the project: (30 lines maximum)

This Education Program has been carried out every year since 2009 through the Student Community Services Program of Universitas Gadjah Mada, which was initiated under the sponsor of Indonesian Controlling Agency for Oil and Gas Industries (BP MIGAS), the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), as well as by The British Council under the DelPhe Program (Development of Partnership in Higher Education Program), Pacific Disaster Center (PDC) and International Consortium on Landslides (ICL). Additional support was also provided by Universitas Gadjah Mada and the Indonesian Ministry of National Education and Culture and National Disaster Management Agency (BNPB), by providing a special Grant to facilitate the Education for Sustainable Development Program, and from the Ministry of Foreign Affairs and Trade (MFAT), New Zealand through StIRRRD Program: <https://stirrrd.org/>

The last activity of this education program was conducted in June-August 2017 and June-August 2018, when about 300 undergraduate students with various disciplines were deployed in Central Java, West Java, East Java and Sulawesi Provinces, for conducting a Student Community Service Program, with a special mission to mitigate and reduce the risk of landslide in order to protect the structures and infrastructures in those respective villages and districts. By implementing this program, the students' knowledge and skill for landslide mitigation can be improved, by exposing them to the real landslide hazard problems, which requires several prevention and mitigation actions such as establishment of landslide hazard maps to support landuse management and also community empowerment program, which include the public education for landslide awareness, prevention and mitigation. Accordingly, a special training and evacuation drill to empower the local community for implementing the landslide mitigation works. Besides, the landslide early warning system was also carried out in parallel with the installation of landslide EWS equipment devices, which complied with SNI-8235-2017 and ISO 22327:2018.

2) Planned future activities or Statement of completion of the Project (15 lines maximum)

- a. Continuing the student community service as the regular program during summer term by applying similar actions for the villages in Yogyakarta Special Province, Central Java Province, West Java Province, East Java Province, Sulawesi and other provinces in Indonesia.
- b. Establish a collaborative action research with Pacific Disaster Center – University of Hawaii and the Visualization Center – San Diego State University, California, USA to implement smart grid (a cyber and community-based landslide hazard and risk communication, monitoring and early warning) in the pilot area used for the student community service.
- c. Providing and improving the training modules, documentary film, pamphlet (poster/ calendar/ leaflet) for supporting the public education in multi-modal sediment disaster and earthquake

awareness.

- d. Continuously support the National Agency for Disaster Management (BNPB) to implement the disaster risk reduction program, by initiating developing a national action plan for landslide disaster risk reduction.
- e. Strengthen the cooperation with the oil and gas company (PT. Pertamina Geothermal Energy) and PT. Medco Energy to participate in the research-based education program for sediment-related disaster assessment and mitigation.
- f. Implement the national standard SNI-8235-2017 and international standard ISO 22327:2018 for landslide early warning system.

3) Beneficiaries of Project for Science, Education and/or Society (15 lines maximum)

- a. Local communities and local government in landslide and earthquake prone area, such as in Central Java; West Java; and East Java Province.
- b. Ministry of National Education especially in supporting the curricula development for Disaster Risk Reduction Education with respect to Education for Sustainable Development Program.
- c. National Agency for Disaster Management for developing a national masterplan and an international standard (ISO) for landslide disaster risk reduction ISO22327:2018 and a national standard for landslide early warning system SNI-8235-3017.
- d. Researchers and students involved in the study, by providing them the opportunity for having experience and knowledge enhancement through this study.

4) Results: (15 line maximum, e.g. publications)

1. 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.
2. 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.
3. Fathani T.F., Karnawati D., 2018. A landslide monitoring and early warning system. *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools*, Springer: 297 – 308.
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., 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.
6. 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.
7. Karnawati D., Fathani, TF., Wilopo W. (2014) The Development of National Master Plan for Landslide Mitigation in Indonesia, the 5th International Workshop on Multi-modal Sediment Disaster, Tainan, Taiwan, October 2014.
8. 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
9. Karnawati D., Ma'arif S., Fathani TF., Wilopo W. (2013) 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.
10. Karnawati D., Wilopo W., Setianto A., Suharman and Fathani TF. (2013) 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. Eds : Claudio Margottini • Paolo Canuti • Kyoji Sassa.
11. WCoE of Landslide Risk Reduction of UGM (2013) National Master Plan for Landslide Mitigation in Indonesia, Eds. Fathani TF, Wilopo W. and Karnawati D. *National Agency for Disaster Management of Indonesia*, December 2013.
12. Karnawati D, Frost EG, Fathani TF and Subroto (2012) Smart Grid for Landslide Monitoring and Early Warning System in Indonesia. *Proceedings of the 10th Anniversary of ICL – January 2012*, Kyoto. pp. 72-77.
13. Karnawati D, Fathani TF, Wilopo W, Setianto A, Andayani B (2011) Promoting the hybrid socio-technical approach for effective disaster risk reduction in developing countries. *Disaster Management and Human Health Risk II*, eds. Brebbia CA, Kassab AJ, Divo EA. WIT Press., Southampton, UK. pp. 175-182.
14. Karnawati, D., W. Wilopo, T. Fathani and B. Andayani (2011) Promoting the University Social Responsibility in the Capacity Development Program for Landslide Risk Reduction in Indonesia. *American Geophysical Union Fall Meeting*, San Francisco, California, December 5-8, 2011.
15. Karnawati, D., Fathani, TF., Sudarno, I., Andayani, B., Legono, D., Burton PW. (2011) Landslide Hazard and Community-based Risk Reduction Effort in Karanganyar and the Surrounding Area, Central Java, Indonesia, *Journal of Mountain Science*, Vol.8 No.2, 2011.
16. Karnawati, D., W. Wilopo, A. Setiawan, T.F. Fathani and Suharman (2011) Student Community Service Program for Landslide Disaster Risk Reduction in Indonesia. *Proceeding of the 2nd World Landslide Forum*. Roma, Italy, October 3-8, 2011.
17. Karnawati, D., W. Wilopo, I.G.B. Inderawan, and D. H. Barianto (2010) Promoting a Model of Research-Based Education in Disaster Mitigation, *Proceeding on the International Symposium on*

Disaster Mitigation (the 2nd Regional Conference of Disaster Mitigation – AUN/SEED Net). Eds: D.P.E. Putra and W. Wilopo. Bali, February 25 – 26, 2010.

18. Karnawati, D., Wilopo, W., Fathani, T.F., Andayani, B and Suharto (2010) Promoting Research-based Education Model for Developing Resilient Society Adaptable to Extreme Weather Conditions. *Proceeding (Extended Abstracts) of Global Center of Excellence – ARS Workshop*, January 12 – 14, 2010. DPRI – Kyoto University, Japan.
19. Verrier, M.F. D. Karnawati, E.G. Frost and D. L. Kimbrough (2011) Development of Scientific Procedure for Community-based Hazard Mapping and Risk Mitigation. *Poster presented in American Geophysical Union Fall Meeting*, San Francisco, California, December 5-8, 2011.

Related papers;

1. Development of Community Landslide Hazard Map for Landslide Risk Reduction, Proceeding of 11th Int. Assoc. of Engineering Geologist Congress, Auckland, September 5-10, 2010. Auckland, New Zealand.
2. Karnawati, D. , T.F. Fathani, Budi Andayani, P.W. Burton and I. Sudarno, “Strategic program for landslide disaster risk reduction; a lesson learned from Central Java, Indonesia” published in the Proceeding of International Conference on Disaster Management, 23 – 25 September, 2009, Wessex Institute, New Forest, Southampton, UK.
3. Karnawati, D., T.F. Fathani, Budi Andayani and P.W. Burton in “Landslide Hazard and Community-based Risk Reduction Efforts in Karanganyar and the Surrounding Area, Central Java, Indonesia”, published in the Proceeding of the 7th Regional Conference of IAEG (Int. Assoc. Of Engineering Geology), 9-11 September 2009, Chengdu, China.

Some additional results :

1. IPL Award for Success 2011 for IPL Project certified by the Global Promotion Committee of the International Program on Landslides.
2. Establishment of IPL World Center of Excellence in Landslide Disaster Reduction (2011-2014), (2014-2017) and (2017-2020)
3. Development of a national masterplan for landslide disaster risk reduction in cooperation with National Agency for Disaster Management (BNPB)
4. Development of a national standard and international for landslide early warning system in cooperation with National Agency for Disaster Management (BNPB) and other related ministries.
5. Modul for landslide disaster risk reduction to support public education at the village level.
6. Educational material for landslide awareness and calendar for landslide monitoring.
7. Installation of early warning equipment and the establishment of Local Task Force for landslide disaster risk reduction

8. Strengthened Network of Universities-Central Government-Local Government-Community for landslide disaster risk reduction program: <https://stirrrd.org/>
9. Enhancement of learning program and syllabi in Environmental Geology, at Geological Engineering Department, Gadjah Mada University
10. Establishment of Landslide School Network under IPL
11. Academic collaboration with Cement Company (Holcim), Oil-Gas Company (PT. Pertamina), Medco Energy, as well as with the Visualization Center, San Diego State University, California and the Pacific Disaster Center – University of Hawaii, USA.