Application Form for World Centre of Excellence on Landslide Risk Reduction 2020-2023

1. Name of Organization : Universitas Gadjah Mada
2. Name of Leader : Prof. Teuku Faisal Fathani

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   Core members of the activities:
   a. Dr. Wahyu Wilopo – Vice Director of Center for Disaster Mitigation and Technological Innovation (GAMA-InaTEK). Geological Engineering Dept. Universitas Gadjah Mada.
   b. Dr. Agung Setianto - Center for Disaster Mitigation and Technological Innovation (GAMA-InaTEK). Geological Engineering Dept. Universitas Gadjah Mada.
   c. Dr. Fikri Faris - Center for Disaster Mitigation and Technological Innovation (GAMA-InaTEK). Civil and Environmental Engineering Dept. Universitas Gadjah Mada.
   d. Dr. Hendy Setiawan - Center for Disaster Mitigation and Technological Innovation (GAMA-InaTEK). Geological Engineering Dept. Universitas Gadjah Mada.

3. Date of Submission of Application : 15 August 2019
4. Activity scale and targeted region.
   1) Global, 4) Regional, 5) National
5. Short Title : Development of risk reduction strategy and technological innovation for landslide mitigation
6. Objectives for the initial 3 years:
   a. Community-based disaster risk reduction in landslide vulnerable area, by integrating technical and social networks of landslide early warning system.
   b. Implementation of the technological innovation for landslide disaster risk reduction.
   c. Promoting a global standard of guidelines for the implementation of community-based landslide early warning system

7. Background Justification: (10 lines maximum)

Many efforts have been conducted for landslide disaster risk reduction in developing countries, however substantial socio-economical losses as the impacts of landslide disasters remains occur and significantly increases. It is also apparent that landslide preparedness and mitigation strategy have not yet effectively implemented. Poor community awareness, preparedness and participation and also poor coordination among stakeholders have been the major reason for such in effective landslide disaster risk reduction. Moreover, most of the technology applied for landslide mitigation and early warning is also not easy to be operated and maintained by the local authority/community. Therefore, the need to develop risk reduction strategy and technological innovation for landslide mitigation is urgently required.

8. Resources available for WCoE activities

Personnel, Facilities, Budgets, and Affiliation and Contribution to ICL/IPL-GPC.

a. Researchers with multidiscipline background, such as engineering geologist, civil engineers, electrical-mechanical engineering, social scientist and psychologists
b. Research facilities in Universitas Gadjah Mada (the Laboratory of Environmental Geology, Soil Mechanics Laboratory, Computing Laboratory, Field station and Field laboratory for landslide early warning system, Field laboratory of laharic flow and flood early warning system)
c. Budgets is available annually with the amount of USD 100,000 to USD 200,000.
d. Contribution to ICL/IPL-GPC: actively participate as the members of ICL/IPL in any scientific meeting and also assist the President and Executive Director of ICL/IPL.
e. Others :
    i. Having strong linkage with the Indonesian Disaster Management Authority and Indonesian Meteorological, Climatological, Geophysical Agency (BMKG), as well as the Indonesian central and local government of various provinces and regencies which are vulnerable for landslides.
    ii. Regularly provide scientific inputs to Indonesian Parliament at the National and Provincial Levels.
    iii. Adviser to the Indonesian President for landslide and debris flood mitigation and preparedness.
    iv. As the Host Institution for ASEAN University Network/South East Asian Engineering Education Development Network in the Field of Geological Engineering and Disaster Mitigation, which provide post graduate training for Master and Doctoral students in Geological Engineering and Disaster Mitigation.
    v. Having international collaboration with Kyoto University - Japan (DPRI and UNITWIN); San Diego State University (Faculty of Geology and Visualization Center); University of Hawaii – USA; California Geological Survey and California Safety Seismic Commission – USA; US Aid

for conducting capacity development on disaster management; R3ADY Asia-Pacific) with the members from US Pacific Commander, US Chambers of Commers, Rockefeller, US Aid, Caterpillar Foundation); GNS Science – New Zealand, MFAT- NZ Aid, Indonesian Affiliation Facility, Japan International Cooperation Agency (JICA), the British Council, Network of Humanitarian Action (NOHA) and also supported by Multi National Oil Company (Chevron, Newmont, PERTAMINA), National Oil and Geothermal Company (PERTAMINA), National Mining and Cement Company (PT Freeport, PT Medco, PT Arutmin, PT INCO, PT Holchim), and other National Company such as Indonesian Power.

9. Description of past activities related to risk reduction of landslides and other related earth system disasters (30 lines maximum)
   a. Geological and geotechnical investigations combined with technicall-social survey and analyses had been carried out to decide the most appropriate types and mechanism of early warning system as well as the strategy for landslide mitigation in 32 provinces in Indonesia and Myanmar within period of 2007 – now. All of those simple and high-tech technical system were integrated into a social system This social system was also connected to the local Institutions for Disaster Management at the district, regency, and provincial levels.
   b. Student Community Services for Disaster Mitigation, conducted every summer time at all over Indonesia, involving the undergraduate students from multi-faculties.
   c. Supporting the central and local government for establishing Task Force and contingency plan for regular program on landslide disaster risk reduction.
   d. Providing training modules, documentary film, pamphlet (poster, calendar, leaflet) for supporting the public education in landslide and earthquake awareness.
   e. Collaborative research on landslide mitigation also has been conducted with International Consortium on Landslides, Kyoto University, Tokyo University of Agriculture and Technology, GNS Science New Zealand, Shimane University, Tsukuba University, Mie University etc. (2004 – now).
   f. Joint supervision with Japanese University (Kyoto University, Hokkaido University etc.) for master and doctoral students research works (which is integrated to the collaborative research) in disaster mitigation of ASEAN region.
   g. Promoting Landslide Early Warning System as an international standard **ISO 22327:2018** Guideline for the implementation of community-based Landslide EWS: https://www.iso.org/standard/50064.html. At present, Universitas Gadjah Mada in cooperation with the Indonesian Disaster Management Authority is promoting **ISO 22328-1:2019**: Guideline for the implementation of multi-disaster EWS.

10. Planned future activities /Expected Results: (20 lines maximum; work phases and milestones)
    a. Maintaining and enhancing of the existing socio-technical system to support the landslide disaster risk reduction strategy.
    b. Extending and strengthening the linkage with industry and private sector for landslide disaster risk reduction.
    c. As the extension of landslide early warning system, developing a community-based debris flood (laharic flows) early warning system at volcanic rivers and flood early warning system at prone areas in Indonesia.
    d. Enhancing the existing program of student community service for disaster mitigation in every summer time.
    e. Supporting the Indonesian Disaster Management Authority for Developing the National Master Plan for Landslide Disaster Risk Reduction 2019-2023.
    f. Supporting the central and local government of disaster management authority for establishing Task Force and action plan for regular program on landslide disaster risk reduction.
    g. Providing training modules, documentary film, pamphlet (poster, calendar, leaflet) for supporting the public education in landslide and earthquake awareness and preparedness.
    h. Joint supervision for master and doctoral students research works (which is integrated to the collaborative research) in disaster mitigation of ASEAN region
    i. Collaborative research on Development of Crowd Sourcing as the Integration of Instrumental and Human Sensors for Landslide Early Warning System, partnership with Asia Pacific Disaster Risk Reduction and Resiliency and University of Hawaii.
    j. Collaborative research on disaster mitigation with DPRI Kyoto University.
    k. Promoting the importance of ethical concern in landslide research for disaster risk reduction.
    l. Guiding the standardization of landslide early warning system implementation based on the international standard **ISO 22327:2018** Guideline for the implementation of community-based Landslide EWS. Whereas for other disasters should comply with **ISO 22328-1:2019**: Guideline for the implementation of multi-disaster EWS.

11. Beneficiaries of WCoE: (5 lines maximum; who directly benefits from the work?)
    a. National Disaster Management Authority
    b. Local Agency for Disaster Management
    c. Indonesian Ministry of Research, Technology and Higher Education
    d. National and Local Development Planning Agency
    e. ASEAN researchers and students involved in the study, by providing them the opportunity for having experience and knowledge enhancement through this study, under the ASEAN University Network.

12. References: 10 lines maximum, i.e. relevant publications, international/regional/national recognition supporting items 9-10.

a. Setiawan H., Wilopo W., Wiyoso T., Fathani T.F., Karnawati D., 2019. Investigation and numerical simulation of the 22 February 2018 landslide-triggered long-traveling debris flow at Pasir Panjang Village, Brebes Regency of Central Java, Indonesia. ***Journal Landslides*** (2019) p 1-14. https://doi.org/10.1007/s10346-019-01245-0

b. ISO 22327:2018 Guideline for the implementation of community based landslide early warning system. https://www.iso.org/standard/50064.html

c. Fathani T.F., Karnawati D., 2018. A landslide monitoring and early warning system. K. Sassa et al. (eds.), *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools,* Springer: 297 – 308.

d. Karnawati D., Fathani T.F., 2018. A socio-technical approach for landslide mitigation and risk reduction. K. Sassa et al. (eds.), *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools,* Springer: 621 – 630.

e. Karnawati D., Fathani T.F., Wilopo W., Andayani B., 2018. Community hazard maps for landslide risk reduction. K. Sassa et al. (eds.), *Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools,* Springer: 599 – 606.

f. Fathani T.F., Karnawati D., Wilopo W., 2017. Promoting a global standard for community-based landslide Early Warning System. K. Sassa et al. (eds.), *Advancing Culture of Living with Landslides*, Springer, Vol. 1: 355 – 361.

g. Fathani T.F., Legono D., Alfath M.A., 2017. Sensitivity analysis of depth-integrated numerical models for estimating landslide movement. *Journal of Disaster Research*, Vol. 12(3): 607- 616.

h. 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.*

i. 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.

j. Karnawati D., Fathani, TF., Wilopo W. (2014) The Development of National Master Plan for Landslide Mitigation in Indonesia, the 5th Int'l Workshop on Multi-modal Sediment Disaster, Tainan, Taiwan, October 2014.

k. 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

l. 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.

m. Fathani T.F., Karnawati D., 2013. Progress on the Development of Real-time Monitoring and Early

Warning of Landslide. *Proceeding of IPL Symposium*, Kyoto, November 2013.

n. Faris F., Fathani T.F., 2013. A coupled hydrology/slope kinematics model for developing early warning criteria in the Kalitlaga Landslide, Banjarnegara, Indonesia. *Progress of Geo-Disaster Mitigation Technology in Asia, Environmental Science and Engineering,* Springer, Part II: 453- 467.

13. If your organization is an ongoing WCoE 2014-2017, please attach the articles reporting activities of WCoE, IPL project and ICL network published/contributed to either in *Landslides:* Journal of International Consortium on Landslides or/and the Fourth World Landslide Forum 2017.
    a. Setiawan H., Wilopo W., Wiyoso T., Fathani T.F., Karnawati D., 2019. Investigation and numerical simulation of the 22 February 2018 landslide-triggered long-traveling debris flow at Pasir Panjang Village, Brebes Regency of Central Java, Indonesia. ***Journal Landslides*** (2019) p 1-14. https://doi.org/10.1007/s10346-019-01245-0
    b. Fathani T.F., Karnawati D., Wilopo W., 2017. Promoting a global standard for community-based landslide Early Warning System. K. Sassa et al. (eds.), Advancing Culture of Living with Landslides. ***WLF-4 2017***. Springer, p. 355 – 361. DOI 10.1007/978-3-319-59469-9_30
    c. Abolmasov B., Fathani T.F., Liu K.F., Sassa K., 2017. Progress of the World Report on Landslides. K. Sassa et al. (eds.), Advancing Culture of Living with Landslides. ***WLF-4 2017***. Springer, p. 219 – 226. DOI 10.1007/978-3-319-59469-9_18

14. List of published or planned reports of WCOE 2017-2020 in journal "Landslides" or "WLF5 books" for ongoing WCOE organization.
    a. Setiawan H., Wilopo W., Wiyoso T., Fathani T.F., Karnawati D., 2019. Investigation and numerical simulation of the 22 February 2018 landslide-triggered long-traveling debris flow at Pasir Panjang Village, Brebes Regency of Central Java, Indonesia. ***Journal Landslides*** (2019) p 1-14. https://doi.org/10.1007/s10346-019-01245-0
    b. Fathani T.F., Wilopo W., Setianto A., Faris F., Setiawan H., 2019. Landslide and debris flow mechanism at Sentani Papua, Indonesia. Recent landslide at ***Journal Landslides***. (to be published)
    c. Fathani T.F., Wilopo W., Setianto A., Faris F., Setiawan H., 2020. The implementation of ISO 22327:2018 on Landslide Early Warning System at Developing Countries. ***WLF-5 2020.*** (to be published)

Note: Please fill and submit this form by 15 August 2019 to ICL secretariat <secretariat@iclhq.org>