INITIATING THE DEVELOPMENT OF THE LAHENDONG GEOTHERMAL EDUCATION PARK, NORTH SULAWESI, THROUGH STUDENT COMMUNITY EMPOWERMENT PROGRAM

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ABSTRACT

Lahendong geothermal field that is located in the beautiful volcanic landscape of Tomohon (30 km South of Manado) is the first geothermal field developed in the eastern part of Indonesia. Up to 2015 the field has met about 37% of the electricity demand of the North Sulawesi Province.

One of the key factors for the sustainability of geothermal business in the Province (and Indonesia in general) is the support from the community. The development of the Lahendong Geothermal Education Park (LGEP) that has been planned since 2011 aims to provide a geothermal public education facility in North Sulawesi that can increase the community awareness of the benefits of the development of this renewable energy resource.

Gadjah Mada University (UGM) works together with the geothermal stakeholders in the Province to initiate the development of the park. This was done through Student Community Empowerment (SCE) Program 2015. This paper presents the development process, the initial results, and the future work plans.

1. INTRODUCTION

Geothermal resources are important in tourism (e.g., Effurt-Copper, 2010). When combined with the educative activity, the geothermal tourism can be an excellent media for campaigning the geothermal resource development. Camu (2015) mentioned that social acceptance and the community involvement in the geothermal projects should be continuously maintain. These can be done through public education.

The idea of developing the Lahendong Geothermal Education Park (LGEP) as a public learning facility was published by Utami et al (2011). The idea was then adopted by the Government of North Sulawesi for planning the development of regional geo-park and geo-tourism in the Province. Through several focus group discussions held by the Government involving the representatives of geothermal stakeholders (Central and local and Government bodies, steam field operator, electricity company, tourism operators, Indonesian Geothermal Association, academicians, and local communities) it was identified that there are two major constraints hampering the development of the park, namely, 1) lack of coordination among the stakeholders, and 2) lack of capacity, leadership and involvement of the Government.

One of the missions of UGM is community empowerment. Among university's many programs of community empowerment is the Student Community Empowerment (SCE) Program that facilitates learning activity to the students to respond to the needs of the community. Every year the UGM dispatches groups of students from different faculties to the fields for two months to identify the needs of community and seek for solutions based on their background knowledge.

Responding to the slow progress of the development of LGEP UGM proposed to the Government of North Sulawesi Province to kick-start the process through Student Community Empowerment Program. The proposal was accepted and supported by all other geothermal stakeholders. Starting from 2015 UGM dispatches group of 20 undergraduate students and a supervisor to Tomohon, to engage with the geothermal stakeholders there to bring the plan of the development of LGEP into reality. The success of this initial effort was marked with a geothermal festival in August 2015. For the sustainability of the program UGM schedules the student dispatch every year during the inter-semester break.

2. SUPPORTS FROM STAKEHOLDERS

The initiation of the development of the LGEP was made possible by the supports from stakeholders. The Ministry of Research and Higher Education provides funding for transportation and living cost for the students and the supervisor. Ministry of Energy and Mineral Resources (MEMR) and Sam Ratulangi University (UNSRAT) provided resource persons to join the UGM geothermal team in preparing the local capacity. Local Government helped the organization of the workshops for local capacity building, the engagement with the local communities, and provided facilities for the geothermal festival.

New Zealand Government as a partner of Indonesia in advancing geothermal development provides financial support through the NZAID-UGM CaRED funding scheme. Part of the funding is allocated for capacity building and community empowerment in the Eastern Indonesia, including to support the initiation of the development of LGEP (Petrus et al, 2015).

The steam field operator (PT. Pertamina Geothermal Energy/PGE) and the geothermal power producer (PT. PLN Persero) provided technical consultancy in designing the concept of the geothermal educative tourism and sponsored the making of the basic elements of the park. Tourism operators (D'Linow Café and Pinus Lahendong Resort) provided access to their precincts and installed safety trails in their surrounding thermal manifestations. The Masarang Foundation provided access to its geothermal direct use palm sugar factory for the geothermal educative tourism.

3. BUILDING THE LOCAL AWARENESS AND CAPACITY

To build the awareness of the local communities on the plan of the development of the LGEP and to prepare the capacity of the Local Government, UGM has conducted the following workshops prior to the dispatch of the student team to the field.

a) Workshop for the Local Government Staff (February 2015) to develop concept of geothermal educative tourism and to enhance the strategy of the development of the required infrastructures.
b) Workshop for high school teachers in Tomohon City and Minahasa Regency (March, 2015) aimed to provide the teachers with adequate geothermal knowledge and to survey their expectations about the public geothermal education facility.
c) Workshop for community leaders in Tomohon City and Minahasa Regency (July, 2015). It aimed to improve their understanding about geothermal resource development process, to disseminate the information about the plan of developing LGEP, as well as to consult about the community involvement in the development, maintenance and the utilization of the park.

4. FIELD ACTIVITIES AND TANGIBLE PRODUCTS

Mentored and supervised by the author the students designed and executed the field activities. Given the short duration of the program and the limited funding the following activities were selected to kick-start the development of the LGEP.

The activities in the 2015/2016 Academic Year included mapping of the socio-economic baseline conditions, modeling of the geothermal educative tourism, surveying and planning the park site, as well as construction and installment of the basic park elements. The tangible products from these activities are as follows.

4.1 Guide book of Lahendong geothermal educative tourism

The first edition of a guidebook on Lahendong geothermal educative tourism has been produced by Utami et al (2014). During the SCE Program in 2015 the book was updated with tourism trail map. Hard copies of the guidebook will be lodged at the Tomohon City Tourism Office, and will be made available for the public. The electronic files of the book and map will also be made available from the websites of UGM and the Tomohon City Tourism Office.

4.2 Geothermal information billboards and safety trails

The basic elements of the park to be installed at Lahendong are geothermal information billboards, safety trails, lookouts, shelters, visitor information centre, muster points, and public facilities (Utami, 2011). The easiest elements to be developed in short period of SCE program are the geothermal information billboards and safety trails in the thermal manifestation areas.

Nineteen billboards (examples of the content and design on Figure 1) were produced and installed in the field to provide visitors with comprehensive explanations about: a) geothermal system in Lahendong, b) advantages of geothermal energy, c) thermal manifestations and their dynamic nature, d) production process and equipments, e) electricity generation, f) biodiversity in Lahendong geothermal field, and g) safety procedures in visiting thermal areas and geothermal fluid production facilities.

4.3 Geothermal information billboards and safety trails

The basic elements of the park to be installed at Lahendong are geothermal information billboards, trails, lookouts, shelters, visitor information centre, muster points, and public facilities (Utami, 2011). The most feasible elements to be developed in the short period of SCE Program are the geothermal information billboard (funding from PT. PGE and PT. PLN Persero) and safety trails in the thermal manifestation areas (in-kind sponsorship from a local tourism operator). Figure 2 shows the situation map of the Lahendong geothermal field and the location of the information billboards and safety tourism trails.

4.4 Miniature of the Lahendong geothermal field

A miniature of the Lahendong geothermal field has been made by UGM student team. It features the thermal manifestations, the fluid production field, the power plants, the electricity distribution facility, the hydrologically important sites, as well as the early form of the LGEP facilities. The miniature is now temporarily lodged at the lobby of the PT. PGE Lahendong Office. In the future it will be installed at the public facility such as the information centre.

4.5 New design of the Tomohon Geothermal and Geo-tourism Information Centre

A geothermal and geo-tourism information centre was built in 2009 by the Local Government in the south bank of the Lake Linow (location indicated in Figure 2) The building has not been used since then and is now collapsed (Figure 3A and B). A new design was made by the UGM student team (Figure 3C). It is suggested that re-building and operation of the information centre is included the new development plan by the Local Government.

4.6 Other products

Other products of the year-1 (2015) are the draft of the atlas of the biodiversity in Lahendong geothermal field, and the model of integrated geotourism in North Sulawesi.

5. SOFT LAUNCHING OF THE LGEP

The first Indonesian Geothermal Festival was staged in the western bank of the Linow Lake on 6 – 7 August 2015 to soft launch the LGEP (Figure 4). The two-day festival became a social-educational gathering of all geothermal stakeholders in North Sulawesi. The program in the festival included:

- Geothermal talk show that allowed a discussion among the geothermal stakeholders in North Sulawesi.
- Exhibition of geothermal research and development activities by MEMR, PT. PGE, PT. PLN, local enterprise of geothermal direct use, UGM, and UNSRAT.
- Cultural performances by local school students.
- Geothermal Fun Trip for local school students, teachers and parents guided by the UGM students. The stop sites included selected thermal manifestations, geothermal fluid production field, the electricity generation plant and the direct utilization plants. All the stop sites have been equipped with the relevant information billboards.

The soft launching of the LGEP was marked by the striking of "tetengkoran" (bamboo alarm instrument) by the Governor of North Sulawesi Province, Dr. Sinyo Harry Sarundajang and the Vice Rector of UGM for Research and Community Empowerment Affairs, Prof. Suratman Worosuprodjo. The result of the early development of the LGEP was then handed symbolically to the Mayor of Tomohon City, Mr. Jimmy F. Eman. A Memorandum of Understanding on the advancement of geothermal development in North Sulawesi involving UGM, Government of North Sulawesi Province, PT PGE, PT PLN, UNSRAT and University of Manado (UNIMA) was signed in this event, witnessed by the Ambassador of New Zealand for Indonesia, H.E. Dr. Trevor Matheson.

6. ESTABLISHMENT OF LOCAL GEOTHERMAL YOUTH COMMUNITY

The interaction between the UGM students and the local youth has resulted in the idea of establishing a geothermal youth community. This community was inaugurated on the 17 August 2015, at the commemoration of the 70th year of Indonesia's Independence Day. There are 10 local youth who become founding members. They consist of local university students, musicians, carpenters, and local private company staff. Their role is to convey positive messages to the larger circles of community in North Sulawesi to support geothermal resource development for electricity generation and the development of other geothermal-based economic livelihood. UGM supports their first year activity by upgrading their geothermal knowledge and improving their communication skill, as well as helping them formulating their future programs.

7. FUTURE WORK

UGM has committed to continue its community empowerment program in developing the LGEP. Jointly with the Local Government and related stakeholders UGM plans the following future work:

a) Monitor the impact of the existence of the LGEP to the social acceptance of the expansion of the Lahendong geothermal field.

b) Enhancement of the park concept and design by considering the need of academic community to have a research station at the Lahendong geothermal field.

c) Construct the road map of the development of the LGEP and geothermal educative tourism, and looking for creative scheme of funding.

d) Continue the effort of completing the construction of basic park elements and maintaining the support from the local community through SCE Program. UGM expects that this type of SCE can be joined by students of the local universities.

8. CLOSING REMARKS

The initiation of the development of LGEP through UGM Student Community Empowerment Program 2015 is a significant milestone that marks the collective endeavour in empowering the community through public education. Although the LGEP is still in its infancy, its existence is expected to speed up the execution of the larger scale development.

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REFERENCES

Camu, M.: Geothermal education: a campaign for sustainability. Proc. of the World Geothermal Congress 2015, Melbourne, Australia. 7 p (2015).

Efurt-Copper: The importance of natural geothermal resource in tourism. Proc. World Geothermal Congress 2010, Bali, Indonesia. 10 p (2010).

Petrus, H.T.B.M., Utami, P., Warmada, I.W., Jaelani, K.M., Kusmono, K., Perdana, I.: Geothermal Energy for Green, Sustainable Development and Community Prosperity in the Eastern Indonesia: NZAID-Gadjah Mada University-supported CaRED Program. Proc. of the World Geothermal Congress 2015, Melbourne, Australia. 9 p (2015).

Utami, P., Khasani, Roeroe, J., Tuerah, N., Bachrun, Z.I., Rozaq, K., and Gumalag, M.: Lahendong Geothermal Education Park: a proposed geothermal public education facility in the eastern part of Indonesia. Proc. of New Zealand Geothermal Workshop 2011, Auckland, New Zealand. 5 p. (2011).

Utami, P., Khasani., Warmada, I.W., and Cahyawijaya, S.Y.: Guidebook for geothermal tourism activity in Lahendong. Pustaka Geo, Yogyakarta. 36 p. (2014). In Bahasa Indonesia.

Figure 1. Examples of the content and design of the information billboards.

A. Basic Explanation about geothermal energy

B. Description and explanation about fumaroles and steaming ground.

C. Fluid production facilities.

D. Bidversity in the thermal areas around Lake Linow.

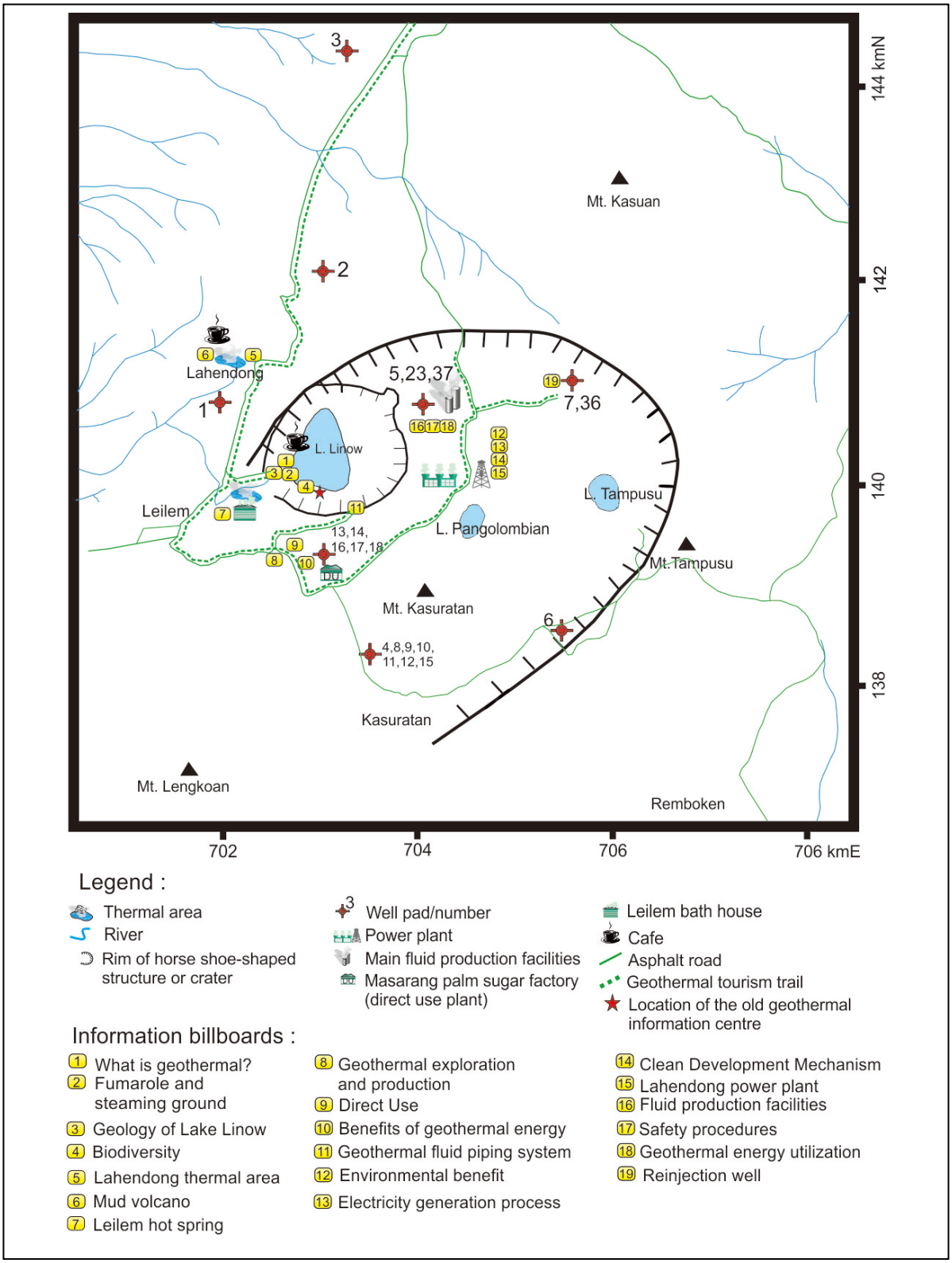

Figure 2. Situation map of the Lahendong geothermal field showing the interesting sites to visit.

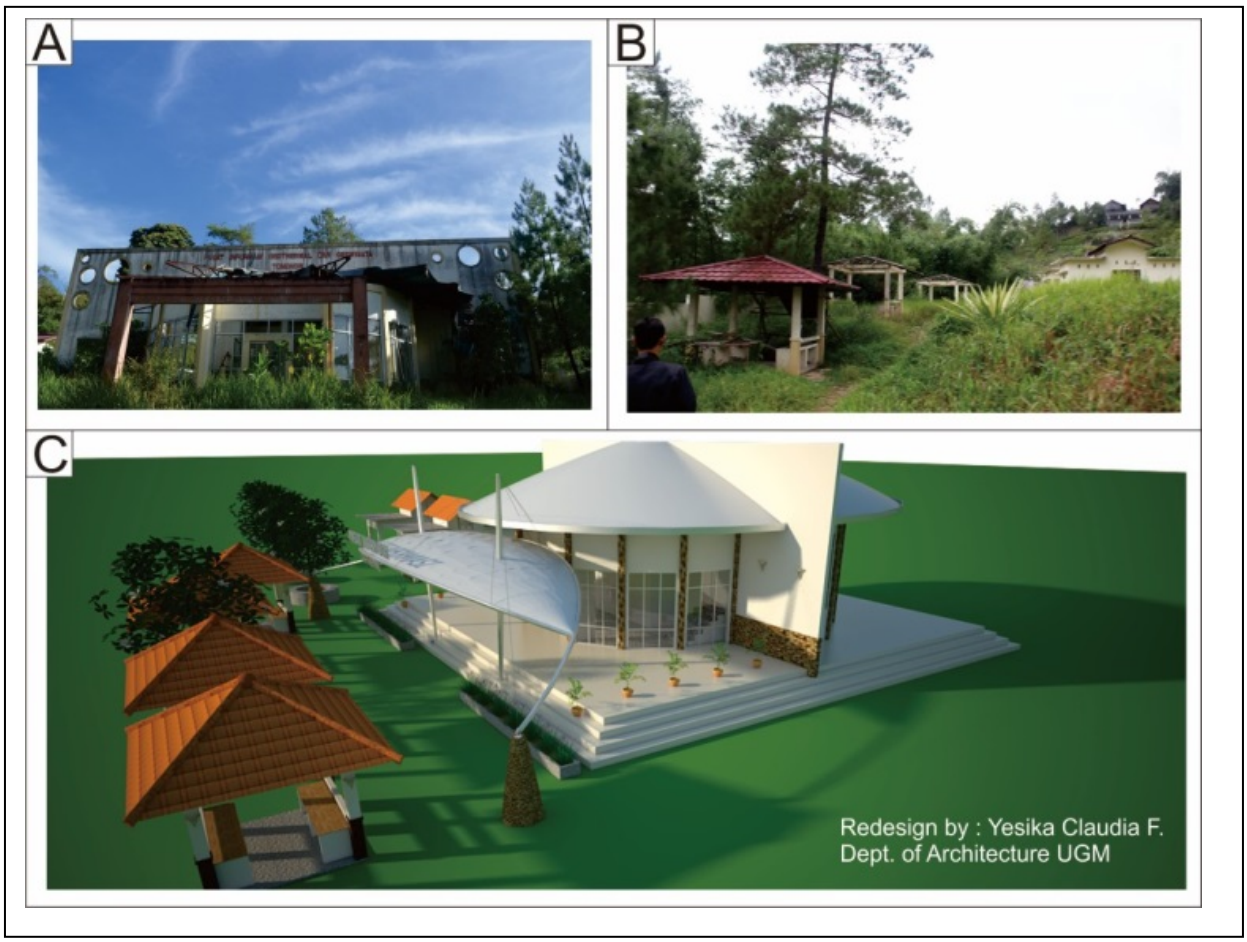

Figure 3. A & B. the existing condition of the building of the Tomohon Geothermal and Geotourism Information Centre. C. New design by one of the members of the SCE team 2015.

Figure 4. Some important activities during The First Indonesian Geothermal Festival 6 – 7 August 2015.
A. Geothermal talkshow.
B. Geothermal exhibition.
C. Soft launching of the LGEP.
D. Signing of MoU by UGM and other geothermal stakeholders.
E. Geothermal Fun Trip led by UGM students.