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# Human Resources in the Urban Environment of Citatah Mining Area, West Bandung Regency, Indonesia

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**Abstract.** Citatah area of West Bandung Regency has several locations of mining site in West Java Province. The mining sites consist of limestone, marble, andesite and sand quarries. The long period of mining industry had been started since colonial era. Despite the environmental damages due to mining operation, there are still many people living in this area. The objective of this paper is to examine the available human resources around the study area to support its mining industry. Methodology in this study consists of human resources mapping to analyse its support for sustainable urban environment. Results show that around several quarries in the study area people have no longer interests to support the mining industry. Some communities have more attention to build the more sustainable idea of geotourism by creating historical site of Guha Pawon Cave and the beautiful Stone Garden in the study area. It can be concluded that there is awareness of community for the conservation ideas to support the sustainable urban development rather than mining industry.

**Keywords:** Human resources, mining, urban development, environment, Citatah

## 1. Introduction

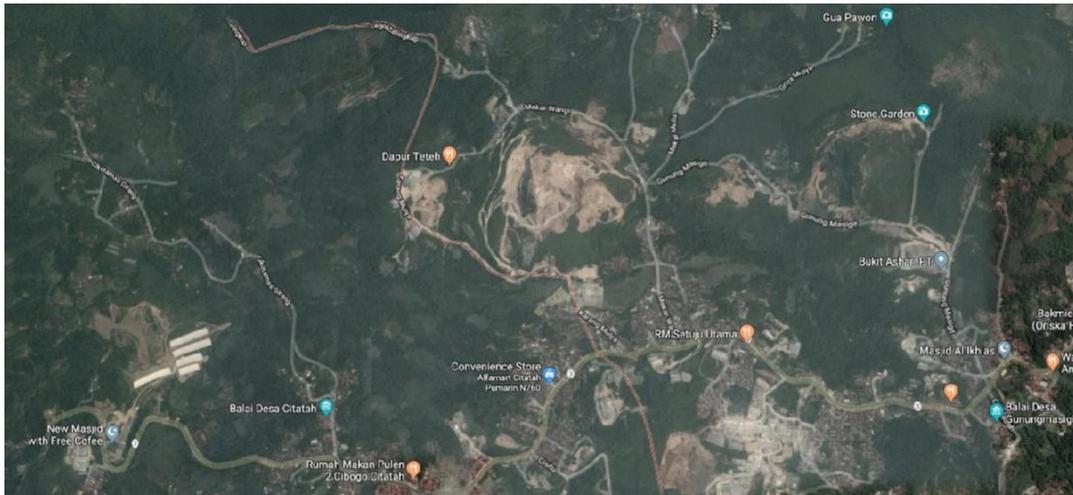
Citatah area of West Bandung Regency has several locations of mining site in West Java Province. The mining sites consist of limestone, marble, andesite and sand quarries. The long period of mining industry had been started since colonial era. According to the regional geology report by Sudjarmiko (1994) [1], the study area has abundant potential of limestone industry despite its location adjacent to the national road connecting 2 cities between Bandung City and Cianjur Regency (see Figure 1).

The study area is frequently visited by many scientists, lecturers and university students due to the occurrences of rock exposures for many kinds of research purposes. Easy accessibility from nearby national road and highway between Bandung and Jakarta has attracted also many tourists and visitors to this area.



Recently there are disputes about this geoheritage between the environmentalist and the industrialist. The environmentalist proposes efforts to protect the area from destruction due to mining activities, while the industrialist persists to extract the economic values of minerals through quarries.

These 2 different views have significantly distributed not only in the neighborhood of local people but also among visitors. In some cases, this dispute had become a sparkling fire for horizontal conflict among communities in the study area. Despite the environmental damages due to mining operation, there are still many people living in this area.



**Figure 1.** Location of the study area in West Bandung Regency adjacent to the national road connecting Bandung to Cianjur and Sukabumi Regencies (extracted from Google Map).

Based on the background above, the objective of this paper is to examine the available human resources around the study area in supporting the dispute between conservation of environment and the mining industry.

## 2. Method

Methodology in this study consists of human resources mapping to analyze its support for sustainable urban environment. Distribution of local inhabitants, buildings, houses and public facilities are the concern of mapping. Urban environment for developing sustainable smart city is also the main attention of this study.

The involvement of local people in mining industry around quarries and the role of visitors as well as environmental concern organization become the focus of the field study.

## 3. Result

According to Maulana (2011) [2] the occurrence of limestone sediment is categorized as karst area with unique appearances. The karst area is considered as protected environment area though delineation of this area is still debatable. Geomorphology of the study area mainly consists of hilly to mountainous terrain. This condition has created the site for rock climbing sport in several peaks such as Citatah 90, Citatah 49 and Citatah 125 steep slope hillside (see Figure 2).

Landslide hazard in this area is predominantly categorized as a compound landslide especially around Citatah Village especially during the rainy season (Mulyadi, 2018) [3].



**Figure 2.** Geomorphology of the study area showing steep slope on quarries and mixed distribution between industrial facility and local community housing

From the field visit, it is found that many local people of this area have started to concern of maintaining environment through local knowledge and wisdom. Kusumasari and Alam (2012) [4] discussed the term of local wisdom and defined as respect for local culture. This collective idea emerged as a sense of solidarity and tolerance which was embedded in the daily life of the local community. Local wisdom is recognized by the local community as an adopted value and practices. The local government set up programs and involved the community in the process to understand the strong local culture in their daily life. This concept gave the community the opportunity to decide on the type of activities suitable with local needs and daily life.

Some communities have attention to build the more sustainable idea of geotourism by creating historical site of Guha Pawon Cave and the beautiful Stone Garden in the study area. This idea is supported by the visitor or local tourist as a mean of empowerment for local people. Visitors are classified from professional scientists, academic researcher as well as environmental organizations. They support the local inhabitant to face the mining activities (see Figure 3). The support is aimed to gradually educate people, government and even business about the importance to protect the environment for its sustainability of this study area.

#### **4. Discussion**

Himawan *et al.* (2014) [5] mentioned that local wisdom can be utilized as the socio-ecological values among people living around the quarry, where local community knowledge systems can be basic principles in managing natural surroundings around the quarry. This knowledge is meant to develop basic strategy for the maintenance of livelihood towards achieving green era such as creating Smart City concept.



**Figure 3.** Field observation of some professional and scientist to discuss the environmental issues and effort for protection of the study area.

In the study area, the people have to start to look for other source of income based on the karst sediment condition. This effort is through the development of geotourism. This idea is based on sustainable concept to reduce the exploitation of natural resources. The local people in general support the rock climbing sport locations and create more interesting locations for tourism.

The establishments of the Stone Garden and Gua Pawon Cave are means of keeping environmental friendly and part of geohazard mitigation (see Figure 4).



**Figure 4.** Gua Pawon Cave as important archeological site (left) and Stone Garden as geotourism destination to support the efforts for environment protection in sustainable development.

Education stakeholder is considered as important actor in educating people for environmental protection. Therefore, it is necessary to include the education system in the study area as stakeholder to maintain the spirit of environmental concern for local community [6]. More over when disaster issue is added as part of education system, schools and local people can participate to educate the

community through the pupils in terms of environmental concern. Teachers and students are expected to become the agents for managing sustainable nature as well as to educate other stakeholders [7].

## 5. Conclusion

It can be concluded that there is awareness of community for the conservation ideas to support the sustainable urban development rather than mining industry. The disputes around limestone quarry between the exploitation of resources and conservation to maintain the safe and healthy environment. Local wisdom and knowledge are utilized to support the effort for disaster risk reduction or mitigation through development of geotourism. To maintain this sustainable effort, it is necessary to educate all stakeholders including local and provincial government; industry, etc. This report is intended to support preparing the community toward future hazard exposure as well as the intention to create Smart City in the future for the particular area.

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