PRELIMINARY SLOPE MAPPING IN CINTARATU VILLAGE, PANGANDARAN, WEST JAVA

Bambang Hermanto[1], Pringgo Kusuma Dwi Noor Yadi Putra[2], and Nur Khoirullah[3]

[1]Departement of Business Administration, Faculty of Social and Political Sciences, Universitas Padjadjaran

[2]Department of Fisheries, Faculty of Fisheries and Marine Sciences, Universitas Padjadjaran

[1,2]PSDKU Pangandaran, Universitas Padjadjaran

[3]Department of Applied Geology, Faculty of Geological Engineering, Universitas Padjadjaran

Corresponding author: b.hermanto@unpad.ac.id

ABSTRACT

The shape of a landscape is the result of geological processes in the past as well as human processes at this time. Slope mapping is one way of identifying hazards based on current landforms. Cintaratu Village area is an area that has a unique landscape condition because it has a lot of clastic limestone as a result of the karstification process millions of years ago and is currently experiencing significant developments in infrastructure development. This study aims to see the state of the slope around Cintaratu Village. This research uses a qualitative method that will be described as descriptively. Based on the results, several areas have very steep slopes form by clastic limestones and soils. The mean slope varies from 30° to 90° with a height of up to 30 m.

Keywords: geomorphology; landscape; slope

INTRODUCTION

Cintaratu is a village located in Parigi District, Pangandaran Regency, West Java. The area of Cintaratu Village has an area of approximately 1029 hectares. it is located between villages that still belong to the same sub-district. It is bordered by Selasari Village to the north, Cintakarya Village to the south, Bojong Village to the east, Selasari Village to the west.

Based on the results of regional geological mapping, the oldest rocks that make up the area of Cintaratu Village are the Pamutuan Formation, which is included in the Kalkarenite Member (Tmpl) consisting of calcarenite, clastic limestone and alternating with marl. Calcacrenite is light gray to dark gray; solid; fine-grained to gravel with calcite, aragonite and clay minerals, and volcanic rock chips; well layered with an average thickness of 10 cm (Simanjuntak and Surono, 1992). Until now, information such as the previous explanation is still very minimal. The natural potential in Cintaratu Village is still not well studied to be developed. Therefore, research is needed as an initial reviewer to be able to explore the potential of natural resources and is expected to become an important asset in future joint development activities with the community.

Research to obtain information regarding the mapping of natural resource potential in Cintaratu Village can be carried out with one of the research institutions established in the village, namely Padjadjaran University PSDKU Pangandaran. Mapping the potential of natural resources can be done as an initial basis for one of the programs launched by UNPAD, namely the empowerment of the surrounding community. This information can be done by doing geomorphological mapping to provide a visualization of the state of natural resources in it.

Geomorphological mapping provides an overview as well as examines information regarding the landscape of an area (Brahmantyo and Bandono, 2006). Research on Geomorphological Mapping is needed as a village database for regional development. Geomorphological maps have several elements in it, namely elements of Morphology, Morphometry, and Morphogenetics. Therefore, this research aims to identify the geomorphological slopes around Cintaratu Village. It is hoped that this mapping will become a guide for villages in formulating policy directions based on geomorphological aspects.

METHOD

This research was conducted using qualitative methods, the results of which were

E-ISSN : 2579 – 3136

analyzed descriptively to provide an overview of the physical characteristics of the land in Cintaratu Village, Parigi District, Pangandaran Regency. The data needed to identify slope conditions are data on slope height, slope, rock type, and slope hardness values. The research stage was carried out in 4 stages, namely the stages of preparation, data collection, data processing, and data analysis. The preparation stage is carried out by presenting a topographic map of the research area using remote sensing to be able to see the slope contours. The topographic map of this area will be a reference at the data collection and analysis stages.

Field data collection was carried out directly in several areas to carry out a validation survey of slope characteristics (ground check). Determining the location of the ground check using a purposive sampling method based on the topographic map of the area that has been presented at the research preparation stage. This is because slope data collection is carried out only in areas that have a disaster risk, such as slopes near human activities, for example, slopes close to road access and residents' houses. The number of slopes sampled is 30 slopes scattered in each hamlet. According to Sekaran (1984), at least 10 to 20 sample data are needed to conduct a simple study. The analysis used in this research is a descriptive analysis that aims to provide an overview and also an explanation of the geomorphological characteristics in Cintaratu Village.

RESULT AND DISCUSSION

a. Brontos Hamlet

The image shows the field location points that have been marked using Google Earth during the observation. It can be seen that only one slope is found in Bontos Hamlet. This means that the slopes in Bontos Hamlet are very rare because if we observe the hamlet it is a hamlet with a wide expanse of rice fields so that it is dominated by lowlands. The slope in the hamlet is about 29 meters high with a slope of up to 37°, according to Van Zuidan (1988), it can be categorized as a very steep slope. (Bandono, 2006).

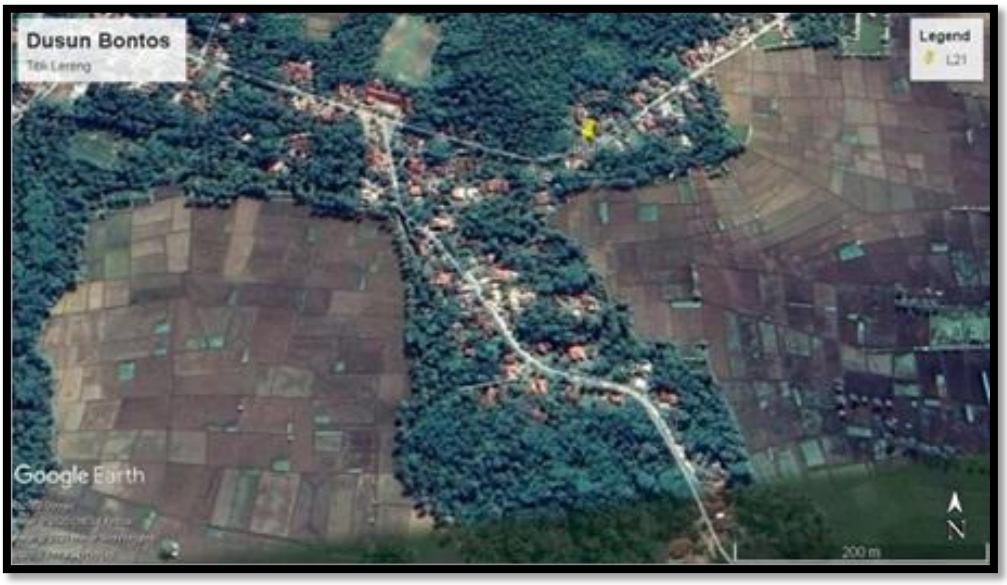

Figure 1 Slopes Observation at Bontos Hamlet

b. Cintasari Hamlet

There are four slope points and one cave point that have been observed and marked. According to field observations, the slopes in Cintasari Hamlet are categorized as steep slopes (Van Zuidan, 1988). The cave in the hamlet is a source of water. When the observation was made in the cave, inside there was water that flowed like a river. The cave also has the potential to be used as a tourist attraction because the cave has the potential to be traced by potential visitors. Pictures of sampling in Cintasari Hamlet are presented in Figure 2.

E-ISSN : 2579 – 3136

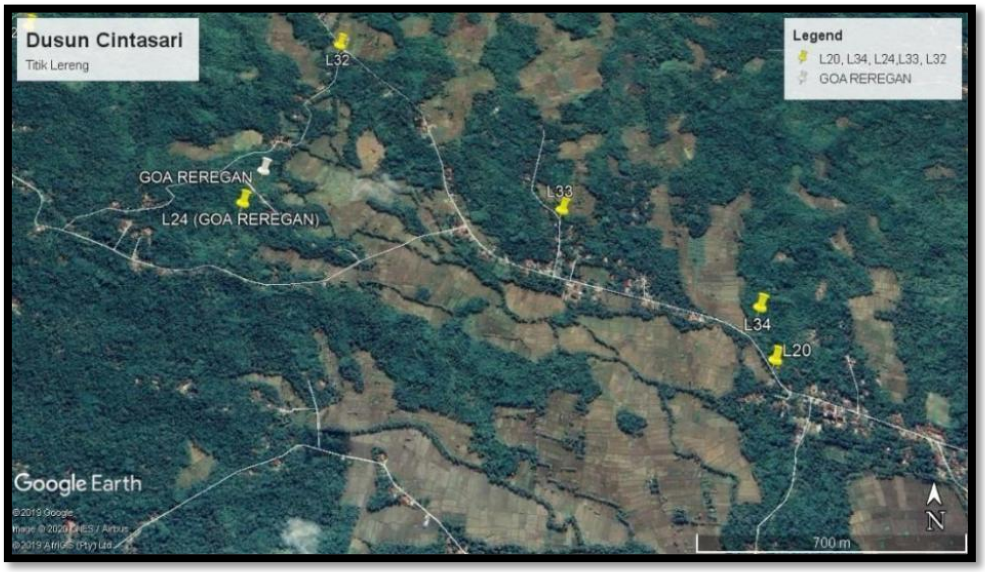

Figure 2 *Slopes Observation at* Cintasari Hamlet

c. Sukamanah Hamlet

The number of slopes found in this hamlet is far more than the previous hamlets. Slopes with a height of about 20-30 meters and a slope of more than 55° are classified as steep slopes. The slope is very potential for landslides when the constituent material is under the rock and above it, there is soil material or other material that has the potential to cause rock landslides or landslides. The position of data collection in Sukamanah Hamlet is presented in Figure 3.

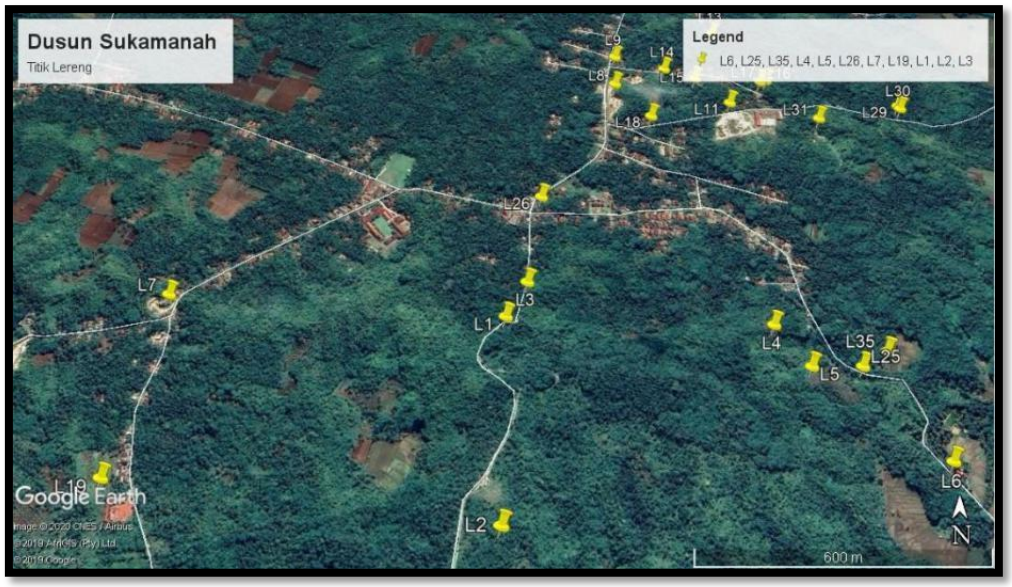

Figure 3 Slopes Observation at Sukamanah Hamlet

d. Gunungtiga Hamlet

Gunungtiga hamlet has quite a lot of slopes. Besides, Gunung Tiga Hamlet also has a spring, namely Jojogan which can be developed for tourism objects, although

E-ISSN : 2579 – 3136

currently Jojogan tourism is also being developed. From the figure above, there are four slope points with an average height of 10 meters with an average slope between 35-55, so it can be categorized as a very steep slope (Van Zuidam, 1988).

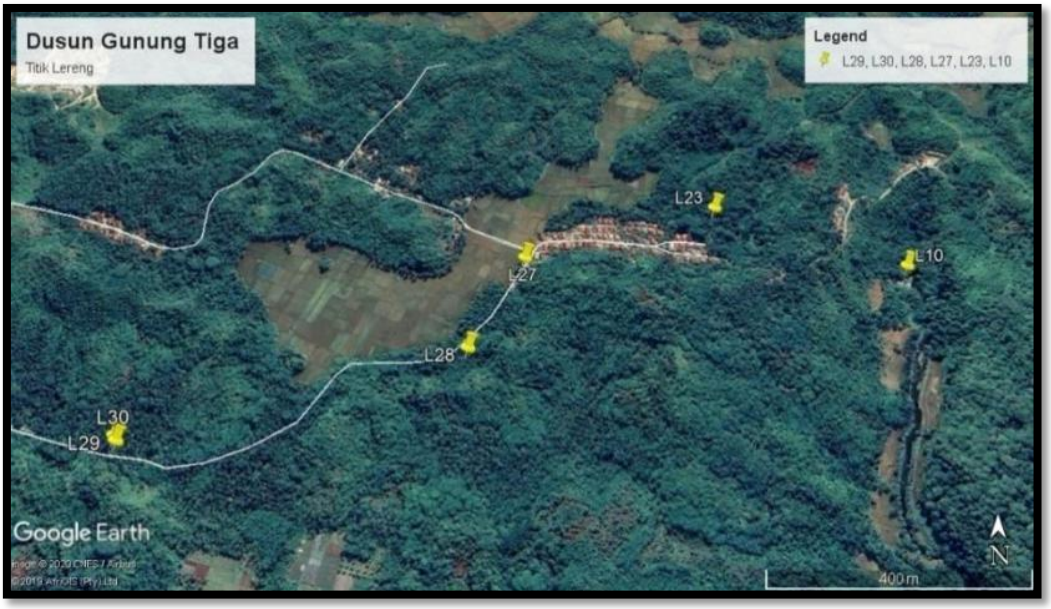

Figure 4 *Slopes Observation at* Gunungtiga Hamlet

E. Panglanjan Hamlet

Hamlet of Panglanjan Hamlet is a hamlet that has many slopes. The slopes in the hamlet can be categorized as steep slopes because the average slope is more than 55°. In this hamlet, there is a high slope pinning the road that could potentially landslides because above it is a thin layer of weathered soil. In this hamlet, there is a slope with a height of approximately 30 meters with a short distance from the residents' houses. The sampling position in Panglangjan Hamlet is presented in Figure 5.

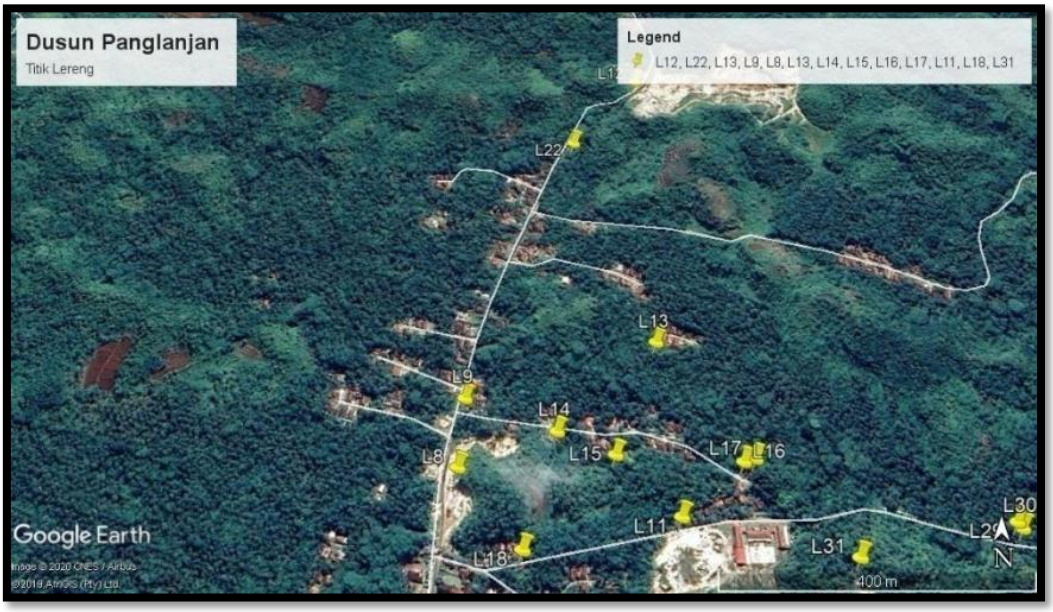

Figure 5 Slopes Observation at Panglanjang Hamlet

E-ISSN : 2579 – 3136

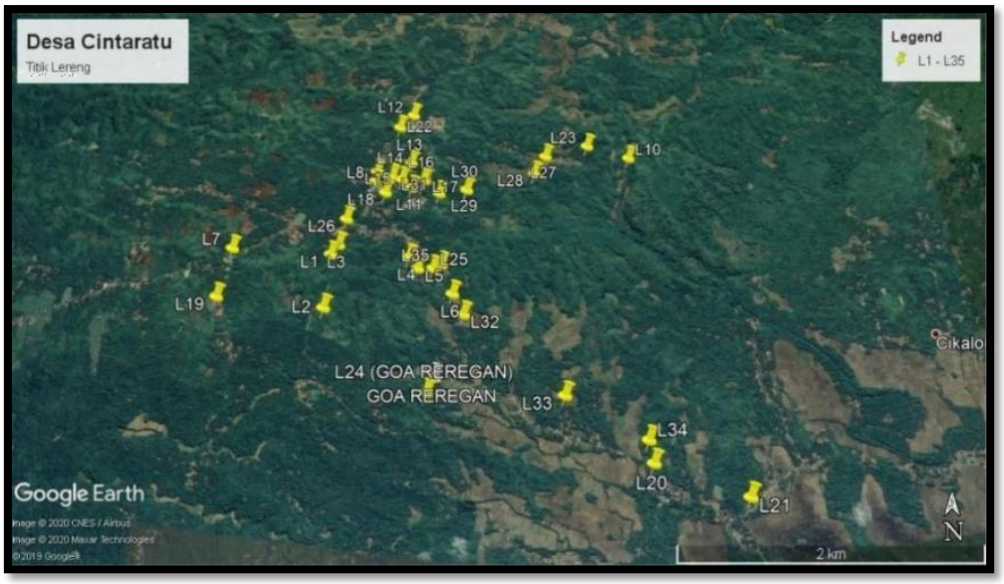

Figure 1 Slopes Observation at Cintaratu Village

From field observations, 35 slope points were found in Cintaratu Village. The slopes are mostly located in Sukamanah and Panglangjan hamlets. The slopes in Cintaratu Village have a height ranging from 0-30 meters, with slopes ranging from 30° to 90°. Therefore, the average slopes found in Cintaratu Village can be categorized as very steep and steep because they have a slope between 35° and more than 55° (Van Zaidan, 1988). The slopes observed on Cintaratu village are mixed natural and human process made or excavated. On figure 7, it can be seen how steep a human made. This slope is close to 90 degree.

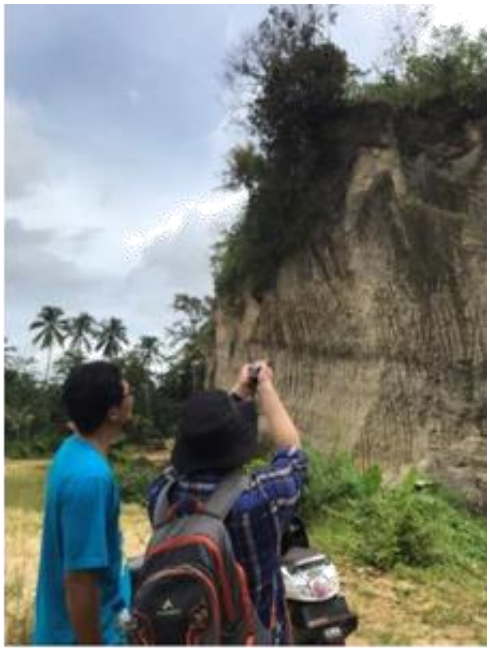

Figure 7. The Steep Slope Composed of clastic limestone mostly found on Cintaratu Village

CONCLUSION

The landform of Cintaratu Village recorded by us is in the form of slopes with a total of 35 pieces spread across five hamlets, namely Bontos Hamlet (1), Cintasari Hamlet (5), Sukamanah Hamlet (11), Panglanjan Hamlet (13 units), and Gunung Tiga Hamlet (5 units). Our data collection results show that the slopes altitudes ranging from 0- 30 meters, with slopes ranging from 30° to 90°. Therefore, the average slopes found in Cintaratu Village can be categorized as very steep and steep because they have a slope between 35° to more than 55°. Apart from landforms, we found several other potentials with which this data could be used for further research. The future potential analysis is to determine how critical the slopes to failure.

ACKNOWLEDEMENT

The authors would like thank to DRPMI Universitas Padjadjaran and PSDKU Students involving during sites observation, Imas Farida, Maula Asri Ramadhani, Teti Ruliati, Sang Ayu Made Sri Utami Dewi, Ai Wia, and Muhammad Fikri Abdulatif.

REFERENCES

Bermana, Ike. 2006. Geomorphological Classification For Geological Mapping That Has Been Standardized. *Bulletin of Scientific Contribution : Geology*. 4(2):161-173.

Brahmantyo, B., Bandono. 2006. Classification of the shape of the earth (landform) for geomorphological mapping at a

E-ISSN : 2579 – 3136

scale of 1: 25,000 and its application for spatial planning. *Jurnal Geoaplika*. 1(2):71-78.

Howard, A. D. 1967. Drainage Analysis in Geologic Interpretation: A Summation. *AAPG Bulletin*. 51(11):2246-2259.

Simandjuntak, T.O., Surono. 1992. *Regional Geological Map of Pangandaran, Java*. Pusat Penelitian dan Pengembangan Geologi: Bandung

Van Zuidam, R. A. 1983. *Aerial Photo – Interpretation in Terrain Analysis and Geomorphologic Mapping*. Smith Publisher: The Hague: ITC.

E-ISSN : 2579 – 3136