

MORPHOLOGICAL CHANGES IN WESAKIN VILLAGE ALONG THE EDGE OF "UWE" RIVER JAYAWIJAYA REGENCY PAPUA MOUNTAINS PROVINCE INDONESIA

Aprianto Soni^{1)*}, Hardiyanti YM²⁾, dan Andi Astri Faradiba³⁾,
Bella Syafira Rahmatullah⁴⁾

^{1, 2, 3, 4)} Lecturer dan Student Regional and Urban Planning Study Program, Faculty of Science and Technology, University of Amal Ilmiah Yapis Wamena, Indonesia
e-mail: aprianto1488@gmail.com^{1)*}, hardiyantiymssibio@gmail.com²⁾

ABSTRACT

Wesakin Village, Wouma District, is an area located on the banks of the "Uwe" river. Rivers are very important for the survival of the people living in the village. The "Uwe" river should be preserved but the current situation is the opposite. The preservation of the "Uwe" river has received little attention from the government, whether in terms of transportation facilities, residential facilities or infrastructure in accelerating regional development. Wesakin Village has been one of the areas affected by natural disasters since in the last 5 years, the impact of this phenomenon resulted in damaged infrastructure. This research uses qualitative methods, while data collection techniques in this research include observation, interviews, documentation and literature study. The results of this research show that there are morphological changes in the residential area on the banks of the "Uwe" river, which used to be just an ordinary river bank, but as time goes by, there is residential development where the banks of the "Uwe" river, settlements are now starting to become disorganized due to natural disasters such as landslides and flash floods. which once affected Wesakin Village. There are two morphological changes, namely morphological changes in community residential areas and natural morphological changes that occur in changes in the structure of soil and rocks.

Keywords: Rivers, Jayawijaya, Landslides, Morphology, Infrastructure (:)

I. PENDAHULUAN

Geographical conditions such as topography, geology, land use and population growth are the main factors triggering increasingly severe floods and tidal waves. Human activities and interactions with the environment and buildings have an influence on rivers, these activities are the influence on capacity such as troughs, cutouts, mining commodity excavations or C excavations and the location of bridges. According to (Setyaningsih et al., 2019) The increasing needs required by The community's access to food land will lead to human expansion into green areas to carry out residential development.

This can have a detrimental effect on river flow areas quickly downstream and can cause sedimentation and the formation of deltas when the water flow is small because people cannot see what future impacts this will have. Natural factors can influence the physical processes of river morphology. Activities that occur in the field in land use in the

upstream part of the watershed can result in damage to the recharge zone from all human activities causing high overland flow as a result of reduced infiltration (Ekasari et al., 2022). In line with the opinion of Consequences. In accordance with the flow of water flowing downstream. There are several forms of river channels, namely braided streams, meandering rivers, meandering processes, embankments and natural swamps.

Degradation can be interpreted as an event that lowers the river bed over long distances. Degradation can occur downstream or upstream of the river and can occur simultaneously over a certain period of time. States that land degradation is a reduction in the ability of land to produce benefits and profits from land use and land management itself from land damage characterized by a decline in both temporary and permanent land production capacity (Tutuarima, 2021). As a result, river bed degradation occurs when the incoming sediment is less than its carrying capacity, the river bed erodes, and the river bed decreases. Degradation is a long-term process of river bed evolution. River flow in the process of river bed degradation is in the form of quasi unsteady and non-uniform flow. In contrast, river flow at the beginning and end of the degradation process is a steady and uniform flow.

Degradation in downstream rivers can be caused by development and land use. Apart from that, this degradation can also be caused by an increase in water discharge due to flow diversion and flooding. Other factors that can cause downstream degradation include a decrease in the size of river bed material due to river processes, and melting of subsurface ice layers.

Degradation in upstream areas can occur due to a decrease in the bottom surface due to the collapse of the surface of the lake or main river, as well as excavation of river bed material. Apart from that, the reduction in river length due to cutting, channeling, current capture, and horizontal bed shifting can also cause degradation.

Wesakin Village is located in Wouma District, Jayawijaya Regency, Papua Mountain Province. The distance is ± 4 km from the Wamena City Cross Monument ± 15 minutes. Wesakin Village is close to the Wamena city area and the people in Wesakin Village are homogenous people who have the same work background. Based on temporary observations made by the author, the degradation and landslide incidents in Wesakin Village, a settlement located on the banks of the "Uwe" river, do not comply with applicable regulations. because there is almost no distance between the community settlements in Wesakin Village and the river bank. The researchers are interested in conducting research to see changes in the morphology of the "Uwe" riverbank area in Wesakin Village. With the aim of being able to find out the causes of changes and providing an overview for the people living in Wesakin Village to love the environment more and be wise in managing land in riverside areas. And can be used as a reference in implementing community service related to natural disaster mitigation.

II. METHODS

The research method used in this research is the qualitative method. Direct observation in the field was carried out to strengthen data analysis. The researchers used data collection techniques by conducting observations, interviews, documentation, and combining the findings with several literature studies.

The research instruments are key instruments in qualitative research. The researcher acts as a key instrument (researcher as key instrument) or the main role is that qualitative

researchers collect data themselves through documentation, behavioral observation and interviews (Creswell, 2010). This human instrument was built on the basis of knowledge and uses methods that are in accordance with research demands. Qualitative research, data collection is carried out in a "natural setting" (natural conditions).

Observation or observation is an activity towards a process or object with the aim of feeling and then understanding the knowledge of a phenomenon based on previously known knowledge and ideas. In this research, we carry out direct activities and observe Wesakin Village as an object and subject to obtain information or knowledge that will be related to science.

In-depth interviews are the process of exploring information in depth, openly, and freely with problems and focus on research and are directed towards research. In this study, researchers conducted interviews by asking questions directly to the people of Wesakin Village to explore information openly.

Literature study is a research approach carried out by looking for relevant references or theoretical bases according to the research topic to be studied or being researched. The author looks for references through books and journals accessed online to strengthen the arguments in the discussion in this research.

The final step of data analysis is drawing conclusions. The qualitative analysis step is drawing conclusions and verifying the initial conclusions put forward which are still temporary, and will change if strong supporting evidence is not found at the next stage of data collection (Miles and Haberman in Sugiyono, 2012). The researcher draws conclusions from the data that has been obtained and presents them regarding morphological changes on the banks of the " Uwe" river. This conclusion is drawn in the final chapter which is accompanied by suggestions and recommendations on this problem.

III. RESULTS AND DISCUSSION

The results of this research or findings in this research are that the morphological changes that occurred in Wesakin village are clearly visible because they can be seen from the damaged buildings located on the banks of the " Uwe" river, which is caused by the impact of the landslide disaster. which occurred in 2017. The landslide incident that occurred in Wesakin Village in 2017 occurred due to the movement of masses of soil, rocks or a combination thereof, according to the head of Wesakin Village.

The " Uwe" riverbank area as the location in this research is a slope area located in an area of high topography and rocks so it has the potential for landslides to occur. The river border area is land, the river border is an area bounded by the outer river security boundary line which limits the construction of buildings on the river bank and is designated as river protection (Dasuka, 2015).

In line with the opinion of (Kasba, 2018) river borders protect rivers from morphological changes such as scouring, erosion and pollution, and rivers also have biodiversity and value as well as high landscape beauty. Landslides that occur on the banks of the " Uwe" river are a form of natural phenomenon that seeks a new balance due to disturbances or influencing factors which cause a reduction in shear strength and an increase in soil shear stress, this can be proven by the road that connects Wouma District and Walesi was damaged so that Wesakin Village, which we wanted to access, was hampered, which of course had an impact on the economy of the surrounding community

and also other impacts, such as several residents' houses being carried away by the river current when heavy rain occurred. The result of the landslide disaster that occurred in 2017 certainly brought morphological changes to Wesakin village until now. The findings in this research are two types of morphological changes, namely changes in the morphology of residential areas and changes in natural morphology.

Changes in the morphology of residential areas that occurred were damage to infrastructure in Wesakin Village due to landslides. Landslides can cause damage to infrastructure around river banks. Damage to building construction, transportation routes, and information systems made it difficult to reach Wesakin Village, secondly, people lost their homes. Seeing conditions like this, disaster mitigation is very necessary. Changes in land use can be seen from the development of river morphology (winding or braiding, aggradation or degradation) which must be considered and adjustment activities carried out immediately so that in the future it does not endanger infrastructure (Moerwanto, 2020).



Figure 1. Condition of the Uwe River Banks

Natural morphological changes that occur are changes in the structure of soil and rocks. The landslide that occurred in Wesakin village is a type of debris flow landslide where this type of landslide occurs when a moving mass of land is pushed by water. The flow speed depends on the slope, the volume and pressure of the water, and the type of material. Apart from that, it can be influenced by several natural factors including geographical conditions, and also accessibility which has an impact on land changes, especially economic activities, which automatically change the socio-economic conditions of the community (Patandean, 2021 in Putra et al.,



Figure 2. Natural Morphological Changes

This landslide occurred because of additional loads such as the weight of residential buildings on the slopes, as well as vehicles that were still passing Wesakin Village, which would increase the driving force for the landslide to occur. There is a great need for cooperation between the community and the village and local government to realize the development of village or village potential so that sustainable environmental management can be created (Arida, 2022).

If there is no attention from the community and government, it could result in land subsidence and cracks leading towards the valley, causing landslides in Wesakin Village to occur. Another thing that caused the landslide in Wesakin village was that the people had the habit of building their homes too close to the river, the distance between the river and community settlements was 2 meters and from the main road it was 1 meter. Another cause of landslides is inappropriate use and management of land in river basins (DAS) because this can make the soil less strong and less stable so that the soil becomes weak. In line with the opinion of (Ramadhani et al., 2021) River Watersheds are ecosystem areas with various functions and have an essential role in supporting life within them, so that their hydrological and ecological conditions must always be balanced and orderly. Rivers have a very important role in the urban context as an effort to maintain sustainable water needs and resources (Kusuma, 2019).



Figure 3. Appearance of the "Uwe" river

The high intensity of rain causes the slopes in Wesakin Village to become saturated with water because rainwater enters the ground. Rainfall has a pattern that follows temporal and spatial characteristics which are influenced by the variety of an area's topography and climatology (Prayuda, 2015). The change in morphology in the residential area on the banks of the " Uwe" river is something that is very clear, initially " Uwe" was just a river but now there are community settlements. Another cause of landslides is inappropriate land use because this can make the soil less strong and less stable so that the soil becomes weak. The presence of humans in an area as a use of land in the future will determine the activities that have been carried out regarding land management as triggers for bigger disasters or preventing disasters (Ekasari et al., 2022).

The landslide disaster that occurred on the banks of " Uwe" in Wesakin Village certainly brought morphological changes. The morphological changes that occur are changes in the morphology of residential areas and changes in natural morphology. Community life and culture should grow and develop along with city development.

Humans occupy their residential environment according to environmental preferences which involve understanding the characteristics of nature and humans and their reciprocal relationships (Putro & Nurhamsyah, 2015). Likewise with changes in morphology in Wesakin Village. Lack of support and attention from the government, people who do not understand disaster mitigation knowledge have resulted in villages experiencing changes in the shape of the earth's surface. Many people have moved to other areas because all existing infrastructure has been damaged and there is a fear that the disaster will happen again, but many people still choose to stay because they have no choice and do not have land other than in this village.

The river means a lot to the people, so to carry out their daily lives they choose to live on the banks of the river because it will make it easier for them to get water. In general, the function of the river is from the point of view of the local community in this village. Until now, the residents who survive on the banks of the river are residents who have lived for generations and depend on the river for their livelihood. The change in morphology in the residential area on the banks of the "Uwe" river is very clear. The change in morphology on the river banks causes the loss of local potential in Wesakin village. It is hoped that in the future this area will receive more attention considering its location is very close to the main city of Wamena.

IV. CONCLUSIONS

Morphological changes in the residential areas on the banks of the Uwe River are very obvious, initially the Uwe River was just a river but now there are community settlements. The landslides that occurred in this area were caused by additional loads such as the weight of residential buildings on the slopes and the activity of vehicles passing through the connecting road between the two districts. Another cause of landslides is inappropriate land use because this can make the soil less strong and less stable so that the soil becomes weak. This landslide disaster certainly brought about morphological changes. This landslide disaster certainly brought about morphological changes on the banks of the "Uwe" river. Which will bring changes to the shape of the earth's surface and also have an impact on humans.

DAFTAR PUSTAKA

Journal Article:

- [1] Arida, V., Laksani, M. R. T., & Handini, A. F. D. (2022). PetaKita sebagai Upaya Awal Konservasi Lingkungan di Desa Warnasari Kecamatan Pangalengan Kabupaten Bandung. *Media Komunikasi Geografi*, 23(2), 252–264. <https://doi.org/10.23887/mkg.v23i2.55016>
- [2] Dasuka, Y. P., Sasmito, B., & Hani'ah. (2015). Analisis Ketertiban Tata Letak Bangunan Terhadap Sempadan Sungai Di Sungai Banjir Kanal Timur Kota Semarang. *Jurnal Geodesi Undip*, 4(3), 86–94.
- [3] Ekasari, A. M., Burhanudin, H., & Fardani, I. (2022). Analisis Kualitas Sub DAS Citarum Hulu. *Media Komunikasi Geografi*, 23(1), 44–57. <https://doi.org/10.23887/mkg.v23i1.40612>
- [4] Hardhoni, W. D., Suratman, S., & Mardiatno, D. (2021). Tingkat Bahaya Longsorlahan di Sub DAS Ngrancah Kabupaten Kulonprogo. *Media Komunikasi Geografi*, 22(1), 75. <https://doi.org/10.23887/mkg.v22i1.31099>
- [5] Kasba, P. S., Rachman, T., & Paotonan, C. (2018). Kesadaran Masyarakat Kota Sungguminasa Tentang Sempadan Sungai Sesuai Undang-Undang No 1 Tahun 2014. *Seminar Sains Dan Teknologi Kelautan*, 1, 40–44.
- [6] Kusuma Putri, M., Septinar, H., & Wulandari Daulay, R. (2019). Analisis Pengaruh Pengelolaan Lingkungan terhadap

- Kondisi Masyarakat Hilir Sungai Musi. *Jurnal Geografi*, 16(2), 80–89. <https://doi.org/10.15294/jg.v16i2.18955>
- [7] Moerwanto, A., & Zulfan, J. (2020). Mitigasi Bencana Alam Pada Infrastruktur Jalan dan Jembatan I. *Jurnal Himpunan Pengembangan Jalan Indonesia*, 6(1), 1–14.
- [8] Prayuda, D. D. (2015). Analisis Karakteristik Intensitas Hujan di Wilayah Lereng Gunung Merapi. *Jurnal Rekayasa Infrastruktur*, 1, 14–19. <https://rekayasainfrastruktur.unwir.ac.id/index.php/jri/article/view/52>
- [9] Putra, S. M., Latief, R., & Suaeb, I. (2022). Pengaruh Perubahan Morfologi Kota Terhadap Pembentukan Struktur Ruang Kota Kupang. *Urban and Regional Studies Journal*, 4(2), 102–109. <https://doi.org/10.35965/ursj.v4i2.1465>
- [10] Putro, J. D., & Nurhamsyah, M. (2015). Pola Permukiman Tepian Air, Studi Kasus: Desa Sepuk Laut, Pungur Besar Dan Tanjung Saleh Kecamatan Sungai Kakap, Kabupaten Kubu Raya. *Langkau Betang: Jurnal Arsitektur*, 2(1), 65–76. <https://doi.org/10.26418/lantang.v2i1.13841>
- [11] Ramadhani, E., Suprayogi, S., & Hadi, M. P. (2021). Pengaruh Perubahan Penggunaan Lahan Terhadap Limpasan Menggunakan Multidata Iklim Satelit di Sub DAS Samin. *Media Komunikasi Geografi*, 22(1), 31. <https://doi.org/10.23887/mkg.v22i1.30589>
- [12] Setyaningsih, W., Sriyono, S., & Benardi, A. (2019). Kajian Kerusakan Lahan Di Daerah Aliran Sungai (Das) Kreo Akibat Pembangunan Pemukiman Di Sekitar Waduk Jatibarang Kota Semarang. *Media Komunikasi Geografi*, 19(2), 177. <https://doi.org/10.23887/mkg.v19i2.16027>
- [13] Tutuarima, C. T., Talakua, S. M., & Osok, R. M. (2021). Penilaian Degradasi Lahan dan Dampak Sedimentasi terhadap Perencanaan Bangungan Air di Daerah Aliran Sungai Wai Ruhu, Kota Ambon. *Jurnal Budidaya Pertanian*, 17(1), 43–51. <https://doi.org/10.30598/jbdp.2021.17.1.43>
- Book:
- [14] Creswell, John. W. (2010) *Research Design: Pendekatan Kualitatif Dan Kuantitatif, Dan Mixed*. Yogyakarta: Pustaka Pelajar.
- [15] Sugiono. (2012). *Metode Penelitian Kuantitatif Kualitatif Dan R & D*. Bandung: Alfabeta