

Contextual Geography Learning Based on Field Observation on the Physical Characteristics of the Alo Watershed

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Abstract

Geography learning demands an integration between conceptual understanding and empirical experience through direct observation of geospherical phenomena. However, geography learning is still often abstract and has not made optimal use of the surrounding environment as a source of contextual learning. This study aims to examine the geographical physical characteristics of the Alo Watershed (DAS) as a context of contextual geography learning based on field observation. This study uses a qualitative descriptive approach with a case study method carried out in the Alo watershed, Gorontalo Province. Data collection is carried out through field observation, documentation, and spatial data analysis which includes aspects of geomorphology, geology, hydrology, pedology, and biogeography. The results of the study show that the Alo watershed has an integrated geographical physical characteristics that are spatially arranged from upstream to downstream and can be observed directly in the field. These characteristics are not only available as physical phenomena, but also serve as sources and objects of geography learning that support contextual learning based on field observations. This study concludes that the Alo watershed has the potential to become an integrative and meaningful geography learning context and opens up opportunities for the development of local environment-based geography learning in a sustainable manner.

Keyword: contextual learning; field observation; watershed; natural laboratory

INTRODUCTION

Geography learning has distinctive characteristics that emphasize the understanding of

geosphere phenomena spatially, integratively, and contextually. Therefore, the learning of geography should ideally be oriented not only to the mastery of theoretical concepts, but also to empirical experience through direct observation of the real environment. Various studies have shown that contextual learning is able to improve students' concept understanding, critical thinking skills, and spatial thinking skills when the material is associated with the surrounding environment conditions (Downs & Liben, 1991; Wijayanto et al., 2020; Aini et al., 2022).

However, in practice, geography learning is still often dominated by an abstract and textual classroom approach. Field observation-based learning activities have not been systematically integrated in learning planning, so the potential of the environment as a contextual learning resource has not been optimally utilized (Wilson et al., 2017; Ali et al., 2024). This condition has an impact on the limited development of observation skills and the meaning of geographical phenomena as a whole.

The contextual learning and place-based education approach emphasizes the importance of the relationship between the learning material and the context of the space in which students live and interact. The local environment is seen as a natural laboratory that provides real phenomena to support experiential learning (Kolb & Kolb, 2005; Stewart, 2008; Chilungo Jana, 2020). In the context of geography, the use of the environment as a natural laboratory has been proven to be able to improve the quality of learning and student involvement (As'ari & Mulyanie, 2019; Dewi et al., 2021).

Watersheds (watersheds) are geographical area units that naturally show the integration of geomorphology, geology, hydrology, pedology, and biogeography aspects in one complete system. Several studies have shown that watersheds have great potential as a field-based geography learning context because they represent the interaction between geosphere components in real terms (Vallor et al., 2016; Mukminan et al., 2024). One of the areas that has these characteristics is the Alo watershed in Gorontalo Province, which shows variations in land shape, rock distribution, river network, soil type, and land cover from upstream to downstream (Lihawa, 2014; Lihawa et al., 2015).

Based on these conditions, this study aims to examine the physical characteristics of the Alo watershed as a contextual geography learning context based on field observation, by emphasizing the integration of geographical physical aspects in a unified learning area.

METHOD

Types and Approaches to Research

This study uses a qualitative descriptive approach with the type of case study research.



This approach was chosen to describe in depth the physical characteristics of the Alo Watershed and its use as a contextual geography learning context based on field observation. Qualitative descriptive research allows the disclosure of geographical phenomena based on real conditions in the field without providing treatment or manipulation of the research variables.

The approaches used in this study include contextual approaches and spatial approaches. The contextual approach is used to examine the relevance of geographical physical characteristics to the needs of geography learning, while the spatial approach is used to understand the integration and distribution of geomorphological, geology, hydrology, pedology, and biogeographic aspects in a single watershed area from upstream to downstream.

Location and Research Subject

The research was carried out in the Alo Watershed, Gorontalo Province. The selection of the research location was based on the diversity of geographical physical characteristics that are spatially arranged and can be observed directly in the field, as well as their relevance as a local environment-based geography learning context.

The subject of the study is the geographical physical characteristics of the Alo watershed, which includes aspects of geomorphology, geology, hydrology, pedology, and biogeography. The focus of the research is directed at physical geographical phenomena that can be observed directly and interpreted as a source and object of geography learning based on field observation.

Research Stages

The research stages are systematically arranged to ensure the integration between the objectives, processes, and results of the research. The stages of the research include: Problem Identification and Determination of Research Focus The initial stage was carried out by identifying geography learning problems related to the limitations of environmental use as a contextual learning resource, and establishing the Alo watershed as the focus of the study.

Data Collection

Data collection is carried out through field observation and spatial data collection. Spatial data include geomorphological maps, geology, river networks, soil types, and land cover used to describe the physical geographical characteristics of the Alo watershed.

Early Identification and Analysis of Geographic Physical Characteristics At this stage, the identification of each geographical physical aspect is carried out based on spatial data and the





results of field observations. The initial analysis was carried out descriptively to understand the distribution and integration of physical geographical characteristics in the watershed area.

Integrated Field Observation

Field observations were carried out systematically on the trajectory of the upstream-middle-downstream area of the Alo watershed to verify spatial data and directly observe geomorphological, geology, hydrology, pedology, and biogeography phenomena relevant to geography learning.

Synthesis and Preparation of Research Results

The final stage is in the form of a synthesis of analysis results to affirm the use of the physical characteristics of the Alo watershed as a contextual geography learning context based on field observation.

Data Collection and Analysis Techniques

The data collection techniques in this study include field observation, documentation, and spatial data analysis. Field observation was used to obtain empirical data on physical geographical characteristics that could be observed directly, while documentation was carried out through taking field photos and recording the physical condition of the research area.

Data analysis was carried out using qualitative descriptive analysis with a spatial approach. Spatial data were analyzed to illustrate the distribution and integration of physical geographical characteristics within the Alo watershed area. The results of the analysis were then synthesized and presented in the form of a scientific narrative that followed the stages of the SCI method, thus supporting the drawing of conclusions about the use of the Alo watershed as a context of geography learning based on field observation.

RESULTS AND DISCUSSION

The availability of physical geographical characteristics that can be observed directly in the Alo Watershed provides a solid basis for its use as a natural laboratory in geography learning. This area shows a variety of geomorphological phenomena, such as hilly land forms, floodplains, and naturally developing river flow patterns.



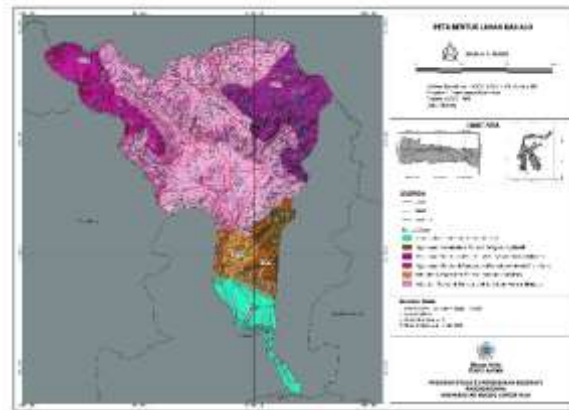


Figure 1 Landform Map

In terms of geomorphological aspects, the Alo watershed shows a variety of land forms that include mountains and hills in the upstream area, transitional zones in the form of denudational hills in the central part, and alluvial plains in the downstream area. The variations in relief and slope slope can be observed directly in the field and represent geomorphological processes that develop naturally in a single watershed system.

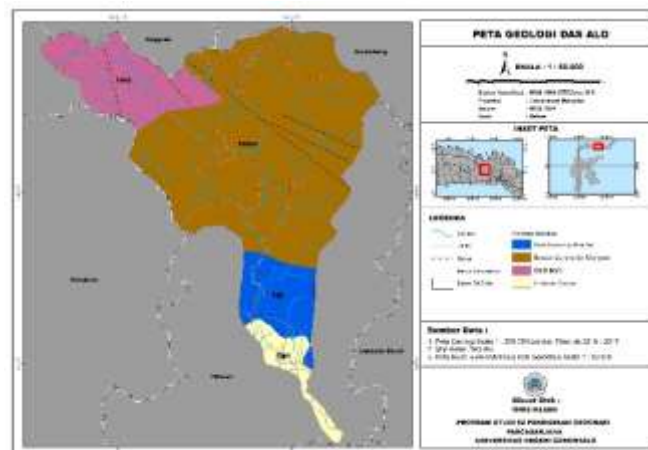


Figure 2 Geological Map

Geological maps of the Alo watershed area show a diverse distribution of rock units arranged according to regional configuration. Volcanic rocks dominate the upstream and part of the central region, while carbonate rock units and loose deposits develop in the central to downstream zones. The presence of rock outcrops and geological structures at several locations

allows direct observation of the relationship between lithology and landforms. This condition shows that the geological characteristics of the Alo watershed are available in real terms and can be used as field observation objects.

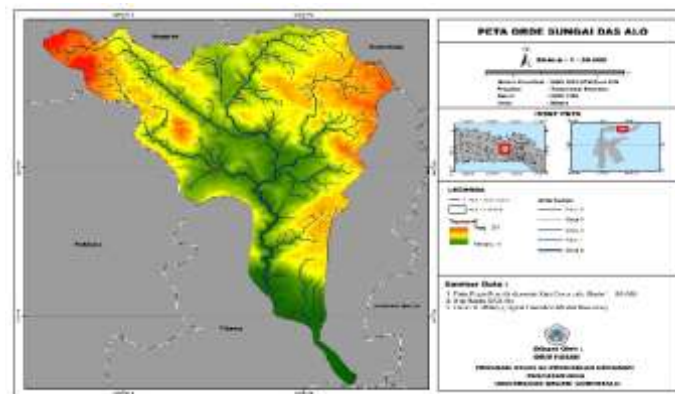


Figure 3 Hydrological Map

In terms of hydrology, the Alo watershed has a river network system that is arranged hierarchically and integrated. Low-order rivers develop in the upstream area, then merge to form medium-order rivers in the central part, and emphasizes the main river in the downstream area. The flow pattern reflects the relationship between relief, lithology, and fluvial processes, and can be observed directly through the observation of river channels and the branching of drainage networks in the field.

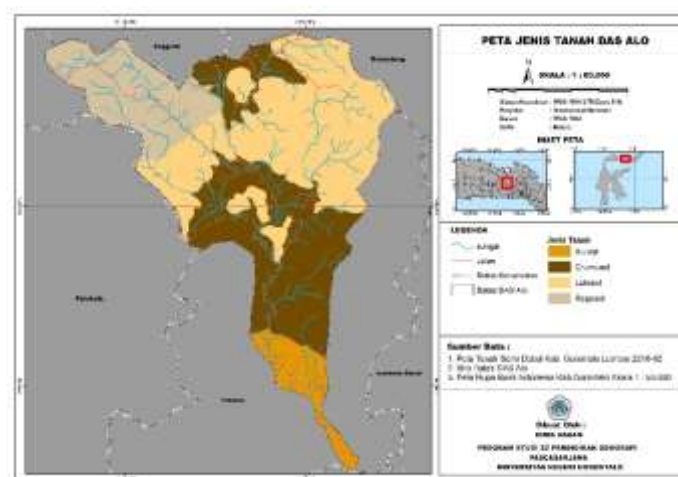


Figure 4 Map of Soil Type

The pedological aspects of the Alo watershed show the variation in soil types that follow changes in topography and spatial position within the watershed. Developing soils differ in sloped areas, transition zones, and lowlands, thus showing the relationship between the soil formation process and geomorphological and hydrological conditions.

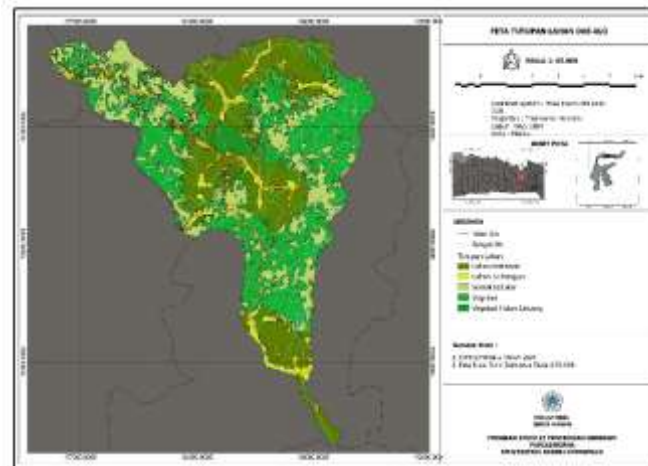


Figure 5 Land Cover Map

In terms of biogeography, the Alo watershed shows a variety of land cover that includes forested areas, shrubs, agricultural land, and built land. The diversity of land cover reflects the interaction between the physical conditions of the area and human activities, and can be observed directly in the field. Overall, these results show that the Alo watershed provides real and observed geographic physical characteristics as the main prerequisite for field observation-based geography learning.

This discussion shows that the Alo Watershed (DAS) has complete geographical physical characteristics and is easy to observe directly in the field, including aspects of geomorphology, geology, hydrology, pedology, and biogeography. Variations in land shapes, rock units, river networks, soil types, and land cover are presented spatially and integrated into one watershed area. This integration makes the Alo watershed provide concrete, actual, and contextual geographical objects and phenomena as the foundation for geography learning based on field observation.

The visibility and integration of the physical geographical characteristics of the Alo watershed is closely related to its function as a natural area unit that integrates various endogenous and exogenous processes. This finding is in line with previous research that confirms that the diversity and interconnectedness of geomorphological, geological, and hydrological aspects in a watershed is the main prerequisite for the development of experiential learning-



based geography natural laboratories (As'ari et al., 2019; Vallor et al., 2016; Mukminan et al., 2024). In addition, the use of the local environment as a learning context has been shown to strengthen contextual geography learning and improve the meaning of concepts through hands-on experience in the field (Kolb & Kolb, 2005; Stewart, 2008; Hamilton & Marckini-Polk, 2023). Thus, the use of the Alo watershed as a learning context is not only academically relevant, but also contributes to strengthening applicable and sustainable geography learning.

CONCLUSION

This study demonstrates that the Alo Watershed possesses comprehensive and spatially integrated physical geographic characteristics that can be directly observed in the field, encompassing geomorphological, geological, hydrological, pedological, and biogeographical aspects. The variation and continuity of these physical features from upstream to downstream areas reflect the natural structure and processes of a watershed system, providing concrete and contextual phenomena that are highly relevant for geography learning.

The findings confirm that the Alo Watershed functions effectively as a natural laboratory that supports contextual geography learning based on field observation. The direct observability of landforms, rock units, river networks, soil types, and land cover enables learners to connect theoretical concepts with real-world geographic phenomena, thereby strengthening spatial understanding, integrative thinking, and experiential learning. This condition aligns with the principles of contextual learning and place-based education, which emphasize the importance of local environments as meaningful learning resources.

Furthermore, the integrated physical characteristics of the Alo Watershed offer strong potential for developing sustainable, environment-based geography learning models. However, the effective utilization of the watershed as a learning context requires systematic planning, instructional integration, and adequate field-based learning design. Future studies are encouraged to explore the development and evaluation of instructional models, learning materials, and assessment strategies that explicitly incorporate watershed-based field observation to enhance the quality and relevance of geography education..

REFERENCE

- Aini, Q., Hayati, N., & Widodo, S. (2022). Enhancing students' critical thinking and analytical skills in geography through problem-based learning. *Journal of Geography Education*, 11(1), 30–42.





- Ali, M. K., Ali, A. M., & Hasanah, A. (2024). Challenges in implementing contextual teaching and learning: A teacher perspective study. *Horizon: Indonesian Journal of Multidisciplinary*, 2(2), 66–80.
- As'ari, R., & Mulyanie, E. (2019). The use of local landscape as a field laboratory for geography education. *SPATIAL Journal of Geographical Studies*, 19(2), 1–7.
- Chilungo Jana, D. A. (2020). Exploring place-based education in geography teaching and learning as a means to (re-)engage students in Malawi (Master's thesis). Stellenbosch University. <https://scholar.sun.ac.za>
- Dewi, S., Hadi, H., & Agustina, S. (2021). Studi kelayakan Kebun Raya Lemor sebagai laboratorium alam untuk pembelajaran geografi. *Geodika: Jurnal Kajian Ilmu dan Pendidikan Geografi*, 5(2), 291–302. <https://doi.org/10.29408/geodika.v5i2.4330>
- Downs, R., & Liben, L. (1991). The development of expertise in geography: A cognitive-developmental approach to geographic education. *Annals of the Association of American Geographers*, 81(2), 304–327. <https://doi.org/10.1111/j.1467-8306.1991.tb01692.x>
- Hamilton, E., & Marckini-Polk, L. (2023). The impact of place-based education on middle school students' environmental literacy and stewardship. *Cogent Education*, 10(1). <https://doi.org/10.1080/2331186X.2022.2163789>
- Kolb, A., & Kolb, D. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning and Education*, 4(2), 193–212. <https://doi.org/10.5465/amle.2005.17268566>
- Lihawa, F. (2014). Daerah Aliran Sungai Alo, erosi, sedimen dan longsoran. Yogyakarta: Deepublish.
- Lihawa, F., Patuti, I. M., & Nurfaika, N. (2015). Sebaran aspek keruangan tipe longsoran di daerah aliran sungai Alo Provinsi Gorontalo. *Jurnal Manusia dan Lingkungan*, 21(3), 277–285. <https://doi.org/10.22146/jml.18554>
- Mukminan, Ashari, A., Purwantara, S., & Sumunar, D. R. S. (2024). Opak-Progo watershed's potential for geography experiential learning. *Jurnal Pendidikan Geografi: Kajian, Teori, dan Praktik dalam Bidang Pendidikan dan Ilmu Geografi*, 29(1), 78–94. <https://doi.org/10.17977/um017v29i12024p78-94>
- Stewart, A. (2008). Whose place, whose history? Outdoor environmental education pedagogy as “reading” the landscape. *Journal of Adventure Education & Outdoor Learning*, 8(2), 79–98. <https://doi.org/10.1080/14729670801906125>





- Vallor, R. R., Yates, K. A., & Brody, M. (2016). Delphi research methodology applied to place-based watershed education. *Education Sciences*, 6(4), 42. <https://doi.org/10.3390/educsci6040042>
- Wijayanto, B., Sutriani, W., & Luthfi, F. (2020). Kemampuan berpikir spasial dalam pembelajaran abad ke-21. *Jurnal Samudra Geografi*, 3(2), 42–50. <https://doi.org/10.33059/jsg.v3i2.2495>
- Wilson, H., Leydon, J., & Wincentak, J. (2017). Fieldwork in geography education: Defining or declining? The state of fieldwork in Canadian undergraduate geography programs. *Journal of Geography in Higher Education*, 41(1), 94–105. <https://doi.org/10.1080/03098265.2016.1260098>

