

# Utilization of Local Landscape for Educational Field Laboratory Geography

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## Abstract

Geographical skills that need to be shared by each geographer in general are map skills, field skills, and satellite image interpretation skills. To achieve field skills competency, a location is needed to be used as material for practicum studies for each subject. The Geography Education Field Laboratory can be studied in depth based on an analysis of the level of learning needs. The basis of the lab location requirements as a laboratory is seen from the laboratory function as an area to carry out careful and accurate testing and measurement of the phenomenon under study. The study was carried out through the identification of local landscapes by delineating the area through the utilization of satellite imagery, and identifying potential from each area that was chosen descriptively. In this study, the Galunggung Volcanos area can be used as a Physical Field Laboratory for Geography and Kampung Naga Education can be used as a Field Laboratory for Social and Cultural Geography.

## Keywords

Utilization, Local Landscape, Laboratory, Geography

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## Introduction

The ability to solve problems and make decisions is a very important thing to be mastered by students. Learning carried out in the classroom in general has provided knowledge and experience to students to obtain knowledge information. Geography teachers are not limited to transferring theoretical geography only. In addition, it also has the responsibility to improve students' intellectual abilities, especially to develop relevant skills in problem solving and decision making. This can only be obtained by field learning. Geography education requires models, visuals, modules, and learning in the field that are relevant to geosphere learning to achieve learning competencies. In addition, the need for research in the development of geography requires detailed and in-depth analysis, so that it requires a minimum standard of geography laboratory. The need for applied research in geography must be able to provide solutions related to location suitability. Remembering location is an important thing in geography.

The need for a comprehensive geography study model so that it can show the public a geographical solution to certain environmental problems. Field laboratories are needed to support learning in the classroom. Considering lab work in the laboratory, field observations and field trips are a fundamental part of many earth sciences, environmental sciences and geograph (As'ari et al., 2019). Open space offers opportunities that are not found in the room and the physical environment contributes to the learning of students with their abilities. Open spaces designed with learning needs are very important because they can be more meaningful and useful when they contribute to the implications of learning in the classroom. One way to develop an understanding of a scientific study is to learn from experience. The involvement of students in practicums in the field can show that they make improvements to their conceptual knowledge, which then leads to an in-depth understanding of a theory (Angelstam et al., 2013). Spatial ability is the mental capacity to manipulate visual patterns, as indicated by the degree of difficulty and complexity in visual stimulus materials that can be handled successfully (As'ari et al., 2019). In geography spatial ability is one of the important ability to be owned by geographers, considering geographical skills in general have three main skills, namely: map skills, field skills, and photographic interpretation skills (Achmad et al., 2012) with spatial skills can understand environmental characteristics, problems that occur in the environment and solving the problem in a room.

As possessed by the KSDH Field Laboratory (Forest Resource Conservation) and Ecotourism in the Education Forest of Hasannudin University, it has the potential of diverse flora and fauna which must be developed for the purpose of education, research and community service (As'ari et al., 2019). The same thing was done by (Butzow, 2019) who reviewed the Potential of Rembang Regency as Geowisata and Geography Field Laboratory. The function of the field laboratory can be used as a geo-study, where study activities in the open; include field observation, photography, landscapes, natural resource studies, and geography learning. This can be used as a reference for developing similar things in Tasikmalaya. Given the potential that Tasikmalaya has is very diverse both in terms of aspects of physical, social and cultural diversity. This can be used as capital to develop a field laboratory for the Department of Geography Education, Siliwangi University. Local landscape conditions that can be used as a field laboratory for geography education can be assessed based on the field of study and the need for geosphere analysis (lithosphere, hydrosphere, atmosphere, biosphere and anthroposphere).

## Research Methods

The study of local potential for development as a Geography Education Field Laboratory in this case is examined based on two aspects, namely: Physical geography and Social and cultural Geography. Identification is done based on the complexity of field needs based on the scientific family of Geography. Regional analysis is carried out in several stages: delineating the area by utilizing satellite imagery, field surveys, and the study only focused on two analyzes: field needs analysis for the study of Physical Geography (Hydrosphere, Biosphere, and Lithosphere, and Landscape) and Social Geography Studies and Culture. The study was carried out with descriptive analysis at two locations, namely: Galunggung Volcano and Kampung Naga. These considerations are based on the consideration that the regions owned by the two regions have the potential to serve as functions of the geography education field laboratory.

## Result and Discussion

### Geography Education Laboratory

Laboratory type classification based on activities, including: Basic laboratory (practicum), Research laboratory (final project, lecturer research), Service laboratory (test and calibration), and Integrated natural or regional laboratory (Field Laboratory) The stages for analyzing the needs of field laboratory studies in the Galunggung Volcano area are carried out with the Stages of Identification needs, with reference to the learning outcome program and the learning course. An integrated type of laboratory is located in a faculty or university study center, or a technical implementing unit that organizes education and / or training with supporting facilities for category I, II, and III equipment, and managed materials are general and special categories of material for serving research activities, and community service, students and lecturers. The characteristics of the right learning model for Geography Education field laboratories can be done in several stages, namely:

#### Management of basic material

Material is the basic material of learning activities, material is a material that must be conveyed and understood by students to improve competence. Material is included in learning planning preparation. Based on direct observations in the field, teaching materials have a very important function because the abilities to be formed in the learning process are closely related to the material that must be learned.

#### Management of learning interactions

Educative interaction is reciprocal communication between one party with another party, it already contains certain intentions, namely to reach a shared understanding which is then to achieve goals (in learning activities means to achieve learning goals). Based on observations in the field students feel more interested in following learning when dealing directly with real objects. This can be seen from the activity of students in making observations about an object. In the use of the environment as a learning resource, there is normative educative interaction through activity-based teaching; in addition the opportunity to explore and interact in groups will make students feel less stressed. Providing opportunities for students to use more time to make observations, experiments and discussions are some of the things that can be done to create fun learning.

#### Management of evaluation of Geography learning

Evaluations that can be carried out are several techniques, including written evaluation and verbal evaluation. This is done according to the needs of the value to be taken. Evaluations can be carried out regularly to see the focus to be achieved in learning activities. In this study the focus observed was cognitive, affective and psychomotor research. Written tests can be categorized into two, namely objective tests and description tests that can function to measure the cognitive domain.

#### Space Potential of Galunggung Mountain Area as Physical Geography Education Laboratory

Geography is best learned through field observation investigations, or exploring a geosphere phenomenon. Geographic phenomena are often the core of topics and problems that are directly relevant to students' lives (Carroll, 1993). The most prominent field guide activity for me is a sense of place assignment. Direct experience of landscapes immerses us in physical and human character, spatial arrangement, environmental quality, scenery, sound, texture, taste and aroma. The experience of landscape immersion evokes various feelings and thoughts. The mind revolves around our personal conceptual framework. Feelings arise from our emotional state. Our experience is a mixture of objective and subjective reality (Edelson, 2009). The Galunggung Volcano area is administratively included in the government of Sukaratu District, Tasikmalaya Regency. The location is about 17 km from the city center of Tasikmalaya and 8 km from the capital city of Tasikmalaya Regency. Mount Galunggung has an altitude of 2,168



meters above sea level or 1,820 meters from the mainland of Tasikmalaya City. The astronomical location is at coordinates  $7.25^{\circ} - 7^{\circ} 15'0''$  SL and  $108,058^{\circ} - 108^{\circ} 3'30''$  EL. The potential of the Galunggung Mountain Area can be used as a Field Laboratory by integrating it with tourism areas. The Galunggung area is known as a leading tourist attraction in Tasikmalaya. Because it has a very attractive natural beauty Some of the potential possessed by the Galunggung Volcano area to serve as a laboratory are:

### **1. Laboratory of Flora and Fauna Diversity**

Based on the survey in the field Galunggung area has a diversity of living things that are diverse both flora and fauna. Based on the results of the research conducted there were found 20 types from 9 families. Cichlidae are the most dominant family with six types (Kell & Lubinski, 2013). In addition to the waters, the typical plant species, namely: Anapalis Javanica, Nephentes, and Orchid can be used as research. In addition to the typical plants, the Galunggung area also contributes to the high oxygen content of the debt area which still covers most of the region. Based on this, it can be seen that 4 (four) areas that can be used as field laboratories for biosphere studies include: Wall Mount, Siang Mountain, Guntur Mountain, Beuti Canar Mountain.

### **2. Laboratory of Regional Morphology and Disaster Mitigation**

Mount Galunggung has a pretty legendary history related to the history of its eruption. Based on the history of recorded eruptions, Mount Galunggung was erupted in 1822, 1894. 1918 and last 1982. Mount Galunggung is one of the active volcanoes in Indonesia, so it has the potential to erupt suddenly. The morphology of the galunggung area has its repertoire, namely the association with the morphology of the City and Tasikmalaya Regency known as the Ten Thousand Hills of Tasikmalaya. Geologically, these hills are a natural formation which is one of the wonders of the world. There are no other ten thousand hills in this part of the world, except in Tasikmalaya. In addition, its existence can function as a natural fortress of the possibility of Galunggung lava floods. Thus the function of the Ten Thousand Hill includes Geological functions, Ecological Functions, Hydrological Functions, Aesthetic Functions, Economic Functions, Defense Functions, Educational Functions and Tourism Functions (Metoyer & Bednarz, 2017). By looking at these functions, the object of study can be adjusted to the level of need for field analysis in the Department of Geography Education. The model for the development of learning media based on the morphology of Mount Galunggung can be in the form of illustration media and Picture Media with a contextual learning approach.

Basic geography skills (Geography literacy) include understanding of the location, potential and development of the region, events that occur in the present, skills in reading maps, and using computers as geographic information. Factors that cause difficulties in teaching geography and the low level of geographical literacy between geography are part of social studies, teachers have little or no training in the development of geographic knowledge, geography learning is not integrated (human and physical) in schools, and geography is not a core lesson. Geography is a bridge of natural and social sciences. Geography studies natural forms and how natural forms affect humans, shapes the structure of human life, whereas humans always experience processes and processes that affect nature. People modify the spaces the they live in, in turn are modified by them society creates space, space create society (Monk & Alexander, 1973). Geographic thinking requires intellectual knowledge about space. Knowledge about space consists of the recognition and elaboration of the relations among spatial concepts, the advanced associations derived from these concepts, and the formal linking of the associations into theories and generalizations (Mooradian, 2002).

### **The potential of Kampung Naga Region as a Laboratory for Social and Cultural Geography Education**

Kampung Naga is located in Neglasari Village, Salawu District, Tasikmalaya Regency. The Kampung Naga community is one of the indigenous peoples in West Java that has a unique uniqueness that is different from the general settlement of the community. Kampung Naga indigenous people have an area of 1.5 ha. The specificity of the indigenous people of Kampung Naga is that it lies in its local wisdom, where the principles of life are still held firmly to this day. The community still adheres to the principles, ethics and customs practices that are still sustainable.

Cosmologically, the spatial division of Kampung Naga is divided, the spatial area is divided into three main areas, namely: Sacred area (an area that cannot be visited carelessly by people and must be preserved, clean area (area consisting of residential areas), and Kotor area (area in the valley area and outside the MCK area and domestic waste management) (Indrayati & Setyaningsih, 2017). The uniqueness of the Kampung Naga Community can be used as a study for Social and Cultural Geography. These local wisdom values can be studied in depth and used as a source of learning and research development.

Based on a study on Kampung Naga Community, there are several findings that can be used as a basis in determining the location of field studies for the development of Geography Education Field Laboratories, which include: 1) Sustainable environmental management based on local wisdom, 2) Integration of sustainable environmental management in tangible traditional forms of traditional ceremonies, 3) Basis of customary law which is still preserved in the form of taboos, prohibitions, and orders that have been internalized as a guide and principle of life, 4) System of cultural inheritance through community, family, and traditional ceremonies, and 5) Community systems and environmental management that continues from generation to generation (Peercy & Troyan, 2017).

### **Sharpening Critical Spatial Thinking Through Field Laboratories**

Critical spatial thinking is a combination of spatial concepts and geographical principles to guide and inform reasoning. Critical spatial thinking combines habits and processes of critical thinking and spatial thinking (Poulter, 1998). Ideal critical thinking is usually curiosity, knowledgeable, trusting mind, open minded, flexible, honest thinking in evaluation, honest in facing personal bias, wise in making judgments, willing to make judgments, orderly in complicated matters, diligently looking for relevant information, making sense in the selection of criteria, focusing on investigations, and persistent in finding results that are as exact as the subject and circumstances of the investigation permit (Ramasundaram et al., 2005)

Critical Spatial Thought is habituated action built on constructivist cycles of knowledge production, application, interpretation, assessment, and reproduction can be driven by intellectual commitment to regularly use thinking skills to guide behavior (Riordan & Klein, 2010). Spatial thinking is the ability to visualize and interpret location, position, distance, direction, relationships, movements, and changes through space and from time to time (Solem & Foote, 2009).

Although scale and environment vary, in each situation cognitive spatial thinking processes rely on our capacity to understand visually and distinguish factors, such as location or position of phenomena and distance, direction, angle, and orientation about how all together in their respective contexts. Factors like this determine how the world is perceived and valued. Combining critical thinking with spatial thinking brings together the principles of these two cognitive approaches to carry out the tasks of reasoning and decision making. Scale, location, distance, and spatial dependence are several factors that will influence the way a person interprets a situation in a critical and informed manner.

1) **Scale**, Scale is very important for spatial thinking. On an environmental or landscape scale, spatial thinking is consistent with geographical thinking, because patterns and processes of the natural and social world are considered. During the spatial thinking process, the scale interacts with location in terms of measuring and describing space. Critical spatial thinking needs to be aware of how scales affect measurement, how scales can limit graph representation, and how computers can store and display location data. Scale has different connotations in geographical and spatial thinking, and all of these meanings influence how an individual reasons with and through space. Scale is used to describe the breadth of the study area. In the process of critical thinking about space, all of these meanings will be understood and applied in the right context. With this knowledge, an individual is ready to understand processes and patterns as they cross scales, such as interpreting hierarchies, networks, and fractals.

2) **Location**, Location is an idea that can be relative and absolute. Critical spatial thinking then involves knowing how certain locations are in countless physical, environmental and social reference frameworks. Location becomes an explanatory variable in a model. Physical, environmental and social data are all interrelated. This truth is a challenge that operates consistently, and it is one that is often violated by individuals who do not think critically about geographical data.

3) Distance, like location, distance has relative and absolute properties, and is a complex idea that is associated with any space consisting of more than one object. Understand the concept of distance and inform critical spatial thinking by providing a means for evaluating expected variables and relationships. This means that matching or harmonizing approaches to measuring distance to a particular situation is the best strategy for making the wisest decisions.

4) Spatial dependence, distance also underlies the basic principles of spatial organizations, everything has something to do with everything else, but generally close objects are more related than distant objects.

Spatial thinking that critically anticipates patterns that depend on space that has relevance and dependence on one another. It helps build comparisons, imagine patterns, and estimate analogues, other spatial thinking practices. Identifying and investigating the dependence of one phenomenon on the nearest variable, generally it will be the practice of critical thinking when they assess and evaluate these interrelated variables.

The benefits of geography literacy for personal life, the world of work and citizens, namely; in our personal lives, making well-reasoned decisions about where to live, how to commute, and what products to buy can save time and money, protect the environment, and improve personal health and welfare (Sinton, 2016). The ability of individuals to demonstrate map reading skills, knowledge of spatial location of places, and understanding of peoples and culture association various regions (As'ari et al., 2019).

Intelligence is defined as the ability to solve complex problems (Angelstam et al., 2013). In each problem solving everyone needs knowledge, interpretation, critical power, and creativity. A smart person will be able to have the ability to understand, interpret and benefit from every event. Geographical intelligence is very important for students to have, considering geography skills are skills needed to conduct investigations, field work, and interpretation of data from the field, use various geographic information technologies, to draw conclusions and communicate their findings.

## Conclusion

The function of the laboratory is to carry out careful and accurate testing and measurement of the phenomenon under study. The types and measurements of parameters vary from one study to another. Different types of measurements and / or measurement of research parameters require different tools. Development of Tasikmalaya's local potential to be used as a laboratory for geography education can be assessed according to learning needs, with indicators of study based on geographic phenomena, namely: study of hydrosphere, lithosphere, anthroposphere, biosphere, and atmosphere. Development of studies can be done in depth based on an analysis of the level of learning needs. The Galunggung Mountain Area can be used as a Laboratory of Physical Geography and Kampung Naga Education Fields as a Social and Cultural Geography Field Laboratory. In its implementation it can be integrated in one field study package. In this case the Geography Education Department applied it in the form of a Field Lecture Practicum based on courses. It is used as an enrichment of the theories that have been given in the classroom.

## References

- As'ari, R., Rohmat, D., Maryani, E., & Ningrum, E. (2019). Management of water resource based on local wisdom: a development study of Kampung Naga as field laboratory of Geography Education in Tasikmalaya, West Java. In IOP Conference Series: Earth and Environmental Science, 243(1), 012002.
- Angelstam, P., Grodzynskyi, M., Andersson, K., Axelsson, R., Elbakidze, M., Khoroshev, A., & Naumov, V. (2013). Measurement, collaborative learning and research for sustainable use of ecosystem services: Landscape concepts and Europe as laboratory. *Ambio*, 42(2), 129-145.
- As'ari, R., & Mulyanie, E. (2019). The use of local landscape as a field laboratory for geography of education. *Jurnal SPATIAL Wahana Komunikasi dan Informasi Geografi*, 19(2), 1-7.
- Achmad, A., Ngakan, P. O., Umar, A., & Asrianny, A. (2012). Identification of Vegetation Cover and Land Physical Potential for Ecotourism Development at the Field Laboratory of Forest Resources Conservation and Forest Ecotourism UNHAS Education. *Jurnal Penelitian*



- Kehutanan Wallacea, 1(2), 87-102.
- As'ari, R., Rohmat, D., Maryani, E., & Ningrum, E. (2019). Management of water resource based on local wisdom: a development study of Kampung Naga as field laboratory of Geography Education in Tasikmalaya, West Java. In IOP Conference Series: Earth and Environmental Science, 243(1), 012002.
- Butzow, B. (2019). Using Sense of Place in the Classroom, (8341), 10-14.
- Carroll, J. B. (1993). Human cognitive abilities: A survey of factor-analytic studies (1). Cambridge University Press.
- Edelson, D. (2009). Geographic literacy in U.S. by 2025. ArcNews Magazine, 38(1), 9.
- Kell, H. J., & Lubinski, D. (2013). Spatial ability: A neglected talent in educational and occupational settings. Roper Review, 35(4), 219-230.
- Metoyer, S., & Bednarz, R. (2017). Spatial thinking assists geographic thinking: Evidence from a study exploring the effects of geospatial technology. Journal of Geography, 116(1), 20-33.
- Monk, J. J., & Alexander, C. S. (1973). Developing skills in a physical geography laboratory. Journal of Geography, 72(7), 18-24.
- Mooradian, N. (2002). Critical Reasoning In Ethics: A Practical Introduction. Teaching Philosophy, 25(1), 91-95.
- Indrayati, A., & Setyaningsih, W. (2017). Revealing the Potential of Rembang Regency as Geotourism and Geography Field Laboratory. Jurnal Geografi: Media Informasi Pengembangan dan Profesi Kegeografian, 14(1), 1-17.
- Peercy, M. M., & Troyan, F. J. (2017). Making transparent the challenges of developing a practice-based pedagogy of teacher education. Teaching and Teacher education, 61, 26-36.
- Poulter, M. (1998). Critical Reasoning: A Practical Introduction. Cogito, 12(3), 227-228.
- Ramasundaram, V., Grunwald, S., Mangeot, A., Comerford, N. B., & Bliss, C. M. (2005). Development of an environmental virtual field laboratory. Computers & Education, 45(1), 21-34.
- Riordan, M., & Klein, E. J. (2010). Environmental education in action: How expeditionary learning schools support classroom teachers in tackling issues of sustainability. Teacher Education Quarterly, 37(4), 119-137.
- Solem, M., & Foote, K. E. (2009). Teaching college geography: A practical guide for graduate students and early career faculty. Pearson Prentice Hall.
- Sinton, D. S. (2016). Critical spatial thinking. International Encyclopedia of Geography: People, the Earth, Environment and Technology: People, the Earth, Environment and Technology, 1-9.