



Coastal Landscape and Land Utility Area in Simpenan Subdistrict, Sukabumi, West Java, Indonesia

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Abstract

Located in west coast of Java, Simpenan Subdistrict at Sukabumi District has variety of coastal landscape. The main objective of this research to identification landform characteristics for landscape and also identify land use using Land Utility Area. This research examines coastal landscape that affected by landforms that consist of relief, landuse, social aspect which is cropping pattern and analyze with the model of Land Utility Area. Spatial and descriptive analysis was carried out in this study by overlay and cross section analysis method. The result of this research indicates that coastal landscape pattern in Simpenan Subdistrict is dominated by mountainous hilly terrain around 60,1% from total area, hilly terrain shape about 30,6% from total area, land use of mixed garden use 30,1% of the area and rice cropping pattern once a year. The coastal landscape pattern is generally still in accordance with the Land Utility Area model but there are some unsuitable located in the second restricted area which is the land use of mixed garden.

Keywords: Coastal Landscape; Landform; Land Use; Land Utility Area; Simpenan Subdistrict.

1. Introduction

Landscapes specifically are the result of the process of climate, geology, geomorphology, soil, hydrology, fauna, land use and other vegetation processes [1]. Landscapes in human geography is the environment resulting from dynamic interaction between man and place [2]. There are four key “domains” of landscape: agricultural production, ecosystem conservation, human livelihoods, and institutional planning and coordination [3].

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This research takes coastal area as its research area because coastal area is transition zone between lands and marine that has variety of characteristics when focusing on terrain-shape and land use [4]. Determination of sustainability coastal lanscape requires land management model that aims land conservation. One of sustainable land management model in Indonesia using the concept of Land Utility Area or in term bahasa Wilayah Tanah Usaha (WTU). Model of Land Utility Area Area was introduced by I Made Sandy in his book about Landuse in Indonesia in 1977 [5]. This model illustrating pattern of landuse for rural areas based on elevation, slope and land. Land Utility Area divided into four classifications; First Restricted Area, First Main Area, Second Main Area, and Second Restricted Area [6]. This Land Utility Area created especially for agiculture. Variety of landscapes can also affect types of agriculture because each region has its own distinck of variety of plants which are suitable for that area and has correlation with land use pattern [7].

Land use pattern refers to the land use. Type of land use such as agriculture in Indonesia can be located in rural areas and coast area. The interesting about land use in Simpenan Sub-district is more than 50% of its land use are forest and the local people livelihood by gardening and farming and most of the local people livelihood by gardening and farming that dispersed from rural area and coastal [8]. The uniqueness of the Coastal Landscape can be seen from the land use pattern [9]. This study aims to examine coastal landscape patterns that are influenced by the physical condition of the environment and its social conditions. In the physical conditions of the environment using landform. On the social factors influenced by the land use and local knowledge of the community about agricultural cropping patterns.

2. Materials and Methods

The landscape can be defined as the material form of a recurring process that addresses the relationship between humans and the environment [10]. Landscape has two important components in the geography of the landscape and cultural landscape [11]. Natural landscape is a visible part of the natural environment such as land morphology, the human component of the landscape is still small and the basis for the formation of cultural landscape. Cultural landscape in question is a concrete appearance of the results of human adaptation to the environment such as land use. The characteristics of this landscape represent how people have a way to live and also show real physical environment. This study links the coastal landscape and model of the Land Utility Area.

Land Utility Area is the territory (land) used by residents or the community as its place of activity (Kartono and his colleagues 1989). Land Utility Area as "Land Management" is created as a model, which is expected to direct the location of something, especially agriculture (with no damage to nature preservation).

The Land Utility Area is a land use pattern for rural areas based on the height and slope of the slope or soil. Land Utility Area will be differentiated into several major usage areas. Slope and altitude are elements that influence Land Utility Area division. Physical factors such as water control and selective function of plants due to temperature. The area of Land Utility Area is 30% of the area is still covered by forests. The Classification of Land Utility Area is divided into 4 in Figure 1.

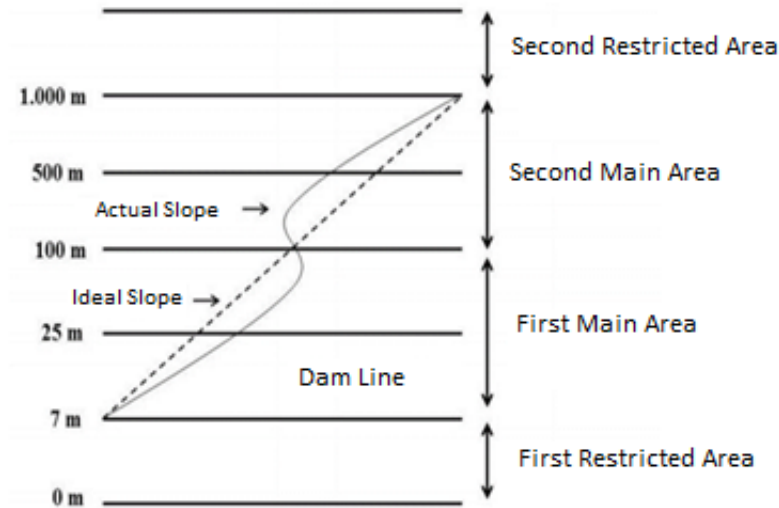


Figure 1: Land Utility Area

This study analyzes the spatial pattern of the Simpenan Sub-district's coastal landscape by using Geographic Information System (GIS). Variables for landscape using physical aspects which terrain-shape, landform, landuse and social condition which is cropping pattern and farming system (figure 2). The unit analysis that used in this study is landuses on every elevation (classification of Land Utility Area). The radius for coastal zone using regulation of coastal boundaries in Indonesia according to the Department of Marine and Fisheries 2002 number 13 that the farthest boundaries for shorelands (coastal zone) is the administrative boundary of village that located near the coast. Distance from coastal villages is determined by measurement in GIS.

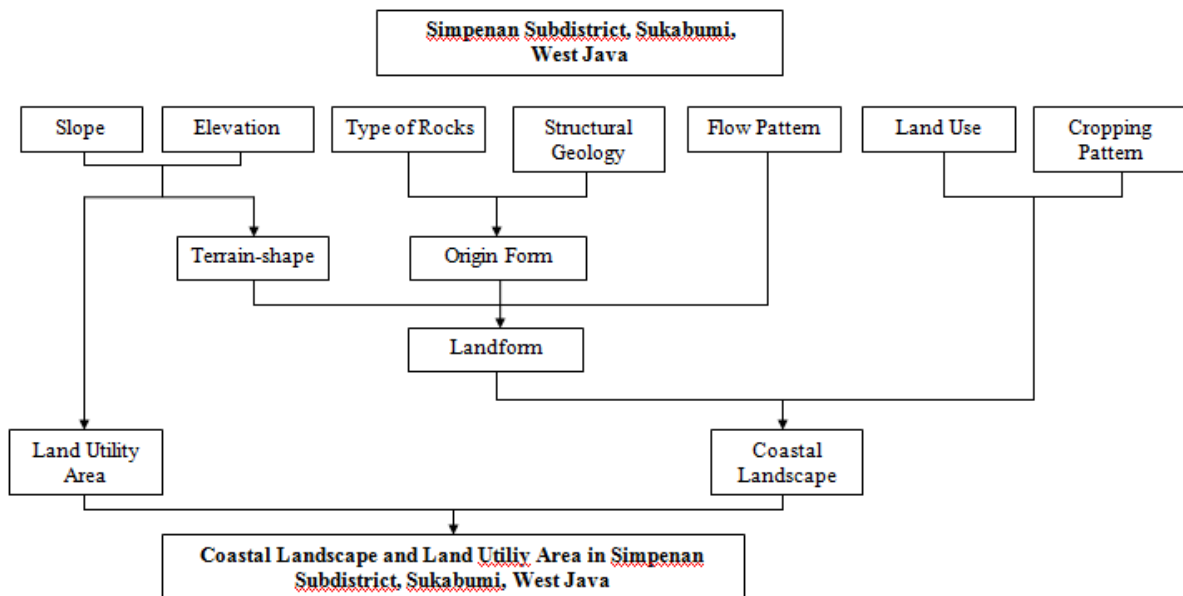


Figure 2: Conceptual framework of coastal landscape sustainability in Simpenan Sub-district

The primary data was collected from interviews with local people or communities that living in Simpenan Sub-

district and working as a farmer or gardener. The interview result interview are close-ended answers with 30 respondents. Sampling method using cluster random sampling. The cluster random sampling is chosen based on the elevation that underlying the physical character of Land Utility Area which has elevation classifications 0-7 asl, 7-100 asl, 100-500 asl, and more than 500 asl (table 1).

Table 1: Classification of Land Utility Area

Number	Classification	Slope	Elevation
1	First Restricted Area	< 2	0-7
2	First Main Area	2-8	7-25
3	First Main Area	8-15	25-100
4	First Main Area	15-25	100-500
5	Second Main Area	25-40	500-1000
6	Second Restricted Area	>40	>1000

Source: Kartono and his colleagues (1989)

Identification Land Utility Area encompassed two phases; (1) create landform map which is derived from terrain-shape, geology, and flow pattern. Geology helps to know the type and the structure of the constituent rock form the land. Landform classification using Verstappen, H. (1983) Landform unit classification (2) verification of land use with observation and participatory land surveys. The database of land use sourced from Geospatial Information Center (BIG) 2013 map and updated with National Defense Agency 2015 land use map. Analyze for this research using Spatial Multi Criteria Analysis (SMCA). This research using spatial analysis aimed to know area that influenced by natural physical characteristics of the environment and surrounding society.

3. Result

3.1. Coastal Landscape

Coastal landscape is a pattern of land use in the pessor area based on the physical aspects of land form and its social aspect that is farming cropping pattern. Figure 2 shows a spatial pattern of coastal landscapes in Kecamatan Simpenan. The coastal landscape of Simpenan sub-district is dominated by the use of garden or plantation land spread over the coastal plains, tectonic hills, volcanic hills and volcanic mountains, especially in the southwest part of Simpenan District. The dominant coastal landscape is the use of forest land in the form of volcanic mountainous land precisely located in the south to southeast of Simpenan District. The uniqueness of the coastal landscape of the Simpenan District is seen not only in the dominant use of forest land and gardens or plantations in the form of volcanic mountain and tectonic hills, but also on the coastal landscape in the type of agricultural land that is irrigated rice field and rainfed rice field.

The cropping pattern on agricultural land use on a steep mountainous terrain land is very diverse and there is also a mixed garden in it that spreads in the northern part of the District of Simpenan. Tropical areas, the use of land is very complex if connected with the terrain-shape.

Furthermore, in this study landscape patterns illustrated from elevation of more than 15 to 250 mdpl are suitable for rice fields such as in the northern coast of the Simpengan Subdistrict and over 250 have entered the forest located in the northern part of the Simpengan Subdistrict.

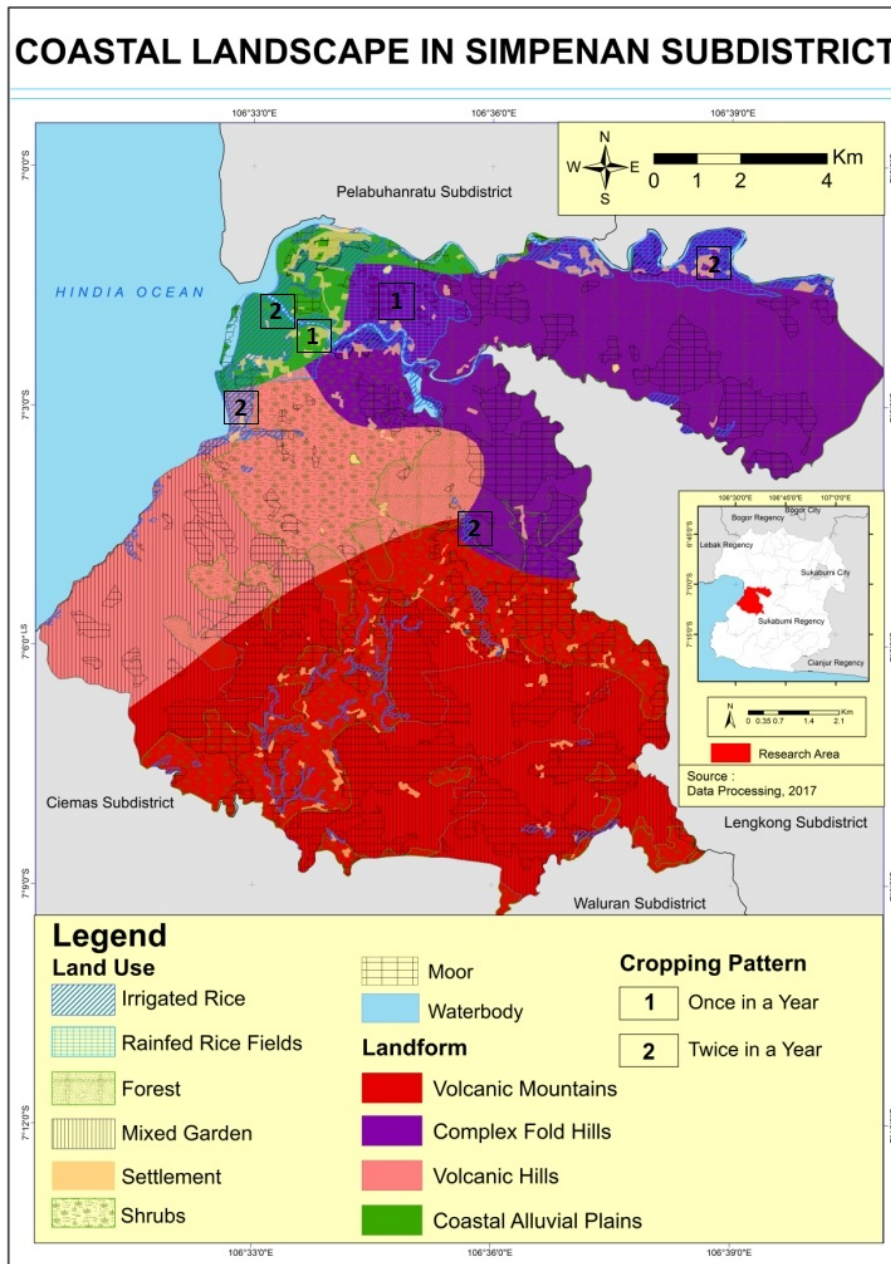


Figure 3: Coastal Landscape and Distribution

3.2. Coastal Landscape and Land Utility Area

The scheme of coastal landscape linkage relationship with the Land Utility Area can be seen in Figure 4. The scheme consists of land use pattern scheme of Simpengan District which represents coastal landscape pattern in the area, terrain and landform scheme also describes the physical landscape in the region research, and the last is the scheme model of the Land Utility Area that describes the ideal conditions of land use.

It can be seen from the four schemes that in general the forms of land concessions in the District of Simpenan are still in accordance with the model of the the Land Utility Area. This is supported by the fact that in First Main Area and Second Main Area that communities only work on their land in certain areas even though there are no customary rules but on the basis of their physical requirements. Despite this, in Second Restricted Area which has a height of 500-1000 mdpl with slopes of more than 40% there are still plantations of tea plantations owned by private parties. Local people only as workers in the tea plantation. In addition to the use of plantation land in Second Restricted Area, there is the use of irrigated land that has two cropping patterns that should not be suitable for cultivation. However, irrigated rice fields located in Cihaur Village precisely the southern part of the Simpenan Subdistrict is terraced.

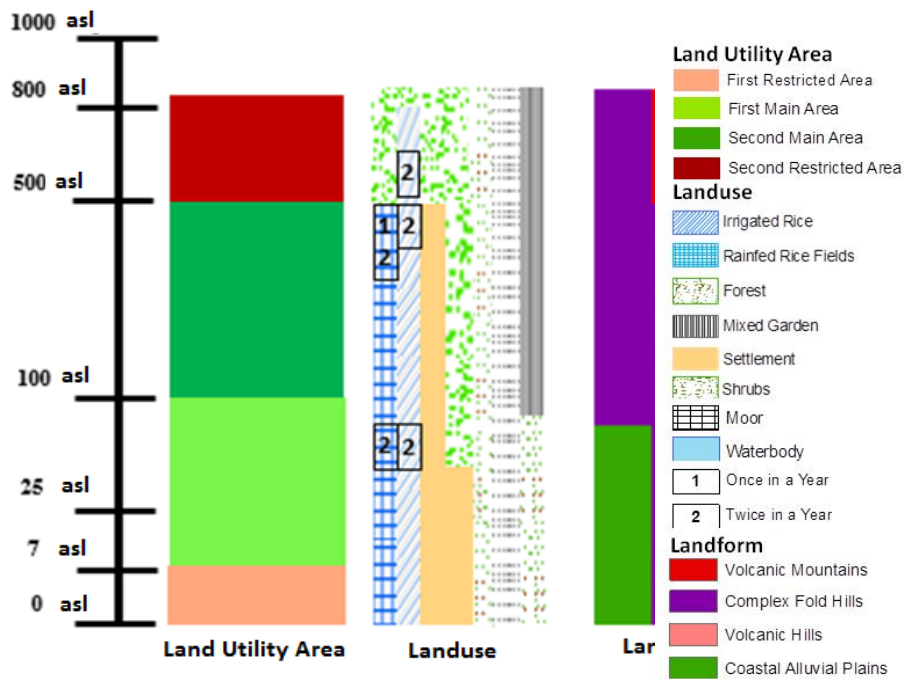


Figure 4: Scheme of Land Utility Area and Coastal Landscape

New understanding in this research on coastal landscape especially in tropical area is adding a concept of agriculture as an important component in landscape-forming. It is related to the purpose of the concept of sustainable landscape either with local scale or global scale. In tropical regions, land use and land management are complex and so is their relationship with terrain itself, so this should have policy on conservation of the land for sustainability landscape.

4. Conclusion

The coastal landscape of the Simpenan District forms a pattern of landforms and varied land uses. The coastal landscape that dominates the research area with volcanic mountain form has a pattern of land use and plantation. Landscape pattern in the form of volcanic mountain land has the use of garden and plantation land with a percentage of area about 42.1% of the total area of research. The coastal landscape has a cropping pattern on irrigated rice cultivation, namely palawija (cassava) and vegetables (chili) located in the western part of the

Simpenan Subdistrict and the northeastern district of Simpenan. The next coastal landscape lies in the form of land coastal plains with irrigated land use and rainfed rice fields that become uniqueness in the District of Simpenan. The form of coastal land that forms alluvial plains of coastal land memiliki irrigation land use patterns and rainfed rice fields with a wide percentage of about 27.9%. Rainfed rice fields, gardens and estates dominate the agricultural activities of the community and have cropping patterns with diverse commodities of palawija (cassava, sweet potato, banana and peanut) and vegetables (oyong and chilli) located on the western to northern and northeastern seaboard Simpenan Subdistrict. Territories that are not in accordance with the coastal landscape pattern that is in the Territory of First Restricted Area and Second Restricted Area. First Restricted Area 1 is located on the coastal landscape of coastal plains with dominant land use are irrigated rice fields and rainfed rice fields. Second Restricted Area lies in the volcanic mountain coastal landscape with land use dominating gardens and plantations.

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