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Implication of classification of land types on the river banks on the layout of settlements planning (A case of the Ogan Ulu community, in South Sumatera, Indonesia)

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ABSTRACT

This article analyses the implications of the knowledge of the Ogan community in South Sumatra (Indonesia) about the types of land on the banks of the river on the layout of their settlements. Living on the river bank is an important identity for the Ogan Ulu community, but the condition of their rivers which tend to run watery and the inappropriate land use, of course, will have an impact on the destruction of settlements and their natural environment. Through anthropological studies, the results of the study show that the use of land on the river banks are not arbitrary, but it is based on how the community interprets the classification of soil types and the river's behaviour in the river environment. This article confirms that the river's behaviour and classification of soil types have implications for the community's struggle to maintain settlements as their identity while preserving the river's environment.

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Introduction

Ogan Ulu is a term for one of the communities that live along the Ogan Ulu river in the western part of South Sumatra province. The habit of settling on the banks of the river has made various spaces (land) on these places utilized and exploited for the benefit of the community. The inappropriate land use, of course, will have an impact on the changes in the structure and the composition of land that will harm the community and its natural environment. This is because the changes in the structure of the land will also influence the composition and exchange of energy and material, soil erosion, which will ultimately influence the sustainability of the socio-economic activities community (Oyedotun, 2019).

The case of the Ogan Ulu community shows that their land-use patterns do not lead to serious river ecological degradation. This is evidenced by archaeological findings which show that the position of the village tends not to change since it was formed (Guillaud, 2006). This is because their land-use patterns are strongly influenced by traditional knowledge systems about the types of land and the river's behaviour that they have inherited for a long time. This shows that in the present context, social changes that occur along with the development of community and economic demands in its life does not necessarily make their land must be exploited.

The ability of the Ogan Ulu community to use their land by following per under with this type of land and river's behaviour is strongly influenced by the hopes of the community to maintain their settlements forever. This is because settlement for the Ogan Ulu community is one of the important identities that must be able to show as part of the community. The significance of this riverbank settlement can be seen from the naming of the community which always uses

the name of the river in their environment (Arifin & Rahman, 2020). Once the importance of living in the banks of the river, making Ogan Ulu community will always strive to maintain their settlement environment from being damaged and still be able to benefit them. One effort to maintain these settlements is to determine and arrange the layout of settlements by following the land-use patterns. This condition is what according to Roberts (1996), making each community always endeavour to keep maintaining their settlements so that they can still survive in life.

This spatial pattern will be found in many communities, as explained by Bowen and Gleeson (2018), where factors such as land use will influence the decisions and actions of individuals and groups who live in these settlements. Omotayo and Musa (1999) in their study show how the land classification greatly influences the pattern of land use itself, which ultimately contributes to the pattern of spatial settlement. The same is also illustrated by Novack and Kux (2010), where the classification of land use also influences the form of informal settlements in the Sao Paulo community, Brazil. The importance of this type of land classification will not only affect how the shape and pattern of a settlement, but in many cases will also affect the agricultural activities of the community (Nabahungu & Visser, 2013; Siahaya et al., 2016; Sirsat et al., 2017; Yodda et al., 2020).

This shows the importance of understanding the existence of a community by reading their knowledge of the classification of the type of land by taking into account the physical space where the position of the land type is located. This is because the settlement patterns and agricultural patterns carried out by a community, not as a single element, but they always have various interpretations by combining the classification of land types with land use according to their cultural practices (Kellogg, 1951). Through this classification

of soil types on the banks of the river, we can also map how the land use-based on the patterns of this soil type and how they relate to the river's behaviour, not only the types of plants that grow on it but also the material and social behaviour of the settlers on it (Terra, 1976). Starting from this point of view, the reading of this classification is expected to provide spatial information with ideal temporal and spatial resolution about why a community utilizes space differently (Omotayo & Musa, 1999), and why ecological changes occur in a particular ecological space (Oyedotun, 2019).

Based on those thoughts, this paper attempts to explain how the survival of the Ogan Ulu community's local knowledge system about the classification of soil types, has helped to preserve the ecosystem of the river environment, while at the same time maintaining the settlement as an important identity for them amidst social change and global demands in their communities. The research questions of this article are: (1) what is the soil types classification on the banks of the river in the local knowledge of the Ogan Ulu community, and (2) what are the implications of the classification for this type of land on the banks of the river on the spatial layout of their settlements as one of the identities should be maintained.

This article is based on three assumptions. First, the settlement is one of the important identities of the Ogan community that is why they always try to maintain the existence of these settlements from generation to generation. Therefore, the loss of settlement means the loss of identity as an Ogan person. Secondly, efforts to maintain settlements mean to maintain the ecosystem of the environment so that they can support the sustainability of their communities. One way to maintain the ecosystem is to control land use by following its designation based on its soil type. Third, the pattern of land use on the river banks is not arbitrary but is based on local knowledge that has been socialized from generation to generation.

Research method

This article is summarized from the results of the author's research conducted in 2018 and 2019 ago in the Ogan Ulu community in the Ogan Komering Ulu district (OKU) of

the South Sumatra province. Administratively, the existence of the Ogan Ulu community is in a large part of the Ogan Komering Ulu district, especially in the northern part of the district. Whereas in the southern part of Ogan Komering Ulu district, it is inhabited by Komering community (see Figure 1). The dominance of the Ogan Ulu community is in four sub-districts in Ogan Komering Ulu district, namely Ulu Ogan, Muara Jaya, Pengandonan, and Semidang Aji districts. Therefore, the information in the form of interviews in this study is more focused on the communities in these 4 sub-districts. Although the focus is more on these four sub-districts, observation sometimes extends to other sub-districts but still in the same district. Expansion of this area (especially observations) was carried out to identify patterns of similarities and differences with the study sites.

Understanding the classification of soil type on the banks of the river in the residential area of the Ogan Ulu community, cannot be separated from the ethnocentric point of view or often also referred to as cognitive anthropology. This perspective starts from the assumption that each community has a unique system for perceiving and organizing material phenomena (Peacock & Thomas Kirsch, 1970; Tyler, 1969). This organizing is done by 'naming objects' that are in their environment and organizing them into broader groupings by classifying and placing objects they face into the same categories (Boster, 2012; Wassmann & Bender, 2015). Based on these ideas, the main source of information is based on the strength of the information provided by the community, by following the views or meanings they provide as supporting the culture (Creswell & Poth, 2018). This means that the interpretation of the actions of the community (indigenous people) must be done by following the patterns of the indigenous people itself (Keane, 2015).

The data collection use depth interviews and observation. In-depth interviews were conducted with several community leaders who live in the research location. This interview is important to explore the knowledge system and the experience of the people in the field research (Taylor et al., 2016). The questions are related to the classification of soil types on river banks and their use patterns in their lives. In-depth interviews were conducted with about 30 informants, most of which were conducted to farmers, as well as community leaders (*tokoh masyarakat*) and formal village

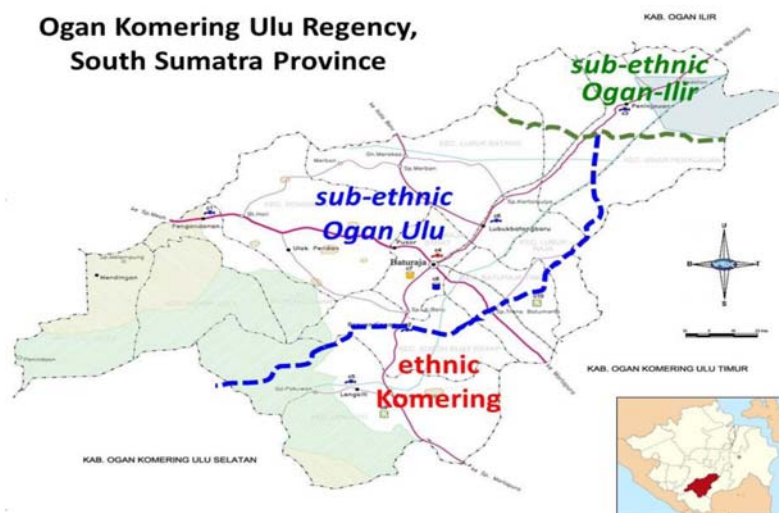


Figure 1. Ogan ethnic area distribution in OKU Regency, South Sumatra Province. Foto modified from <http://loketpeta.pu.go.id>.

leaders (*kepala desa*). Besides that, the writer also conducted interviews (both in-person and by telephone) with several agricultural workers and agricultural service officials in the OKU district. Interviews with farmers are more focused on topics related to why certain lands are in certain areas and why they are used for certain agricultural activities. While interviews with agricultural workers were conducted to explore some agricultural policies that developed land-based farming patterns. The experience of agricultural workers on the various farmers' responses and the difficulties of reform experienced at the site, tried to be analysed and compared with data from interviews with farmers in the field.

This study uses snowball sampling and purposive sampling in selecting informants. Snowball sampling is used to select informants as suggested by other farmers. In this way, the writer can map how the pattern of knowledge of farmers following their culture. While purposive sampling is used to select informants as expected in this study because some informants are considered better and more suitable for explaining certain topics. Purposive sampling is used to select informants from the government such as agricultural workers and government officials. Although deliberately chosen by the author, but asking for input from farmers sometimes also needs to be done.

While observation is used to explore how the peoples' knowledge and experiences are applied in their settlements (Taylor et al., 2016). The initial stage of observation is carried out by identifying the position and land use in each settlement. This was done to map the position of agricultural fields, rice fields, villages, and burials in each village. The observation also identified some land in the settlement that was not used. Through the results of this mapping, deepening of the data is then carried out through interviews to find arguments about why the position of agricultural fields, rice fields, and burials exist in certain areas, and why there was land in the village they did not use. Observations are also made as another way to validate interview data so that the empirical reality of the interview results can be found arguments.

Through this data collection technique, finally obtained a collection of information that can explain reality as expected. Based on the data collected from interviews and observations, a classification is made using interpretation and match to the existing conditions in the field (Creswell & Poth, 2018). Through this data collection technique, finally obtained a collection of information that can explain reality as expected. This collection of data is then analysed using cognitive analysis, to find the cultural arguments behind the information and reality found. For this reason, data analysis is done by finding patterns of interrelation between one reality and another (Miles et al., 2014). The analytical steps taken are, first, mapping the position of land and land use described in the field, secondly, finding cultural arguments related to the spatial structure of their settlements, and finally mapping the cognitive models of the Ogan Ulu community related to spatial and land use they have.

Ogan Ulu: The river bank settlements community

Living on the banks of the river is a common reality that develops in the Ogan Ulu community. This habit is even

carried out when the communities move to another area (*merantau*) (Arifin & Rahman, 2020). This shows that living on the banks of the river has an important meaning for the community, which is evidenced by the naming of their sub-ethnic groups with the name of the main river that flows in their area. The pattern of naming the community by using the name of this river is also commonly found in the Malay community in South Sumatra. Even the naming of government administrative areas will also relatively use the name of the river. This is evidenced by 11 of the 17 districts in the province of South Sumatra; it is taken from the name of the main river that flows in the district.

Ogan Ulu is one of the sub-ethnic groups of Malay who inhabits the customary area in the upper parts of the Ogan river in the western part of South Sumatra province. Historically, the Ogan Ulu community claimed to have come from a group of ethnic groups called the Besemah, one of the ethnic groups which are located in the western part of the South Sumatra province, which was later influenced by the Sultanate of Palembang (Arifin & Rahman, 2020). The influence of the Palembang sultanate was seen in the traditional government system that had been applied known as *merga*, which later gave birth to a new elite in the lives of its society, that is called *pesirah* (clan leaders) and *pembarab* or *krio* (hamlet leader) as a formal leader in the community. Their existence tends to be symbolically marked by the existence of houses that must be different from other people's houses (see Figure 2).

For the Ogan Ulu community, the settlement is one the marker of one's identity. This identity is demonstrated through one's ability to prove where his native village is. How important of the village (settlement) as the identity is, make many Ogan Ulu people, try to maintain the house or land where they live in their native settlement (Arifin & Rahman, 2020). Conceptually, the village (residential land) is one part of the settlement area itself, as explained by Gordon Willey that settlements are 'the landscape on which he lives, which refers to dwellings, to their arrangements and the nature and disposition of other buildings about community life' (Ahimsa-Putra, 1997). Therefore, the pattern of settlements can be defined as the geographical and physiographic relationships of a group contemporary in one culture.

It shows that the settlement does not only include the location of a group of housing as the residence of the settlers, but also includes other aspects related to the grouping such as farming, rice fields, burials, rivers, social groups, activities, and rules made by the settlers at that location. The elements that make up these settlements are never single, but interrelated and influence each other, where the pattern of relationships is always based on the culture of its community (Bowen & Gleeson, 2018; Clout, 1980). Therefore, the pattern of development of a settlement and settlers treat their settlements, are never separated from the cultural aspects of their owners. This thought gives us the point that living on the banks of a river can be seen as an equivalent of the pattern of ideas and cultural behaviour of its people (Ståhlberg & Svanberg, 2017). In other words, a settlement is more a result of the embodiment (expression) of the human conception of space, as well as the results of its efforts to change and utilize the physical environment based on the views and knowledge they have about the environment (Bowen & Gleeson, 2018; Langub & Ishikawa, 2017).



Figure 2. *Pesirah's* house (left side) and resident's house (right side). Foto by Zainal Arifin.

Much evidence also shows that river bank settlements are related to the existence of a river as its communal identity, so it needs to be saved and maintained (Havrelock, 2007; Rice & Urban, 2007). As an identity, the river is also often a source of the mythology of origin (Paine, 2019), forming civilization (Kumar, 2017). This proves that the river becomes the basis of identity in many communities, thus forming a riverine culture community (Desfor & Keil, 2000; Hanafiah, 1995), which needs to be maintained (Ludvik, 2007). Therefore, each community must be able to read and treat the river environment ecosystem to be able to support the existence of the community's life, and this ability is always based on culture (Roberts, 1996). In the case of the Ogan Ulu community, the results of interpreting of this environmental ecosystem, make not all the space (land) in the river environment they will use. There is always a choice of land-use patterns based on the local knowledge of the community, produce a certain settlement spatial patterns.

The settlement as this identity, makes the Ogan Ulu community must be able to read and utilize any existing land by classifying the type of land on the river banks. Through this community read about various soil types, each land will be grouped based on soil quality according to the production of the type of plant to be produced, soil type, soil characteristics, and socioeconomic potential of each soil type itself (Lotspeich & Platts, 1982; Sauer, 1921). Based on this land classification, the settlement development pattern is carried out, by placing each land by the functions and characteristics of the type of land owned and its position on the river bank. That is, each land will be used by the pattern of life they develop and is expected to solve various problems in their lives, both material and socio-political problems (Bowen & Gleeson, 2018).

The Ogan Ulu community is a farming community, with the pattern of agricultural fields as a mainstay, besides wetland farming (rice fields). At the beginning of the development of a settlement, the fields will be the mainstay of the community. To meet the need for rice, at the beginning of the opening of the fields, there is always be carried out by planting rice fields (*Oryza spp.*). These fields are located in hilly areas that are relatively far from the village area, with the main crop being coffee (*Coffea arabica*). After the coffee is well developed, then in between the coffee plants will also be planted with various tropical plants, especially fruits such as *durian* (*Durio zibethinus*), *duku* (*Lansium domesticum*), *petai* (*Parkia speciosa*), and *kabau* (*Archidendron bubalinum*). After the settlement of the community began to develop, then rice farming also

began to be opened around the settlement. The existence of rice fields around these settlements eventually makes the field more specifically for coffee plants, while the need for rice is met from the production of rice in each paddy field of community.

For the Ogan Ulu community, rice is not only important as a staple food but is also needed as a social base in each of their ceremonial activities. Therefore, rice produced from each rice field area of the community is not for sale but will always be stored as a supply for every ceremony and other social activities. This is important because rice is a gift that someone will always bring when visiting other people who are doing *sedekahan* (a ceremony to express gratitude to god). The significance of this rice is illustrated by the Ogan Ulu people, through the concept of *malu* (shame).

It's a shame if we go to a neighbor's house who held *sedekahan* without bringing the rice. It will be more embarrassing if we will hold *sedekahan*, but buying the rice from the market. It means that we do not have a good preparation for that ceremony.

Malu in the concept of the Ogan Ulu community is related to the issue of pride so that the absence of rice will be deemed damaging of dignity and honour. Due to the importance of rice as the social basis of the community, the need for rice became the main orientation in the life of the community. Rice as the main purpose in developing the life of the community becomes the measurement to see the wealth of a settlement by the extent to which the community has large rice fields.

Differentiation of the types of plants used for the fields and paddy fields is important for the Ogan Ulu community because rice is understood as a type of grass plant that will interfere with soil fertility if planted continuously in the cultivation area. Farmland is considered to be maintained its fertility if it is planted with hard plants so that the existence of plant species such as *durian*, *duku*, *petai*, and *kabau* become ideal plants in each field of the community. Therefore, rice plants are considered more ideal if they are planted on land that tends to be wet which in Ogan Ulu community's knowledge is called *tanah lebak* (wet soil), which is a term to refer to the type of soil that tends to be made wet. Therefore, *lebak* soil also refers to the type of mountain soil that exists in the lowlands, especially those along with the river flow. Knowledge of the function of land like this is what makes the Ogan Ulu community will always try to develop rice fields as a place to grow rice, as the basic needs of the community.

Classification of soil types on river banks in the Ogan Ulu community

Land for the Ogan Ulu community is very vital, therefore the diversity of soil types on river banks will greatly affect the pattern of land use for the development of its settlements. As a farming community, farming patterns are understood to be only one of the agricultural patterns applied, so to support their lives it is also necessary to develop other agricultural patterns such as rice fields and gardens. However, the development of this agricultural pattern is also expected not to disturb land allotment for social (non-agricultural) needs such as settlements and other social infrastructure facilities. This makes each land not ultimately used arbitrarily (arbitrarily), but will go through a planning process and consideration according to the type of land on river banks. The Ogan Ulu community knows that there are five classifications of soil types, namely; *tanah gunung* (mountain soil), *tanah lebak* (wet soil), *tanah kasang* (dry soil), *tanah liat* (clay), and *tanah payau* (brackish soil).

The knowledge system of the Ogan Ulu community believes that there is no type of land that is not useful and cannot be used (*dikde ilok*). That is the reason why the Ogan Ulu community only knows the terms *ilok* land (good soil) and less *ilok* land (less good land). Therefore, land as the main source in life will always be used by its designation pattern, so that the terms *ilok* (good) or less *ilok* (less good) are more related to the accuracy in utilizing the land by its designation. Related to the agricultural patterns, the terms *ilok* (good soil) and less *ilok* (less good soil) soils, are more related to whether or not the type of soil which supports the productivity of the plant species on it. Meanwhile, if related to villages and infrastructure, the *ilok* and less *ilok* land are more related to the suitability of the type of land in supporting the sustainability of the facilities and infrastructure above it.

Mountain land (*tanah gunung*)

Tanah gunung is a term for the type of land that is commonly found in mountainous or hilly areas, which is scientifically known as yellowish-brown podsollic. Some Ogan Ulu communities also often refer to this type of land as *tanah himbe* land in the jungle or land that was once processed into fields, because this type of land is mostly found in the form of jungles. The Ogan Ulu community's knowledge system puts this type of mountain soil as the best type of soil and can be used for various purposes, both for agriculture, settlement areas, and burial areas. However, to support his life, then this type of soil is considered most ideal to be used as fields. The types of plants commonly grown in the fields of the Ogan Ulu community are coffee (*Coffea arabica*).

Therefore, the fields will only be made on the type of mountain soil that tends to move away from the area of the village. This is because the use of the type of mountain land in the village or near the village is considered to be detrimental to the development of the settlement itself because the mountain land that is there or near the village can be used for other purposes. Conversely, utilizing land types of mountain land far from settlements for allotment in addition to fields is also considered to disturb the economic stability of the community, because the fields are the main livelihood for the community.

Wet land (*tanah lebak*)

Tanah lebak is a term to refer to the type of soil that tends to be wet because water is often drained which is scientifically known as latosol. Therefore, this type of *lebak* soil usually exists in low-lying areas, especially those along river basins. This type of *lebak* soil is also often used to refer to the type of mountain soil in the lowlands, which has been converted into paddy fields. Unlike the fields which are positioned slightly away from the village, the rice fields for the Ogan Ulu community must be close to the village. This is related to the pattern of maintaining rice plants in the rice fields, which are considered to require intensive care and continuous care.

As a paddy field area, this type of *lebak* soil is considered ideal if there is a water flow that can enter and inundate the rice fields. Therefore the position of rice fields tends to always be placed on the banks of the river close to the village. The importance of the river as a source of water for the paddy field area, even not all the banks of the river will always be used as rice fields, because the position of the river bends will greatly determine where the paddy fields will be made and developed (see Figure 3). This is related to the function of river bends as a base in making traditional irrigation. The selected river bends are river bends that are upstream in the form of pits so that if the river is flooded, it is considered not to damage the dam created.

The position of rice fields that must be close to villages is related to its function which is also for palawija gardens. This based on the knowledge that land fertility tends to decrease if continuously planted with the same type of plant. Therefore, rice plants which become the main orientation in the paddy field area, are considered to have reduced productivity if the land is not rested or utilized for other types of plants. The solution that was applied by the Ogan Ulu community was resting rice plants for one season, and during this break, the rice fields were planted with crops such as cucumbers (*Cucumis sativus*), string beans (*Viryttin sinensis*) and hundire (*Solanum cerasiforme*).

Dry soil (*tanah kasang*)

Tanah kasang is one type of land that is considered unfavourable if you want to be used as agricultural land because the type of soil is considered infertile. Scientifically, the dry soil is often referred to as litosal. The nature of the soil is less fertile, making this type of *kasang* land tends to be left alone into a thicket (*belukakh*). If the land used to be someone's former field (*ume*), then one way for the land to be useful again is to reforest it into a forest (jungle). The reforestation process is carried out by planting the former fields with plants such as rubber (*Hevea brasiliensis*), or with fruit plants such as durian (*Durio zibethinus*).

Even though the *kasang* type of land is not good for agricultural land, but the Ogan Ulu community's knowledge system, precisely put this type of *kasang* land as a type of land that is ideal for settlement areas. This is because the nature of the type of sandy soil containing pebbles is considered not to make the village slippery and flood if heavy rain is poured. After all, this type of soil is considered capable of absorbing rainwater well. The settlement as an identity for every member of the community, making everyone finally try to own land in the village, known as the *tembokan*. On



Figure 3. Ideal position of rice fields and Ogan Ulu Malay Community Village. Foto modified from <https://www.google.com/maps/place/Pengandonan> (accessed August 13, 2019).

this *tembokan* land, houses will be built as a sign of identity for someone that he is part of the settlement.

Clay (*tanah liat*)

Tanah liat as another category of soil types in the Ogan Ulu community is a term used to refer to one of the poor types of soil, which is scientifically often referred to as grey hydro morph. The nature of the soil is lumpy, slippery, and infertile, making the Ogan Ulu community rarely use this type of clay for village land because it will become a home environment and the settlements will become muddy and prone to flooding when it is poured by rainwater. This clay is also rarely used for agricultural land because it is considered a waste of work. After all, whatever is planted on this type of land, it tends to produce nothing. Therefore, land with this type of clay will usually be left just like wood (*belukakh*). Nevertheless, this type of clay is considered to be ideal for burial, because of the nature of the land which is easily formed and not prone to landslides.

For the Ogan Ulu community, burial is conceived of as a dirty and unfavourable area, so that its existence should not interfere with the development of the settlement itself.

Related to the concept of direction, the direction to the burial area (dirty and unkind area) is often referred to as the *close* direction (*dekheat*), while the direction to the river is considered to be the right direction. Therefore, burials will be positioned in the edge of the village, also should not be positioned in the direction of the development of the village itself. In the Ogan Ulu Community, the orientation of settlement development is an advanced settlement, which is usually marked by the existence of a traditional market (*kalangan*) owned by its settlement. Therefore, in many cases, the burial area is finally placed far from the settlement, and if it is near the settlement it will be positioned along the edge of each settlement, which is considered not the direction of settlement development (see Figure 4).

Brackish / watery soil (*tanah payau*)

Tanah payau as another type of poor land for a type of soil is always inundated by water because of the spring of water source flows and inundates the land. The Ogan Ulu community also distinguishes this type of brackish soil from marshland, where marsh soils tend to always be runny with high acidity, while brackish soils are always flooded with water

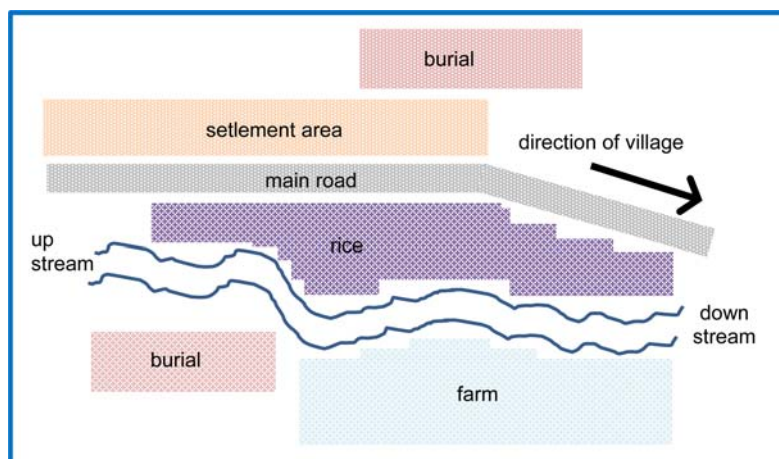


Figure 4. Position of burial areas in the Ogan Ulu Community.

but their acidity is not as high as marshlands. The nature of the land which is always inundated also often used by the Ogan Ulu community to refer to the area behind the house which is always inundated due to family wastewater discharge continuously, thus forming a puddle (dirty water puddles).

The nature of the soil which is always inundated with water makes the land with this type is rarely used for areas of cultivation and settlements, and even considered less ideal for rice fields. This is because an area of cultivation will only use areas on dry land. Meanwhile, if it is used as a rice field area it is also considered less than ideal, because the rice fields for the Ogan Ulu community, will also be used for the area of palawija which requires dry land. Therefore, land with this type of brackish land tends not to be used. Unlike the type of brackish soil as a pool of water due to the disposal of family liquid waste, this type of soil can be turned into *tembokan* by flowing the liquid waste into the nearest ditch, until the area becomes dry. However, this alternative is only done if someone needs *tembokan* to build a house, while the area with other types of land they do not have.

Classification of soil types: resilience and alternative changes

Most of the land owned by the Ogan Ulu Community is in the type of mountain land, so not all settlements will have all kinds of land as they understand it from previous generations. Conversely, even though they have the ideal type of land that they will use, other considerations tend to influence the decision whether to use or not. This makes the system of the pattern of land use in the Ogan Ulu community not always follow the ideal soil type classification pattern. This shows that the pattern of land use patterns will always have various choices with certain considerations. Some important considerations that will always follow the application of knowledge about land use are; (1) Settlements are the important identities that they must maintain for generations. (2) River flow is a central part of developing settlements, so the use of soil types will always be adjusted to their knowledge of the river flow patterns behaviour.

Settlement as identity

For the Ogan Ulu community, the settlement is an identity that will be a marker for someone to distinguish themselves from others. Therefore, the Ogan Ulu community will always strive so that its settlements can be maintained from generation to generation, and try to make their settlements continue to develop for the better. This shows that settlements are not just a grouping of residential houses, but also related to various ecological elements and social-cultural life activities in it (Clout, 1980). the settlement as an arena of social-cultural is what has encouraged people to always use every land they have to remain useful while still being able to maintain the existence of the settlement itself.

One effort to maintain these settlements is to always use every land by the type of land. As a farming community, the land is important to be maintained and will always be oriented to their agricultural areas. However, as a community, the existence of land is also important to build and develop villages and the infrastructure they need. For this reason, the placement of space for agriculture is expected

not to disturb the development of the village. Instead, the placement of space for the development of settlements is also expected not to disturb let alone spend and damage the agricultural land itself. For this reason, in Ogan Ulu community's knowledge, The solution, the fields are always placed outside the settlement area, or away from the village area. While the paddy field area will be placed between the cultivation and settlement area (see Figure 5).

Ideally, paddy fields are placed on land with a type of wet soil that exists along with the river flow. Likewise with the area of the village, ideally placed on the dry land, close to the rice fields. The problem is, in some cases, there are not many types of wet soil found for paddy fields along the river, and sometimes there is also no dry soil near the paddy field. In such a case, paddy fields may use the type of mountain soil on the banks of the river. Likewise, for the village area, it is also permissible to utilize the type of mountain land that is around the rice field area. However, the development of settlement areas may not utilize the type of mountain land that has been designated for paddy fields. Therefore, the land that will be the direction of the development of a settlement, will usually be left empty or used as garden land as an alternative to the development of settlements in the future.

So is the case with the burial area which is ideally placed on land with clay types. However, although in the middle of the village there is clay type land, the land will not be used as a burial area. This is related to the conception of the Ogan Ulu community, which places the burial area as an unsuitable so that its existence cannot be in the middle of the settlement area. Therefore, the cemetery must not be positioned in the direction of the development of a village, because it is believed that it will make the village unable to develop. Therefore, burial is always positioned at the back of the village or in the opposite direction of the direction of settlement development, although it must utilize land with mountain and *kasang* soil types.

River as a settlement central

Ogan Ulu community is a river bank community, so the river has always been central in building a settlement. That is, various environmental elements that are part of a settlement are always placed around the existing river flow. Therefore, land-use patterns will always be adjusted to the knowledge of the community about the behaviour of the river itself. The Ogan River that flows in the Ogan Ulu community is a type of fast-flowing so that the Ogan river tends to erode the river banks, especially when floods come. Therefore, paddy fields and

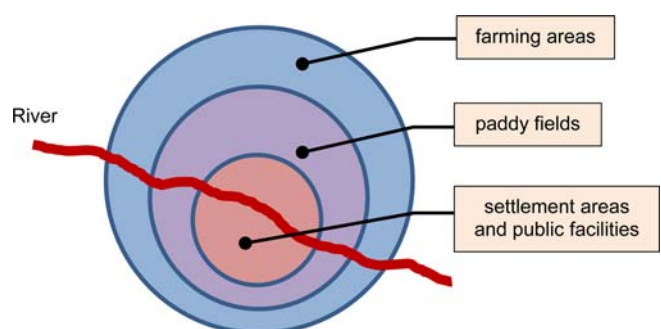


Figure 5. Settlement spatial planning in the Ogan Ulu Community.

villages will be built by knowing or understanding the river's behaviour.

One of the river flow behaviours that is understood by the Ogan Ulu community is the *nyapsap* behaviour, which is the river flow often erodes the bottom of the land, so that sooner or later the land eventually landslides or falls. *Nyapsap* is often found in every bend of the river, so it is considered as a threat to the rice fields and residential areas of the community. By understanding it, the village area will always be positioned at the headwaters of each river bend. However, if the settlement is still positioned in the path of its occurrence, the settlement area will be positioned away from the river bank. Even though river bends are considered dangerous, they are considered ideal as bases for making dams for irrigating their paddy fields. Therefore, paddy fields tend to be positioned downstream at each bend in the river (see Figure 3).

The knowledge about the danger of *nyapsap* makes many Ogan Ulu communities develop villages by moving away from the bend in river flow, although in this area often found dry land, which is ideal for settlements. In such cases, the use of mountain land for paddy fields and settlement areas is permitted. The same thing is treated for burial areas, which will not be placed near curves, even though the surrounding land is a type of clay, which is ideal for burials. For the Ogan Ulu community, burial is very important as a link to the emotional ties of the community with the ancestors, so that breaking down and removing the grave is considered to damage the emotional bond. For this reason, burials tend to be positioned away from the river flow in areas that do not disturb settlement development to the paddy fields and the lea. The understanding of the right position of each eventually makes the area of the cemetery tend to be placed outside the settlement or in the area near the farm, although it must utilize the type of mountain land or dry land.

Classification of soil types on river banks: Its implications for layout settlement

Classification of soil types and understanding of the river's behaviour has made the layout of the settlements of Ogan Ulu community will be patterned in such a way. Although the layout of the settlement seems random, because it does not have the same format between one settlement and another, it has its distinctive pattern. In general, the layout settlement pattern will place the outer space of settlements

is only intended as a farming area, and the more it is to the centre of the settlement, the more diverse land allotment. Paddy fields, for example, are not only used for paddy but also be used for palawija garden areas. Likewise with the settlement area, not only used for building residents' houses, but it must also be used as an area for public facilities, sometimes even it also contains a burial area. There are two patterns found in Ogan Ulu community settlements, namely stump pattern multiple patterns.

The single pattern is a common pattern found in Ogan Ulu community settlements, where the banks of the river will only be occupied by one village. This single pattern, placing the river bank will always be oriented as a rice field area, while the area away from the river flow will be oriented as a farming area. The area of the village tends to stay away from the river flow but must be close to the paddy field area so that the settlement will always be flanked by the paddy field area or between the paddy field area and the cultivation area. This pattern will be found in the lowlands river bank settlements, as anticipation to avoid the erosion of river banks due to *nyapsap* (see Figure 6, pattern 1). However, if one side of the river bank is in an elevated area, the village will be directly positioned parallel to the river bank, and the area across the river will be oriented as paddy field and cultivation area (see Figure 6, pattern 2).

Besides a single pattern, in Ogan Ulu community settlements there are also often found settlements with multiple patterns, where different settlements will be on both sides of the river bank. Settlements with this double pattern, usually a pattern of new settlements formed, as part of the development of old settlements that are opposite. However, in some cases, this pattern of multiple settlements has long been formed, which is a myth is told that a land is a form of division from two ancestors (*puyang*) who are brothers, as it is told by a traditional leader:

The villagers who live across from us are our relative (*bedunsanak*), because their ancestor (*puyang*) is our female great-grandmother's brother (*muanai*). He opened the field, and then his descendants decided to live in that area

Settlements with this double pattern, placing each side of the river bank will be controlled and utilized by each different settler community. Like single pattern settlements, in these dual pattern settlements, river bank areas will always be oriented to paddy fields, while areas that move away from river banks will be oriented for farming areas. This double pattern, finally created two patterns of settlement symmetrically, where the outer space is a farm, and the

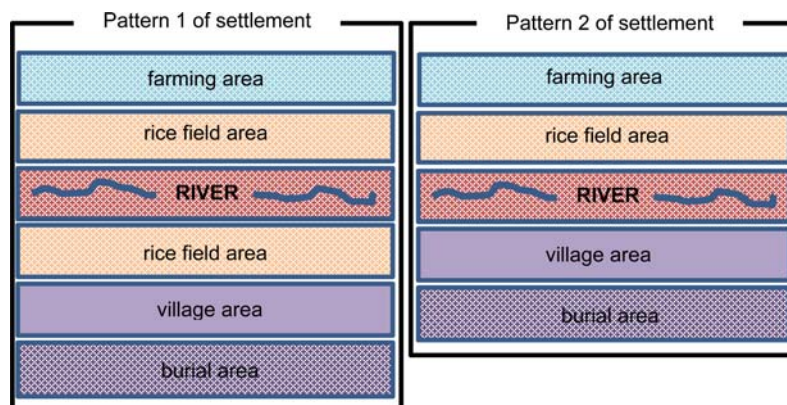


Figure 6. Single pattern settlement spatial layout in the Ogan Ulu Community.

inner space (river bank) is the rice field area. The residential area will be in the middle of rice fields and the cultivations itself. Although this symmetrical pattern is a common pattern found in multiple pattern settlements, in some cases, sometimes it is also found that the settlement layout is almost similar to a single pattern of spatial settlement, where the paddy fields and farms are surrounded by their settlements.

The spatial pattern that places the river at the centre of the settlement has implications for the location and design of houses in the village area. In general, the composition of houses will be made parallel with the flow of the river, so that the settlement pattern looks elongated along with the river flow. But it will also be found (though not a general pattern), where villages are formed vertically (crossed with river flow). This vertical pattern village will usually be found in settlements with multiple patterns, where the development of settlements is only possible towards the river. The Ogan Ulu community village pattern always puts the descendants of the founding houses of the village in a line that is close to the river flow. The descendants' houses of the village founders are positioned back to the river and will be the main reference in building the next houses.

Parallel with the line of descendants founder's houses of this village, there are various infrastructure facilities to support the village established, such as mosques (religious facilities), meeting facilities (*balai*), and security guard (*poskamling*). At the front of the house of the founder of this village, there is always a facility of a public road built, so that the next plan of houses would be followed on the side of the road. This finally makes public roads become a centre in every village, and every house will always be faced with these public roads. In villages that are relatively starting to develop and are densely populated, the arrangements of the houses in the villages will consist of several rows where houses will be made with one back to the other. The arrangement of these back-to-back houses is related to the position of the *tundan* (family wastewater disposal site) that is behind each house. Therefore, by turning away from each other, each front of the house will avoid the family's liquid waste.

Conclusions and recommendations

For the Ogan Ulu community, settlements are one of the identities that they need to maintain for generations. Therefore, each land will be used functionally based on the type of soil and the river's behaviour they know. Understanding the river's behaviour is considered important because the river in the Ogan Ulu community is a type of watery river so that it is considered to be endangering the sustainability of the settlement itself if it is not handled properly.

In closing, the findings of this study indicate several recommendations that explain the importance of understanding the classification of soil types and river behaviour. First, living on the banks of a river is not an arbitrary decision, but is a form of careful planning of the results of the community's knowledge about the river's ecology with all its potential. With this result, not all land with the ideal type of soil on river banks will be used according to its function. There will always be alternative patterns of land use utilization according to their knowledge of the river's behaviour. The implication is that the Ogan Ulu community can maintain their settlements, while at the same time being

able to adapt to the changes and interventions that continue to infiltrate their lives.

Second, the case of the Ogan Ulu community also shows that river ecology will not only be understood functionally, but it will also carry cultural significance. Starting from this study, the understanding of river ecology, especially the classification system of soil types that exist in watersheds, can be an appropriate medium for understanding the identity and survival of a community in a particular region. This is because river ecology not only has implications for agricultural patterns for developing a region but also has cultural implications that create certain social grouping patterns.

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