Local Knowledge About The Structure, Function And Conversion Of Landscape In The Karangwangi Village, Cianjur, West Java, Indonesia

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Abstract. Karangwangi people is one of indigenous people in West Java who has local knowledge about their nature thoroughly. They have local tradition about landscape ecosystem arrangement that based on *sakral* (sacred) norm. With this rule, local people will always try to preserve the sustainability of their natural environment. However, modernization, increasing population, decreasing forest, and increasing market economic penetration, causing this rule and structure of landscape in Karangwangi village has changed. Land conversion in Karangwangi was occur because of settlement and land investment by people outside the village. These behavior changes in tradition and landscape (structure, function and conversion) in Karangwangi may impact on their daily activities, and so do the changes in daily activities can change their behavior in tradition and landscape. This research was undertaken in the Village of Karangwangi, Sub-district of Cidaun, District of Cianjur, Province of West Java, Indonesia. This paper aims to identify how indigenous people in Karangwangi understand kinds of landscape and another conversion that was happen as a result of management. The method used in this paper is qualitative with ethno ecological approach. The resulted of the study show that local people in Karangwangi Village understand how chronological of landscape structure, function and conversion.

1. Introduction

Indonesia is one of country that has various indigenous people with various special characteristics. Every indigenous people has different way of social life, economic, culture and all of it is depend on the ecosystem where they live (Waluyo 2008). This dependence creates an interaction system between social and biophysics (Marten 2001). Naturally, human always take the benefit out of nature for granted, especially things for construction materials, water, food, medicine, and handicraft that they are sourced from nature (Sastrapranaja et al. 1979). This causes the social life, culture, economic, technology and politic to grow and develop in every ethnic that eventually influenced their perspective to manage the environment. Such knowledge discover the value of culture ideas in social system (Suparlan 1980; Ramdhan et al. 2015). Interaction between indigenous people and their environment is part of ethno ecology.

Karangwangi people is one of indigenous people in West Java who has local knowledge about their nature thoroughly. They are using Bahasa Sunda as local language in their daily activities and has many local traditions like such traditional ceremony for planting and harvesting of paddy (Iskandar et al. 2016). One of their local tradition in Karangwangi is landscape ecosystem arrangement that based on *sakral* (sacred) norm. With this rule, local people will always try to preserve the sustainability of their natural environment. However, modernization, increasing population, decreasing forest, and increasing market economic penetration, causing this rule and structure of landscape in Karangwangi village has changed. Land conversion in Karangwangi was occur because of settlement and land investment by people outside the village. These behavior changes in tradition and landscape (structure,
function and conversion) in Karangwangi may impact on their daily activities, and so do the changes in daily activities can change their behavior in tradition and landscape. This paper aims to identify how indigenous people in Karangwangi understand kinds of landscape and another conversion that was happen as a result of management by using ethno ecology approach.

2. Materials and Methods

This research was undertaken in the Village of Karangwangi (desa), Sub-district (kecamatan) of Cidaun, District (kabupaten) of Cianjur, Province (provinsi) of West Java, Indonesia. Geographically, this village is located at approximately latitude 7°25' - 7°30' S and longitude 107°23' -107°25' E. Administratively, Karangwangi Village was expanded by Cidamar Village which area about 2.300,17 hectares. Topographically, Karangwangi Village consist of moderate to very steep slope hills, and at altitude between 200-275 m above sea level (asl). This village is passed by two rivers, they are Cikawung River and Cisela River. The Karangwangi Village is west bordering to Cidamar Village, north to Cimargang Village, east to Garut District and south by the Indonesian Ocean (Figure 1). In 2015, there are 5,587 people inhabited in this village with 1,817 households (Iskandar and Iskandar 2016).

The method used in this paper is qualitative with ethno ecological approach. The writer want to understand the local knowledge about various type of landscape such as structure, function and its changes within people in Karangwangi Village until now. The collecting data technique in the field was done by conducting in-depth interview with local people and literature study. The data was analyzed in descriptive.

3. Results and Discussions

Modernization, population growth, decreasing forest, and increasing market economic penetration, were phenomenon that occur in Karangwangi, which impact in the changes of structure and landscape function from time to time. Based on in-depth interview which was conducted together with local people in Karangwangi, landscape dynamic was known starts from forest (leuweung), swidden field (huma), garden (kebon), rice field (sawah), and homegarden (pekarangan).

3.1 Structural and functional shifting from forest landscape (leuweung) into swidden field (huma)

In the ancient time, West Java area was dominated by forest. The people is rely on it to fulfill their necessity. One of the methods to harness the forest is with farming. Local people called the forest with
leuweng. In 1950s and 1960s, Karangwangi people was usually plant paddy in the forest by nomad. It is because the forest condition was still huge and widespread and the population was still low. This method was called ngahuma. Each household, was permitted to open the forest as huma every year within 0, 5 – 1 ha areas.

The secondary forest which was called jami is a huma which had just left behind or fallowed less than one year and still had paddy residual straw on it. Jami which was fallowed more than one year will become secondary forest and be called as reuma. The secondary forest which fulfill by bushes was called rungkun, ruyuk or dungus and if the field has ‘old enough’, which was characterized by underbrush, can be used as huma once again.

Usually huma was planted with variety of local paddy (Oryza sativa L), such as pare sintung and pare jampong. The paddy which was harvested from huma was not allowed to be sold into the market and must be stored at paddy barn (leuit) in bundles (gedengan pare). Besides paddy, there were poly culture system in huma such as suuk (Arachis hypogaea L), sampeu (Manihot esculenta Crantz), cengek (Capsicum frutescens L), wijen (Sesamum indicum L), hiris (Cajanus cajan (L) Huth), turubuk (Saccharum edule Hassk), and hajeli (Coix lacryma-jobi L) plants. These kind of plants depend on the farmers’ diligence, the more diligent the farmer, the more diverse the huma would become. Unlike the paddy, these plants may allowed to be sold into the market.

However, population growth and modernization in Karangwangi Village are causing decreasing forest area. Eventually it also the reason of the decreasing of huma system in Karangwangi. Nowadays, huma system can only be found in special places such as tegalan field or kebon kai. Paddy barns was no longer used by people, because farmers are not harvesting their paddy in a bunch anymore, they are collecting the paddy in sacks. Paddy seed which is planted in the field are superior seeds with 100 days age. The planting time usually occur on October or December, and harvested on February and March. After paddy was planted, huma field usually was planted again with soya bean (Glycine max (L) Merill), kacang susuk, etc. Nowadays, rice field system is more advance in Karangwangi Village than huma system.

3.2 Structural and functional shifting from swidden field landscape (huma) into rice field (sawah)

The presence of rice field (sawah) system was developed a little late for Karangwangi people compared to swidden field (huma) system which was firstly applied. The change of huma system to sawah system applied by repaired and build an irrigation system for their farm. In the beginning, Karangwangi people who switch to sawah system was few in number. Based on information from interviewee, sawah system even seldom found in the high income farmer. It was because expense to pay the laborer when it needed to made new field with sawah system is too expensive. There is no significant difference between management of sawah system and huma system because the farmer used the same organic farming system by using various kinds of local paddy and fertilizers from livestock manure and organic waste. The distant of planting and harvesting was still the same, once a year. And the distant between harvesting and planting was use to aquaculture and cultivating genjer (Limnocharis flava (L.) Buchenau) or just fallow it.

The significant change was happen to Karangwangi farmer in early 1970s when the green revolution and the five farming programs (panca usaha tani) were introduced. The impact of these programs was ‘similarity’ in farming industry. The panca usaha tani program are involved in the rice intensification such as : (1) use of modern varieties paddy, such as IR, PB, and other genetically engineered seeds from laboratory; (2) use of chemical fertilizer, like urea, TSP, etc.; (3) improvement in land preparation (using pesticide); (4) improvement in irrigation; and (5) improvement in crop maintenance. Another significant change of this program can be seen in the method of farmer in Karangwangi Village. Usually they were using local paddy seeds for their rice filed, then it was changed into modern varieties seed. Moreover, after green revolution, pesticide often found in the farming process by Karangwangi people more often. The planting cycles was changed as well, where originally planting was conducted once a year, now it has become multiple time in a year, depend on sawah location and water supply. Originally in rendeng season (planting season) was occur on
November or December and harvesting season occur within the next three months. The second planting cycle was done on March or April and harvesting on August. This planting will continue only if the sawah location is near to the water sources. Meanwhile for sawah which located far from water source and was not obtain enough irrigation, farmers will use the field for planting palawija like maize or fallow it until the next season

3.3 Structural and functional shifting from swidden field (huma) landscape into garden (kebon)

In 1990s, varieties of local paddy was rarely planted in huma because of the long harvesting time which was around 4-5 months. So that, local people was changed with new varieties of paddy which harvesting after 100 days planted. For increasing the income, at the same time people was planted beans and chili. The huma was left behind will be open field which it is called tegalan. If rainy season come, tegal will planted with various seasonal crops which it is called kebon.

In 2000s, Department of Forestry was issued a policy such reforestation in former field of huma. Some of timber plants were introduced by Department of Forestry such as albizia/eng gig (Paraserianthes falcata) (L) 1 Nielsen, jabol (Anillocephalos candaba), and mahogany (Swietenia mahagoni) (L) Jacq. Then, it made people often to plant albizia in tegalan which was usually called with kebon albasiah/jengjeng. Similarly in the field which was planted with bamboo (awi) it was called kebon awi. And then, kebon kai which was planted by sugar palm (Arenga pinnata) (Wumb) Merr), coconut (Cocos nucifera L), peuteuy (Parkia speciosa Hassk) and mangos (Mangifera indica) L. In the past, the function of field area with various timber plants and seasonal plant, fruits which were used for full fill the long term necessity it was called talan. But, this name was not familiar for young generation and they rather know kebon kai, kebon awi, kebon albasiah.

Nowadays, majority status of tegalan or kebon in Karangwangi have turned into land owned due to implementation of fallow certification by Karangwangi Village policy in 2013. But, there are still some fallow field that has not been certified which are far from settlements, it called taneuh bodas or taneuh pangangonan. Based on history, that field was buffalo grazing land (pangangonan), while in 1985/1986 buffalo was not be cared anymore by local people because there are plow machine as the substitute. Now, when rainy season in November, these fallow land more planted with seasonal crops like suuk (Arachis hypogaea) (L), maize (Zea mays) L, bonteng (Cucumis sativus) L, kacang panjang (Vigna cylindrica) (L) Skeel), waluh (Cucurbita moschata) (Duch) Poir), and sesame (Sesamum orientale) L. Whereas for second times crops (morekat), these kebon were planted by kacang hejo (Vigna radiata), suuk and sesame. The fertilizer was used for kebon is inorganic fertilizer are urea, NPK (nitrogen, phosphor, kalium) and pesticide to eradicate pests. Furthermore, kebon kai was planted albizia timber in monoculture and tumpangsari with mahogany, or mixed with seasonal crops like cardamom (Elettaria cardmomum) Maton) and beans. For indigenous people in Karangwangi Village, albizia has economic value which can be sold and used for fulfilling daily needed such as construction material, kosen, table material, chair, etc.

3.4 Structural and functional shifting from garden (kebon) landscape into home garden (buruan)

Karangwangi’ villager refer the land across their house which they are using to plant palawija as buruan. Inside buruan, we can find various plants such as peuteuy selong (Leucaena leucocephala), peuteuy (Parkia speciosa Hassk), guava (Psidium guajava) L), sapodilla (Manilkara achrass (Mill) Fosberg), mangos (Mangifera indica) L, citrus (Citrus aurantiifolia) (Christin and Panz), jeruk purut (Citrus hystrix) Dc), pineapple (Ananas comosus) (L) Merr), coconut (Cocos nucifera) L), cassava (Manihot esculenta) Crantz), sawawung (Occinum basilicum) L), cardamom (Elettaria cardmomum) Maton), galangal (Languas galanga), ginger (Zingiber officinale) Roxb), cengek (Capiscum frutescens) L), turmeric (Curcuma domestica) Val), dan lemongrass (Cymbopogon citratus). 

Buruan also known for its high in plants variation (cultivar). For example at least there are 12 variations of banana that can be found in buruan such as cau kapas, cau kosta, cau nangka, cau raja bulu, cau sabajimlik/jibeuh, cau ambon, cau angkeng, cau galek, cau raja cer, cau beureumgember, cau kapok and cau mali. Not only bananas, the coconut also has its own variations including kalapa.
puyuh, kalapa gading, kalapa beureum/merah, dan kalapa hejo. Home garden system in Karangwangi is not just about plants, it’s also includes variety of livestock such as chicken and lamb. Chickens that lives in home garden also varies in Karangwangi, we can find several type of chicken such as ayam lisung, ayam tukung, ayam kate dan ayam aduan. Karangwangis’ villager used to domesticate those animals inside cages near their houses. However, sometimes chickens and lamb are set free by its owner to find its own food.

Karangwangis’ local people is never using pesticide for plants on their home garden. They choose animal waste as their source for fertilizer for their plants. This is because home garden system doesn’t require much attention as intensive as sawah system. Moreover, it is because home garden system is barely attack by pests. Karangwangis’ villager gets a huge benefits from their home garden, such as from fruits, spices, herbal medicine, plants for traditional ceremonies, household materials, and firewood that they are planted. Fruits that can be found in home garden system are bananas and sapodilla. Clove, cikur, ginger, citrus, surawung, galangal and lemon grass are spices that usually can be found in home garden system. We also can find several herbal medicine from this place, for example kibeling (Sericocalyx crispus (L) Bremek), ginger (Zingiber officinale Roxcoe), galangal (Alpina galanga (L) Willd), panglay (Zingiber cassumunar Roxb) and citrus (Citrus aurantifolia) (Christin and Panz). Some plants from home garden are also used for ritual or traditional ceremony such as roses (Rosa hybrida Hort), betel (Piper betel L), areca nut (Areca catechu L), coconut (Cocos nucifera L) and banana (Musa paradisiaca L).

There is no specific time for harvesting those fruits or plants in home garden-system. It is because all of those plants have different flowering and different season to grow its flower and fruits. Some plants such as lalab, spices and some fruits such as papaya can be found every time whole year.

3.5 Discussions

Culture and landscape are always closely related, it is because every changes in landscape is happened because there is changes in culture of mankind. That mankind has a significant role in shaping pattern of nature and landscape process (Dewi 2009). Landscape changes also occur in Karangwangi Village, some of the reasons are modernization, population increase, rapid economic growth, and also the forest which become lesser every day. Karangwangis’ Villager are able to identify and differentiate types of landscape. The ability to differentiate types of landscape is based on several indicators which is based on function, characteristic and also ownership. Moreover Karangwangis’ Villager are also capable to explain the chronological order of landscape shifting from forest landscape into huma (partial), huma landscape into rice field landscape, huma landscape into garden landscape and garden landscape into home garden landscape (Figure 2).

Landscape shifting from forest into huma had happened since ancient time up until 18th century, especially in West Java. People in South Banten and South Priangan area chose to become farmer/peladang (ngahuma) for living (Terra 1958; Iskandar 2009). Such shifting also occurred in Karangwangis’ Village because of its people found benefits from the forest. By having farm in the forest they got natural nutrient from the forest to grow their crops. Huma system is considered as a better system for ecology because it integrated into general structure of the forest. If it can’t adapt so it will return (Geertz 1963). We can see it also happened in transformation from huma into jami, and becomes reuma and transform into rungkun/rayik/dangus and eventually that’s all transform into huma again.

According to Pranowo (1985) there are two factors which affecting the amount of time to process huma: type of the forest and population. Primary and secondary forest have different amount of time to be processed into huma. Primary forest takes 2-4 years before it can be used as huma. Meanwhile, secondary forest takes less than 2 years. This process is caused by different amount contents of natural fertilizer in side those land forest. Primary forest contains more natural fertilizer than the one found in secondary fertilizer. Population density also affects the amount of time to process the land. The more population an area has, the more time it takes to process the land, and vice versa. It happens because
the opportunity to open a new forest is becoming small. Eventually it affects the amount of *huma* in Karangwangi’s Village and later transformed into rice field.

If we compared rice field with *huma*, rice field produces more rice because its’ high frequency in planting and harvesting throughout the year (up to 3 times a year). Rice field is well known to be stable and durable, it can produce the amount of rice that never decrease in terms of harvesting (Gertz 1963). Besides the transformation from landscape into rice field/sawah, there is also cultural transformation/ shifts in Karangwangi. People in Karangwangi usually held a ritual every planting season in order to get the blessing. There are some items that people use for offering (*sesuguhan*) in that ritual such as green coconut (*Cocos nucifera* L), basil sleaf (*Ocimum basilicum* L), and tobacco (*Nicotiana tabacum* L). The *huma* ceremony usually in *pupuhan*, a sakral place (sacred) which is bordered with *hanjuang* (*Cordyline fruticosa* (L) A.Chev.), a place for paddy planting (*ngaseuk*). The day and direction for *ngaseuk* start from *pupuhan* direction that usually determined by calculation of *naptu tempat* and *naptu hari* which was considered bring lucky.

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**Figure 2.** The Structure, Functions and Conversion Landscape in Karangwangi Village, Cianjur, West Java, Indonesia (was modified from Iskandar et al. 2016)
The entry of modernization such intensive agriculture which is supported by the government through the Green Revolution and *panca usaha tani* has worsened soil quality in Karangwangi Village. It is caused monoculture, pesticide and fertilizers which was increasingly used by local people. Now, it is quite dilemma for farmers become dependence on pesticides for pests that continuously come.

Besides being into *sawah*, *huma* also turned into gardens. This was occurred because the garden system adapted form of increasing population and the market economy that is growing rapidly. Consequently, the local people make the selection and introduction of new crops which more profitable economically and perform new inputs such as inorganic fertilizers and pesticides to suit market demand (Iskandar 2009).

The more dense the population, the higher the demand for settlement. This also happened in the Karangwangi Village with new settlements which reduces the area of the garden. To meet its needs, the community has its home garden are planted with a wide variety of crops such as fruits, spices and plants ceremonies and the livestock. This home garden system is not managed intensively and are rarely attacked by pests because of its poly culture. Local people of Karangwangi used to harvest itself the result of home garden for satisfy personal or family needs. The existence of this home garden is very good for the ecology because of it’s still natural without inorganic fertilizers or pesticide and can maintain the diversity of the local plants.

The results of this study provide valuable information that helps us to understand the local knowledge of the landscape of the rural population, especially the local or indigenous people of the Karangwangi Village. Preferably, this local knowledge can be integrated together with western science to improve the economic (economically viable), friendly to the environment (ecologically sound) and socially equitable for rural people (socially justy).

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5. References

[1] Geertz C 1963 *Agriculture involution: The Process of Ecological Change in Indonesia* ed S Supomo (Indonesia: Bhratara Karya Aksara) chapter 2 pp 16-39
[2] Iskandar J 2009 *Ekologi manusia dan pembangunan berkelanjutan* (Bandung: Universitas Padjadjaran) chapter 8 pp 148-153
[3] Iskandar J, Iskandar B S and Pertasmita R 2016 Response to environmental and socio-economic changes in the Karangwangi traditional agroforestry system South Cianjur West Java vol 17 1 (Indonesia: Biodiversitas) pp 332-341
[4] Iskandar J and Iskandar B S 2016 Conf. Etnoekologi dan pengelolaan agroekosistem oleh penduduk desa Karangwangi Kecamatan Cidaun Cianjur Selatan Jawa Barat (Makalah)
[5] Marten G G 2001 *Human ecology: Basic Concept for Sustainable Development* (London: Earthscan Publication Ltd)
[6] Dewi R 2009 *Perencanaan lanskap untuk pengembangan wisata alam di sempadan Sungai Kemiri Kecamatan Margadana-Kota Tegal* (Thesis)
[7] Pranowo A P D S 1985 *Manusia dan hutan : Proses Perubahan Ekologi di Lereng Gunung Merapi* (Indonesia : Gadjah Mada University Press) chapter 3 pp 44-46
[8] Ramdhan B, Chikmawati T and Waluyo E B 2015 *Perspektif kultural pengelolaan lingkungan pada masyarakat pada masyarakat adat Cikondang Kabupaten Bandung Jawa Barat* vol 1 1 (Indonesia: Sumberdaya Hayati) pp 7-14
[9] Sastrapadja et al 1979 *Tanaman pekarangan* LIPI Bogor
[10] Waluyo E B 2008 *Rev. Research ethnobotany in Indonesia and the future perspective* vol 9 (Indonesia: Biodiversitas) pp 59-63