Adaptation of Sinarresmi traditional village community life towards the environmental sustainability

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Abstract. Halimun-Salak mountain slope area was a place of Sinarresmi traditional village community lives and has a wisdom of environmental utilization. This research is aim to; analyze the form of adaptation in farming pattern and community life pattern. Method that used is descriptive with qualitative approach along with author as the instrument. Community of Kasepuhan Sinarresmi are still holding the value, norm, belief, behavior. To fulfil the needs of community, they did the planting and harvesting only once in a year with the assumption that soil needs to be rest to bring back the fertility and get rid of pest. Rice seeds that used was produced by themselves with planting lifespan of 5 – 6 months. Land cultivating or even harvesting are not using machine and it was forbidden to be traded. Farming was not use chemical fertilizer, because it could kill the flora and fauna which developed in the rice fields. Life pattern of farming and socializing is always conducted with mutual cooperation. This adaptation behavior makes Sinarresmi traditional village community to have a relatively high of food sustainability.

1. Introduction
In order to fulfil the food needs of community, they have to utilize the land. In land utilization of an environment, community needs to consider the environment condition. Although it was for the needs of food materials, but the environmental utilization needs to be maintained, because it would have impact to community. Food availability, one of the key pillars of food security is defined as the supply of food made-up of domestic food production, food imported, food donation and the domestic stock [1]. To fulfil the needs, community did the activity and farming by open the new land and causing a change in ecosystem [2]. To fulfil their needs, human are utilizing land by considering the environment condition. It means that in cultivating land, community must give an attention to the land characteristics. Every activities were adjusted without disrupting the balance. The adjustment of community activities in cultivating land forming a habit which implemented in the form of value, norm, tradition and belief in cultivating land. This form of value are known as local wisdom. Local wisdom was a gratitude of community, so that it would help to decrease a disaster. Local wisdom still well-survived as a gratitude expression, ward off reinforcements, and ward off disaster [3].

Local wisdom that enforced in a community group to take care and protect the sustainability of environment in supporting sustainability of community life. Local wisdom was a cultural product from the past that became way of life. Although it has local value, but that value was regulate a life in an environment [4]. Social adaptation is one of self adaptation in an environment to survive in life [5]. Land cultivating in an environment was not based on the products that obtained from the land, but by protect the sustainability of community life by not exploit the land in an environment. Local wisdom that applicable in community was an adaptation of them towards environment, so the environment
would still sustain and the needs fulfilled. Because if it was conducted a exploitation of land resources, the needs of community could be fulfilled, but in a long-term will causing the decrease of potential. Impact of landuse change in macro is the availability of food was decreased and causing the decrease of food sustainability [6]. Potential decrease causing disturbance to the balance and rising food insecurity because it can not fulfill the needs. These food insecure households could not cover the required daily food from the income generated from their major activity of subsistence agriculture and non-farm activities both in quality and quantity [7].

Development is to develop the economy of community. But community that actives in farming for their economic activities was trough farming activity that related with environment. But the development of farmer economical activities was not balance with the development of population. The increase of production products was not yet means as an increase of life level, if the increase of population was higher than the increase of production level [8]. This means the increase of population are higher compared with the increase of farming products. This increase of needs was triggered by the increase of population with high density. Rapid population growth in many developing countries has raised concerns regarding food security and household welfare [9]. The increase of population causing the need of rice to continuously increased and goes beyond the availability [10]. The increase of population amount along with the decrease of productive farming land caused by land conversion for non-farming sector importance are causing food insecurity [11]. To cope with food insecurity and malnutrition, needs an attempt of increasing rice production [12]. So that the increase of population was not balanced with the increase of farming production, it would causing food insecurity in an area. While the increase of farming production by extend farming land will disturb the balance of environment. The increase of rice production were slow, while the needs is continously increased. This was a wisdom that already applied in community of Kasepuhan Sinarresmi. Rice should not be sold while other products such as banana, cassava, etc can be sold [13].

Sinarresmi traditional village or known as Kasepuhan Sinarresmi is located in slope area of Halimun-Salak mountain and this Kasepuhan included in Sukabumi District. Community of this traditional village is still holding on tightly to the tradition and wisdom that enforced by Customary Leader, because if community wants to be safe from havoc, so they must adapted with environment condition. This area is prone to landslide occurrence, because the factor of landslide occurrence is exists in Sinarresmi traditional village, such as; slope, high rainfall, and the occurrence of slope area utilization for farming land. An intensively landuse change and happened in a long time becomes one of the factor of soil physical characteristic changes [14]. Because of that, community life system in cultivating land was not by exploitation. To fulfil the needs of food, community did the land cultivating that adjusted with nature condition, but the productivity can fulfil the needs of community. This traditional village area is in the area that prone to disaster, landslide is triggered by the activity that related with food crop cultivation patterns/horticuluture especially rice, so that the community of this traditional village in their rice cultivation pattern was adjusted with the environment of land biophysical, economy, and socio-cultural [15]. Food insecurity are happened in globalization era, modernization that occurs in various country including Indonesia, but it was not applicable in Sinarresmi traditional village. Sinarresmi traditional village has their own value and tradition with the assumption to fulfil their life, they must adapted with nature condition, such as; cultivating land and building house.

Because Sinarresmi traditional village has their own value, norm, and tradition, so this research has the aims to (1) analyze the form of adaptation in farming pattern that conducted by community of Sinarresmi traditional village; and (2) analyze the life pattern of Sinarresmi traditional village community in keeping food security.

2. Methods
Method that used related with the observation of socio-cultural of community in answering the aims of this research is descriptive with qualitative approach. This method was used to observe the behavior of community towards the environment. Socio spatial is the formation of space caused by social activities.
occurred in a particular environment [16]. Penyesuaian perilaku ini berkaitan dengan etnografik. Ethnographic designs are qualitative research procedures for describing, analyzing, and interpreting a culture-sharing group’s shared patterns of behavior, beliefs, and language that develop over time [17].

Descriptive method to illustrate the facts of community behavior in cultivating land and socializing to each other. Qualitative approach is by the interview to the community to explore and did a reflection about adaptation of community behavior in cultivating land and life. System of value, norm, tradition, beliefs that implemented in community in their life of Sinarresmi traditional village community. Collected data then analyzed with interpretation process.

Data collecting was obtained by researcher as the instrument with literature study and taking notes by researcher. To obtain data, it was conducted by 3 steps, first is the interview and discussion with customary leader and community of Sirna Resmi village, second is observe and follows the activity of community, and the last is finding the answer of the problems.

3. Results and Discussion

3.1. Kasepuhan Sinarresmi

Kasepuhan is a group of community that still conducted a habit and doing the tradition of their ancestors. This community group were spread around slope area of Halimun-Salak mountain which known as kasepuhan Banten Kidul community. Life of this community is colored with customs, especially the wisdom in respond to the nature and environment sustainability (Kasepuhan Sinarresmi, 2018). Community of Kasepuhan are reffering to the traditional socio-culture behavior and attitude of Sundanese culture of 16th century. Community groups of kasepuhan are spread in Banten and West Java Provinces. In West Java Province, this kasepuhan is spread in Sukabumi District and Bogor. Habit that bequeathed to the next generation in following life pattern in various field especially in cultivating land and system of social life.

Sunda wiwitan is a term of heritage that inherited in the form of value, norm, habit and cultivating farming land. One of community that still tightly did the tradition of sunda wiwitan is kasepuhan Sinarresmi. Traditional village of Kasepuhan Sinarresmi is placed in the southern slope area of Halimun mountain which include Sirna Resmi Village, Cisolok Sub-district, Sukabumi District.

3.2. Farming (Rice field)

To fulfill daily needs, community of this traditional village utilize the land to be cultivated as farming land. Basic needs of this community is rice which comes from paddy. Paddy that planted in dry land or called as huma, while the one that planted in wet land is called rice field. In community of tradition village, rice is a basic crops, and huma is the land for rice crops and it was the obligation of community to keep planting rice in huma. Huma were planted on the slopes alongside the forest. Rice field is wet land which generally planted on the slope of mountain that more slightly sloping than terraced rice fields. Rice which produced to fulfill daily needs as the basic need to eat. Rice of huma or rice fields was planted in the beginning of rainy season around October – November. Because the lifespan of rice is up to 5 – 6 months, so harvesting rice of huma and rice field is conducted in the beginning of dry season which around March – April.

Rice seeds that planted by community by making their own seeds is known as pare gede (big paddy). Type of rice seeds (sp. Oryza sativa L) that planted is typical seed of Kasepuhan that is; cere gelas, kawat, layung, mariley, seghi, wesi. Type of glutinous rice such as; cikur, srimahi, lepo, gantang hideun. Rice planting was started from plowing, leveling the ground (angler), rice planting (tandur), picking up weeds (ngarambet). And every community member are free to determine the type of rice seeds, the important thing is it has to be pare gede seeds. In the time of harvesting (dibuat) were done together and take turns. To cut the paddy is using knife (etem). To transform paddy into the rice is by pounding (nutu). Pounding rice traditionally is conducted after it dried by roasting under the heat of the sun, and then it can be pounded. Machine (heuleur) usage is forbidden, because rice grinding by using machine will remove the skin of rice which called rice bran.
There was flora and fauna that developed in rice field that has been planted. Fauna which developed in watered rice field after plowed until 3 months is eel (sp. *Monopterus albus*), rice field crab (sp. *Parathelphusa convexa*), tutut (sp. *Bellamiya Javanica*), impun (sp. *Minnow*), parar (sp. *barbodes binotatus*), bogo (sp. *Channa striata*), catfish (sp. *Clarias*), beunteur (sp. *Puntius binotatus*), worm (sp. *Lumbricus*), microorganism (sp. *Micro-organizati*). Flora which developed are hyacinth (sp. *Monochoria vaginalis*), genjer (sp. *Limnocharis flava*) and antaman. Those flora and fauna that developed in rice field are taken by farmer as the vegetable and side dishes of daily meal.

Rice planting in the rice field was conducted 1 time in 1 year, and the rest of 6 months can be planting fish or vegetables. This is conducted to keep the soil stability, because the land used for fish or vegetable planting will makes the soil fertile again. Rice planting without using chemical fertilizer like urea, because chemical fertilizer can kill the flora and fauna that usually lives in rice field.

### 3.3. Secondary Crops and Fishery

In the last of rainy season, it was conducted harvesting around April − May, then community plant secondary crops or fishery. Land that was used as rice field is planted by; cayenne pepper (sp. *Capsicum frutescens* L), onion (sp. *Allium ascalonicum*), long beans (sp. *Vigna sinensis*), beans (sp. *Phaseolus vulgaris*), cucumber (sp. *Cucumis sativus*), chyote (sp. *Sechium edule*), eggplant (sp. *Solanum melongena*), tomato (sp. *Solanum lycopersicum*). Annual crops such as, enau (sp. *Arenga pinnata*), coconut (sp. *Cocos nucifera*), banana (sp. *Musa acuminate*), durian (sp. *Durio zibethinus*), mango (sp. *Mangifera indica*), water apple (sp. *Syzygium aqueum*). This vegetables are utilized as side dishes in daily meals, vegetable planting was conducted in the land of *talun*, but it was planted in the house yard or paddy field. Seasonal crops or fishery can be traded except the rice that was forbidden to be traded. Traded of harvesting products of vegetable or fishery was for the importance of daily side dishes or as school funding of their children.

### 3.4. Life Pattern of Traditional Community

Aside from farming, in other life aspects this community of traditional village is always by mutual cooperation. In every harvesting, each family has the obligation to give their rice harvesting product through Custom Leader and stored in *Leuit Gede*. *Leuit Gede* was a place to store the rice and will be used if community is experiencing difficulty or disaster. Land area that cultivated by family are varied. The most narrow land area of a family to be cultivated is around 10 *patok* (1 *patok* = 400 m² or 4,000 cm²) and the largest cultivated area is around 54 *patok* (21,600 m²) with the average of 16 *patok* (6,400 m²). In harvesting time, 1 *patok* produces around 12 *pocong* (bundle, with 1 *pocong* = 7 kg of rice).

From a family that cultivating narrow area with 3 *patok* produces 36 bundle (252 kg) and family that cultivating land of 54 *patok* produces 648 bundle (4,536 kg) with the average of 16 *patok* produces 112 bundle (782 kg). Paddy processing to be rice from 1 bundle (7 kg) become 5 kg of rice. Family with land area of 3 *patok* with harvesting products of 36 bundle produces 180 kg of rice, while they who cultivating land of 54 *patok* produces 648 bundle and produces 3,230 kg of rice and the average of rice field area ownership of 16 *patok* produces 112 bundle and cultivated as rice of 560 kg. Rice that produces from rice field and *huma* are passed to the custom leader, every 40 bundle that passed to custom leader is store in *Leuit Gede*. They are some family in every harvesting time is less than 40 *pocong*, that family was not recommended to give to the custom leader. But in reality, by their own awareness, they still passed the rice to custom leader minimum of 1 bundle of rice.

In fulfil the basic needs of rice, every family was spent 0.6 − 1.1 kg with the average of 1 family spent 0.8 kg, so the needs of food is need rice around 365 days x 0.8 kg = 292 kg. If there are insufficient rice harvesting, that family should involved to the harvesting of other family which have a large land area. Family member that involved to the harvesting of other family will get the rewards of 1 *pocong* rice for every 40 *pocong*. Rice that has been stored in *Leuit Gede* (traditional *leuit*) is used when people experiencing difficulty, famine, havoc or disaster. Characteristic of Sinarresmi traditional village community in cultivating land from plowing, leveling the ground, planting, picking weeds, and
harvesting is always by mutual cooperation. Mutual cooperation makes the work easier and faster, and makes the planting can be done together and take turns. Togetherness in farming or planting simultaneously is to decrease the pests. Therefore, rice that produced by this traditional village community is lasted until 40 years.

3.5. Discussion

Characteristic from house of kasepuhan Sinarresmi is one of characteristic of kasepuhan Banten Kidul community. The form of kasepuhan house should be on stilts, because the location of this kasepuhan is in area of Halimun-Salak. This area was a mountainous area, so it has steep slope – highly steep slope with soil types of latosol and andosol with texture of slightly rough – rough with high rainfall which above 200mm/year. While in the southern there was oceanic plates of Indo-Australia which strikes continental plate of Eurasia. Physical condition are influence the land stability in this area, including kasepuhan Sinarresmi. With this physical condition, becomes a big potential to the disaster occurrence, such as earthquake and landslide.

The form of adaptation in behavior and attitude of kasepuhan Sinarresmi community in cultivating farming land. By planting beliefs that environmental factors form a system, because the environmental factors was also needs to rest. To fulfil the needs of food like rice, community of kasepuhan Sinarresmi are planted the rice in the rice field or huma only once a year. Different planting pattern outside kasepuhan was conducted at 2 – 3 times. Rice planting is only once a year to make the soil be fertile again. Planting of one time in 6 months with beliefs that soil needs to be rest and it will fertile again and get rid of pests especially mouse (Rattus argentiventer). Rice in the rice field or huma did not experienced chemical fertilizer such as, pesticide or urea (chemical material). Fertilization was done by burning straw and turning the soil over, so the straw and the result or burning straw will rot and becomes fertilizer. Chemical fertilizer was not used by kasepuhan community, because urea and pesticide will remove and kill the life in rice field. Flora and fauna that developed becomes side dishes of daily meal of this traditional village community.

Usage of knife (etem) in harvesting time and pounding (nutu) the paddy to be rice. Machine usage in pounding will remove the bran of the rice. Although kasepuhan community did planting and harvesting once a year, but the needs of basic need of rice is always fulfilled. Behavior of mutual cooperation in planting, plowing, picking weeds, and harvesting are shape the traditional community in cultivating narrow land can still be fulfilled. Life pattern of kasepuhan Sinarresmi community makes them to never experience food insecurity and famine. Rice stock that stored in leuit of family and rice that stored in leuit gede (traditional leuit) makes them to have a relatively high food security. After harvesting in rice field and huma, they plant the vegetables or did fishery. Production of vegetable or fishery or other livestock can be traded. The result of traded is to fulfil the needs of meal or family needs. Beside vegetables, fishery, community was also planted other food materials such as; banana, jackfruit, palm sugar, durian, coconut, mango, and water apple that traded in fulfilling the needs.

Prohibition in farming is only once a year, rice can not be traded, building house on stilts, not using machine to cut the rice or pounding, mutual cooperation, take and give with awareness. Although those prohibition has no penalty, it is rare for community to commit violations, if any there would just conducted discussion between kasepuhan community.

4. Conclusion

Farming pattern that conducted by community of Sinarresmi traditional village especially in rice or vegetables on the rice field or garden (talun) is only once a year. Meanwhile in the land of garden (talun) was conducted the planting of seasonal and annual crops. This farming pattern is to decrease the pest proliferate.

Prohibition of using machine in pounding rice or cutting rice when harvesting, because machine can remove the rice layer which called rice bran. Seeds that used is only the seeds that produced by traditional community, with natural fertilization. Chemical fertilizer like urea, and pesticide would kill
the flora and fauna in rice field and *huma*. Flora and fauna that developed in rice field was food materials that utilized by community as side dishes.

Mutual cooperation is a behavior that upheld by this traditional community, so there was social care between community members. Planting pattern, seeds usage, fertilization and behavior of mutual cooperation shapes the traditional village community to have a relatively high food security.

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