The local farming system based on custom and tradition to achieve sustainable agriculture in Baduy indigenous community

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Abstract. The Baduy Indigenous Community are in the Lebak Regency of Banten Province. The Baduy depends entirely on the agricultural sector, where the availability of agricultural land becomes very important. Baduy people have their customs related to the existence of agricultural land and have customary rights to the area and agricultural land. To ensure sustainable agriculture, the regulation of the local agricultural system, especially land use and management of the agricultural system is essential. This research explores how customs and traditions contribute to the achievement of sustainable agriculture in the indigenous Baduy community. The study used the qualitative methodology approach with research techniques observation, expert depth interview, people depth interview, literature study, and focus group discussion (FGD). The results of the study show that customs and traditions regulate local agricultural activities, both land tenure, and land-use arrangements and local agricultural activities. The existence of customary arrangements becomes the basic system of local Baduy farming that has an economic, social, and environmental perspective that is the basis for achieving sustainable agriculture in Baduy.

Keywords: Baduy, indigenous community, customs, local agricultural system, sustainable agriculture.

1. Introduction

Baduy tribe is an indigenous community inhabits in Kanekes Village, Leuwidamar subdistrict, Lebak Regency, Banten Province. The existence of the Baduy community is recognized legally by the existence of regional regulations in the Regency of Lebak. In Indonesian national law, the existence of indigenous peoples who have customs, habits, and ways of life that are different from the general community, are acknowledged and protected by law. Baduy indigenous communities have different customs and habits from other communities in the province of Banten so that the differences that make their lives unique. Their main livelihood is farming. The farming activities have their own unique rules based on the customary rules. The Baduy community consists of two groups, namely Inner Baduy and Outer Baduy. Both are two groups of people who obey the traditions that have been inherited by the past generations [1].

Baduy Community agricultural activities are regulated by the customary and have to be carried out, without anyone being violated. With the existence of regulations that have been traditionally and hereditarily inherited, the application of developing agricultural technology is a taboo. They have to apply agricultural techniques that are fixed, without any innovations that come from the development of modern agricultural technology. However, between preserving their customs and improving their lives...
as a human being has been discussed as a dilemma for years [2]. In terms of tenure and use of agricultural land, Baduy customs have regulated a permanent and fundamental way. Then this regulation has to be implemented by farmers in the community. This study will explore how the customary and traditional arrangements governing the local agricultural system are related to the achievement of sustainable agricultural goals in Baduy. Are agricultural activities based on the application of customs and traditions able to achieve three essential aspects in sustainable agriculture, namely the fulfillment of social, economic, and environmental aspects? Is the existing local farming system capable of supporting the sustainability of community livelihoods in the future?

2. Method
This study used a qualitative approach using several research techniques that are deepening the community under study. Researchers conducted qualitative research techniques emically, tried to stick with the community to obtain valid and accurate data so that they can understand the actual condition of the community. In-depth interview techniques, observations, and discussions were also applied to achieve the research objectives.

3. Result and Discussion

3.1. Baduy indigenous land management and utilization
The Baduy community has its territory based on communal rights. In the Lebak Regency regional sheet Number 65 of 2001 Series C contains the Lebak Regency Regulation Number 32 of 2001 concerning the protection of the customary rights of the Baduy people. Customary rights are authority according to customary law owned by specific customary law communities over certain areas which are the environment of their citizens to take advantage of natural resources, including land in the area called Ulayat land. Ulayat Land is the land upon which there are customary rights of a particular adat community. Customary land is intended for survival and life, arising from outward and inner relations between generations and uninterrupted between the customary law community and the area concerned. Their customary legal arrangements bind Baduy people as indigenous peoples. They are also citizens together with a legal alliance that recognizes and applies the provisions of its legal alliance in daily life, has customary territory and has a relationship with the territory. Baduy people in conducting relations with their territory are regulated and limited to their traditional land, so it needs to be protected. Protection is a consequence of the existing regulations, by the Regional Government and the community must protect the order of the Baduy community from interference originating from outside the Baduy community.

Three kinds of land utility exist in Baduy region, namely for dry agricultural land, residential land, and protected forest. The highest religious leader, Puun govern rules for the use of dry land for agriculture. The Puun regulates and divides the land to residents who are married — not allowed to work on land that is not designated. The custom determines the time to start farming activities, likewise for settlement arrangements. Customs through an arrangement decided by the religious leader (Puun) to determine which areas are used as residential land. Every married Baduy will get land to build houses and fields for farming. However, this ownership status is not owned land. Existing land remains customary property. For protected forests, divided into two areas, the first area is a protected forest area that can be entered by all Baduy residents. Baduy residents can take forest products with the conditions set by adat. In certain areas, it is justified to develop mixed agroforestry system that has become a culture for the Baduy community in utilizing their land [3]. In utilizing forests, Baduy residents are encouraged to use them wisely and pay attention to forest sustainability. In protected forest areas no land is allowed for agriculture. They have developed systems from their longstanding experience as their local wisdom than can sustainably adapt to their environment [4].

The custom in Baduy determines land for agriculture. There is an agricultural area that can only be cultivated by the religious leaders, which is called Huma Puun and Huma Girang Seurat. A specific field for rice considered sacred and located in Baduy is known as Huma Serang. Other, which is cultivated by all Baduy people is called Huma Tuladan. Farming activities in this area are carried out jointly, and the yield is also for the common good. Usually, the products are to be served on a sacred ceremony
dedicated to the rice goddess, Dewi Sri. Apart from these three types of areas, other agricultural areas can be cultivated privately by each family head and their members. The distribution of agricultural land has a difference in for two disparate groups of Baduy communities, the Inner Baduy community, and the Outer Baduy community. The Agricultural land distributed for Inner Baduy is a type of prohibited land. The Outer Baduy community can not enter this prohibited land. The area is more extensive than agricultural land for Outer Baduy. Therefore, due to lack of arable land, some Outer Baduy residents work on agricultural land owned by communities outside Baduy with rental status or profit-sharing. The existence of farming activities outside the Baduy tribe territorial makes the outer Baduy mobility more dynamic than the Inner Baduy.

Baduy people cultivate the land with communal ownership status due to the lands belong to the local custom, which is arranged by the religious leader. The lands are no privately owned and may not be traded. Available status of land ownership is only loans from communal rights. However, recently, Outer Baduy people tend to buy agriculture land owned by Non-Baduy communities. Therefore, that farm is privately owned by outer Baduy residents. The aim of those purchasing is to fulfill food needs since Outer Baduy people receive a less small number of communal land than Inner Baduy people.

In recent time, the problem related to the use of communal land, primarily agricultural land, arise. The supply of agricultural land area is fixed, while the population of Baduy continues to grow. So, the carrying capacity of agricultural land decrease continuously to meet the needs of communal food demand. On the other hand, the custom regulation has set land sustainability as the main focus in utilizing the communal land. The existence of customary rules prohibit exploitation of protected forests, exploitation of agricultural land, and changing the land contour to sustain the condition of the land. This rule is also supported by the application of a typical Baduy local farming system which also negates the negative impact of agricultural activities on land conditions.

3.2. Application of agricultural systems based on local custom
The Baduy community implements a local farming system that is different from the agricultural systems around it. These differences come from the application of traditional ways that have been inherited for generations. This difference is based on customary regulations and is a typical farming system. These characteristics include the tools and technology used, cultivation techniques, and the belief accompanied farming activities that are the spiritual aspects of these activities. These three things have an impact on aspects of production, social aspects, and environmental aspects of society.

The Baduy community recognizes dryland agriculture or cultivation only. Customary rules do not justify farming wetlands or rice fields. Generally, they grow rice and secondary crops in their fields. Farms use simple equipment, in the form of wooden sticks, small hoes, cleaver (a metal which is forged to be very thin and used to cut tree branches and clean the broth) and machetes. The custom does not allow the use of modern agricultural facilities and infrastructure. Not only modern equipment, but agricultural equipment and facilities that are used by the surrounding community alone also should not be used, such as hoes and hand tractors. They only use equipment that will not damage or change nature.

The farming is conducted in accordance with the land use cycle customary determined. The land is used only once a year, with a dry land paddy age of six months. Land that is tilled will move after only two harvests to four harvests, meaning that the land use cycle is two to four years, then they will work on new land. After two to four years of arable land, they will return to the previously arable land or open new land.

Rice seeds applied in dryland agriculture are local seeds which have cultivated for generations. Baduy people rely on rainfed farming because irrigation has not existed and prohibited in the agricultural system. Before starting farming activities, the religious leader will calculate the planting schedule based on astrology and their inspiration or spiritual message they accept from their ancestors (wangsit). The religious leader will instruct all residents to start clearing land and set a time for planting. All residents will obey this instruction. If there are residents who do not comply will be warned and get custom sanctions.

Several stages of farming activities, particularly for rice commodities in the local Baduy cultivation system include:
(1). **Narawas** (selecting land), this activity takes the form of selecting for **huma** (dry field paddy) as well as weeding. They apply the principle of shifting cultivation with the aim of resting the cultivated fields to restore land fertility. The custom also determined these land selection arrangements and governed by **Puun** (the highest religious leader). The regulation also sets the boundaries of arable land, to ensure fair and equitable distribution of arable land to all community members. If the selection of arable land has been determined jointly, then it will be followed by a sacred ceremony, begging **Sang Hyang** (God) for the cultivation activities to be carried out to fruition.

(2). **Nyacar** (land clearing), is the activity of cutting down grass, shrubs, and pruning small branches and collect them to dry. The farmers do not justify cutting down trees when clearing land. They only prune and cut tree branches so as not to block the sunlight needed in the process of planting rice. The land clearing ways of Badul people is known as pruning, not burnt cutting. According to tradition, the tools that can be used in this activity are the only cleaver. The cleaver is thin and even easy to bend. With tools like this, they cannot cut down trees, only small branches, twigs, shrubs, and grass that can be cut and then burned.

(3). **Nukuh** means drying grass, pieces of twigs, shrubs, and other slash products by the sun then collected into several piles for burning.

(4). **Ngaduruk** (burning) is an activity to burn garbage that has been collected in the time of **Nukuh**.

(5). Ngaseuk is making a small hole for planting rice seeds. Planting seeds into the hole is called by **muuhan**. Men usually works for **ngaseuk** followed by women who works for **muuhan**. The ngaseuk ceremony is only carried out in the field of **huma Serang** and **huma Tuladan**. The ceremonial activity has been started with bring down seeds (**nurunkeun binih**) from the granary which was carried out by women. In performing this ritual the participant have to wear a white shawl, white belt, and bun. At the time of ceremony, participants were forbidden from talking.

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(7). **Ngirah Sawan** (cleaning), namely the activity of removing garbage or remaining twigs from the sidelines of the rice groves.

(8). **Ngored** is an activity to clear land between rice groves using a small hoe. The small hoe is called kored, which has a short stem and is used explicitly by women.

(9). **Made** (harvesting) is carried out when the rice has yellowed and full filled or about six months after planting using ani-ani as a harvester. At this time, Baduy people present the largest traditional and religious ceremony, called **Kawalu**. During this ceremony, the whole Baduy community area was declared closed to all guests without exception, and angkling buhun is performed and played.

Baduy farming system does not use chemical pesticide to eradicate the pest. The Baduy people only use specific methods inherited from tradition and custom, such as pounding certain leaves to be applied to plants affected by the disease. Another way is asking the religious leaders to pray and recite mantras for plants affected by the disease. They believe that plant pests are an incarnation of a spirit disorder that can be eradicated by spells and prayers. They also cannot use chemical fertilizers. The fertility of plants is very dependent on the fertility of the land, which is maintained by shifting cultivation techniques.

Conducting farming activities for the Baduy community is not merely a means of earning a living, but also has an intrinsic meaning part of their beliefs. Farming is part of the implementation of customs and traditions that they hereditary maintain so that economic activities are attached to the custom activities and traditions. Farming is not only seen from the results of agricultural production, but also the meaning of blessing, which has been bestowed upon carrying out customary obligations. Therefore, in their agricultural activities, it is closely related to the implementation of sacred ceremonies related to
agriculture which is an expression of gratitude that the Almighty still gives residents life and agricultural products.

Traditional ceremonies related to agricultural activities include:

1. **Kawalu Mitambeyen** is held after harvesting by holding a salvage at the traditional hall in each of the customary institutions (Kepuunan). Three customary institutions exist, namely Kepuunan Cikesik, Kepuunan Kertawana, and Kepuunan Cibeo located in Inner Baduy. Participants of the ceremony came from the inhabitants of the Baduy tribe and outside Baduy residents. Provided dishes in this ceremony were taken from the Huma Serang granary (the results of past years of Huma Serang), and the innate ceremonial participants gathered and then distributed again after the ceremony was finished. The local religious leader of the Kepuunan where it took place presided over the ceremony and assisted by the assistants appointed by the religious leader. This ceremony is a gesture to the Baduy residents to harvest paddy plants in their private land. The harvested rice is tied and sun-dried to the floor (laid on bamboo provided) and covered by thatched roof along with the bamboo for a month.

2. **Kawalu Panengah**. After a month from the time of Kawalu Mitambeyen held, Kawalu Panengah led by Girang Seurat (Huma Serang) and by Kokolot (private paddy field), namely to select rice seeds for the planting in next season. Then, it was continued with the man flocked bring crops to the Huma Serang barn (ngunjal), while the women brought some rice to a place for pounding (saung lisung). This ceremony was conducted for a week.

3. **Kawalu Tutug**, was a ceremony held at the traditional hall which was centered in the traditional hall of Kepuunan Cikesik. This ceremony is a peak event of the series of the previous ceremony because it is the first event to taste this year harvested rice, in a manner determined by the religious leader (Punun). The event ended after sunset with a torch (bunar) led by Girang Seurat to return to their respective homes. On the following day, all Baduy residents were allowed to consume rice this year harvested.

4. Pilgrimage Ceremony to the Domas Area. After Kawalu Tutug, then a particular event is held namely Pilgrimage to the Domas Statue. This ceremony is kept a secret, so that most Baduy residents do not know the time, place, and who is leaving. However, usually, this pilgrimage is carried out after Kawalu Tutug as a thank giving to God (Sanghiang Tunggal) and the ancestors for the harvest they produced.

5. **Seba** (visiting the Government Officials). Seba is a traditional ceremony held after the pilgrimage to the Domas Area which has become a tradition, even according to the Baduy tribe, it is an obligation since their ancestors had to carry it out when they have been completed Kawalu Tutug. Seba was a mass visit with the intent and purpose of submitting a report on behalf of the religious leader about Baduy's condition to the Bapak Gede (Lebak Regent, Serang Regent, and Banten Governor) for one year. Seba is as a sign of friendship, recognition, and request for protection from the government official. The ceremony is also for surrender yields from Baduy people to the government to taste each other's harvests this year and usually reciprocated by the government by dividing food that is not available in Baduy area and giving other supports. In performing Seba, the Baduy people walked in gathering from the Baduy area to get the government office. The Seba ceremony is the culmination of a series of religious ritual conducting every year to express gratitude to God and the government for the prosperity they have gained during the year [5].

### 3.3. Achievement of Sustainable Agriculture

Achievement of sustainable agriculture is determined by the accomplishment of three factors: social factors, economic factors, and environmental factors. This point means that the achievement of sustainable agriculture in the Baduy community will depend on the Baduy farming system recognize these three factors. The social achievement has the meaning of how agricultural activities and utilization of agricultural resources to achieve welfare and provide a sense of social security for the community. Achievement economically means how the economic needs of the community related to the achievement of agricultural production at a certain level that can meet the needs of the community. Achievement in the environment means how agricultural activities can maintain and preserve natural resources,
especially agricultural resources and the utilization of agricultural resources while taking into account environmental aspects of the present and the future.

Baduy agricultural activities have a very high social value, because farming is considered not solely to earn a living, but also in order to find a living blessing and carry out obligations that have been hereditary regulated by the customs. Agricultural activities are considered as sacred activities which are part of worship that is obligatory for all citizens. The Baduy people interpret the hard work of cultivating agriculture as an effort to fulfill their obligations to God.

Baduy farming activities also have significant economic value. Whole farm product is consumed to meet family needs. The costumery mandates a ban on selling agricultural products in the form of rice commodities. After harvesting, the rice will be stored in a granary and become a family food reserve. Rice fields are the most important economic sector for all inhabitant. All married people are required to have their rice barn called Leuit. The leuit have not to be empty. Therefore they have to work hard in farming to keep getting good agricultural products then fill the leuit. The leuit which is never empty is a reflection of the availability of family food that is guaranteed. Baduy people are hard workers who work as a manifestation of their obedience to the customs and traditions that have been determined.

The environmental perspective can be analyzed from eco-friendly local wisdom accompanying each economic activity of the community, including the agricultural sector. From the economic view, besides cultivating dry land with the primary commodity of rice, they also take forest products to meet the economic needs of the family. They took some products from the protected forest recognized as customary land with a total area of around three thousand hectares. This forest can only be entered and took its product by Baduy residents. Forest products that can be collected and economically valuable include fruits, high-value wood such as gaharu, and honey. The customary rules noticed that inhabitant could only take them as much they need, not excessive. Taking forest products is also considered a sacred economic activity. Usually, residents ask permission from the religious leaders (Puum), then the Puum gives his blessing by praying together. Commonly, the customary leaders also get a share of forest products taken based on the sincerity of the people. There is a belief of inhabitant if they are greedy and excessive taking of forest products, they will get a punishment from the spirits of forest watchman. Picking forest products is justified, but cutting down wood in the forest without permission from the customary leaders is considered a taboo. Local people have been internalized to always take care of the forests that they acknowledged to be entrusted in their life.

In the field of agriculture, the Baduy protect land resources in environmentally friendly ways including using pest control of plant diseases using natural materials, not using pesticides because they think they will damage the environment, water sources, and the soil. To maintain soil fertility, they apply a shift cycle. They implement a local agricultural system based on local wisdom that pays attention to environmental sustainability and natural balance. The Baduy do not use modern agricultural tools and facilities because they are considered to damage agricultural resources in the long run.

6. Conclusions
The existence of customary arrangements and the belief of the inhabitant to persistently obey it brings them possible to achieve sustainable agriculture in the Baduy community. Sustainable agriculture in Baduy reflects the existence of an agricultural system that prioritizes the use of natural resources that can maintain the carrying capacity of the environment. Agricultural activities are not only intended for economic benefits but also seen how agricultural activities can be socially and environmentally valuable. It makes the local agricultural system in Baduy can avoid problems of damage to agricultural resources and can maintain natural conditions in the long run.

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