Local rice conservation through local wisdom of indigenous culture in Kasepuhan Cisungsang, Banten Province, Indonesia

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Abstract. Local wisdom is essential in the conservation of local rice. The utilization of local rice varieties has been carried out in the specific groups of people for centuries under local culture rules. Kasepuhan Cisungsang is one of the local cultures in Banten Kidul populated by indigenous people who still maintain local wisdom in rice cultivation. The research objective is to observe the role of Cisungsang indigenous culture in preserving local rice germplasm. The study was conducted in Kasepuhan Cisungsang, Cibeber District, Lebak Regency, Banten Province. The data used were primary and secondary data, with survey and desk study. The results showed that the law of Cisungsang culture applied not only to people and community life but also to agriculture, especially for rice cultivation. Rice, manifested as The Goddess “Dewi Sri,” has a noble position for indigenous people as it must be properly nurtured and nourished to provide optimal harvest. There were 30 varieties of local rice varieties grown in Kasepuhan Cisungsang and its surrounding areas. Still, only ten varieties were planted by the community, namely: Marileun, Terong Papak, Cireh Gudang, Kapundung, Tampay Beureum, Srikuning, Tampey Bodas, Nemol, Gadog, Angsana. The ten varieties were by the farmer preferences and adaptive strength in the local agroecosystem.

1. Introduction
Local rice varieties are now rarely found as local varieties that are planted every season. Along with the increase in green revolution technology since the 1960s, particularly with the introduction of high-yielding varieties, it has caused genetic erosion of local varieties [1]. Genetic erosion of rice plants will be more critical if there is no conservation of local varieties that still exist. Farmers still plant local varieties in certain areas because of the good rice quality with high selling prices [2]. Local varieties can also be found in areas that still maintain the local customs or beliefs to keep the presence of local rice as their ancestral heritage [3]. Kasepuhan Cisungsang is one of the Kasepuhan of the Banten Kidul indigenous peoples who still preserve local wisdom in rice cultivation.

The Kasepuhan Cisungsang culture group is an ethnic community in the vicinity of the Mount Halimun Salak National Park (Taman Nasional Gunun Halimun Salak, TNGHS), located in the Cibeber District of Lebak Regency [4, 5]. The Kasepuhan Cisungsang indigenous people are bound by a culture system that binds not only to social-cultural rules but also to plant cultivation. The diversity of local germplasm is still maintained even though the current development of new high yielding varieties is very intensively carried out by the government.

The management of plant ecosystems is adjusted according to custom, namely through the area management pattern established by the traditional Elders. Traditionally, traditional elders have
established landscapes of land management for generations. The land management landscape is divided into ten land-use arrangements consisting of: 1) lembur (settlement); 2) pakarangan (yard); 3) rice fields; 4) huma (dry land); 5) talun i satuhan (fruit garden); 6) sampalan (grazing fields); 7) reuma ngora (new openings fields); 8) reuma kolot (old open fields); 9) leuweung cadangan (new clearing forest); leuweung titipan (used forest); and 11) leuweung tutupan (conservation forest) [6].

The Kasepuhan ethnic group around the Halimun National Park mountain uses plants traditionally. The local plants identified in Kasepuhan Cisungsang consist of 20 local rice varieties, 30 types of vegetables, 30 types of medicinal plants, 28 types of food plants, two types of ornamental plants, two types of handicraft plants and one type of coloring plant [4]. These types of plants are still cultivated and well maintained, including in the management of rice cultivation.

One of them is the phenomenon of local wisdom in shaping the cultural abilities of people who depend on natural resources so they can manage and regulate natural resources in the environment they inhabit [7]. Local wisdom can be found in various sectors of human expression, including lifestyle, social patterns, perceptions, and orientation.

Local wisdom is the values that are created, developed, and maintained in local communities and because of their ability to survive and guide the lives of their people. Local wisdom includes various mechanisms and ways to behave and act as outlined in the social order [8]. Furthermore, the form of local wisdom in society consists of six dimensions, namely 1) local knowledge; 2) local value; 3) local skills; 4) local resources; 5) local decision-making mechanism; and 6) local group solidarity [8, 9].

Rice cultivation is hereditary as one of the very strong customary entities. Rice is a symbol of prosperity, togetherness, and devotion to God. Rice is the representative of the presence of Sang Hyang Dewi Sri on earth, who, based on the local community's belief, is the goddess of prosperity and life-giving. It is this wisdom and observance of this belief that has led to the continued preservation of local rice varieties in the region. It is because the system of rice cultivation is wisdom in the traditional knowledge of this ethnic group [4]. This study aims to inventory local rice in the Kasepuhan Cisungsang area and document the cultural function of cultivation practices to preserve rice plant germplasm.

2. Method
The study was conducted in the rendengan area of Kasepuhan Cisungsang, which is located in Kujang Jaya Village and Cisungsang Village, Cibeber District, Lebak Regency. This research was conducted in August 2019. Determination of location and respondent was carried out using a purposive sampling method. The research method was descriptive qualitative, which consists of primary data and secondary data. Primary data were carried out through in-depth interviews with key persons using a list of questions that had been prepared. Interviews with key persons were conducted to obtain accurate data about local knowledge related to biodiversity and about rice cultivation. Secondary data were collected from various sources, including BPS, related agencies/agencies, and scientific publications, such as books, journals, dissertations, and research reports. The resulting data were analyzed descriptively through data selection, presentation, and conclusions.

3. Results and discussion
Kasepuhan Cisungsang is in the Cibeber sub-district, Lebak Regency, Banten Province. Kasepuhan Cisungsang is part of the Banten Kidul community whose community ties are based on lineage equality, not based on the area of residence. The Cisungsang village area is 1600 (Figure 1) ha with a population of 2,364 people, and most of the community’s livelihoods are farmers. The population of farmers in the village of Cisungsang is 680 farming families [10].

Types of farming are still dominated by food crops, namely wetland rice, field rice, corn, and other crops (Table 1). This research focused on rice commodities, where rice is a commodity that has a high religious value amid the Cisungsang indigenous people. Rice is believed to be the incarnation of Dewi Sri so that the planting of rice is full of cultural values.
Cisungsang Paddy Cultivation has local wisdom of Banten Kidul rice, which is included in the Kasepuhan Cisungsang custom. In Cisungsang’s traditional culture, it is known as the local rice cultivation system, in which the implementation of planting to harvest still adheres to customary rules. It includes customary irrigation systems. Interviews related to rice cultivation were carried out in the Harapan Jaya Farmer Group in the Kujang Jaya village, Cisungsang District, Lebak Regency. Farmer groups have been established since the 1990s with 30 members. The chairman of the farmer Group, Mr Juhedi, is one of the Rendangan. Rendangan is representatives of indigenous peoples. Rendangan has the duty as an extension of Abah Usep Sunarya sr (Cisungsang traditional elders), especially in terms of carrying out traditions both in agriculture and in daily life. Another key person is the field officer in the Cibeber District.

All the commands, advice, and "provisions" from Abah are conveyed to Rendangan, and Rendangan conveys to incu putu (Indigenous Peoples). This limitation is the outermost fortress in maintaining the continuity of the implementation of tradition. Through the Rendangan, Abah’s message will be conveyed to indigenous peoples, and it is all binding, mandatory. Rendangan also receives information about what problems occur in the community, including the implementation of rice cultivation. Based on the results of interviews, rice cultivation is governed by a tradition called Ngamumule Pare (Glorifying Rice) with traditional rituals as follows:

1. Syukuran melak pare/Sapang jadian pare, the activities carried out before pre-planting activities.
2. Nibakeun Sri ka Bumi, the activities carried out at the time of seedling for 45 to 50 days.
3. Syukuran tanam, the activities carried out at the time of planting.
4. Jatnika / jarah naturkeun karahun (pilgrims following their ancestors), which is a ritual event held at Ajeng Kasepuhan Cisungsang before the harvest.
5. Ngamitkeun Sri ti Bumi, the activities carried out before picking or reaping the harvest that begins with a salvation ceremony conducted at the Kasepuhan house and begins with a joint prayer, followed by a meal together and entertainment by displaying Angklung Buhun and Dogdog Lojor.
6. Ngunjal, which is a storage of rice to the barn (leuit) after it is dried. This activity begins with a salvation event (prayer together) by providing Tumpeng and being accompanied by Dogdog Lojor and Rengkong.
7. *Rasul Pare di Leuit*, namely, presenting the Rice *Tumpeng Rasul* and golden yellow rooster. This activity is carried out and led by a traditional leader who is accompanied by seven *pake kolot* (seven parents were taken by lineage).

8. **Seren Taun**, namely storage rice to barns ceremony, is carried out every year and lasts for seven nights.

However, the Cisungsang culture is different from the culture of the Baduy tribe in the Kanekes region. Customary elders still try to accept technology without eliminating traditional values and traditions of managing agriculture by local wisdom. Technological innovations can be accepted, even though cultural internalization must remain through cultural integration or the agreement of elders. One example is the adoption of the New Ciherrang Rice Superior Variety, which occurred in 2008, and it has survived to this day. Likewise, the adoption of organic fertilizers (Urea, TSP, KCl, NPK) and chemical pesticides are used not only for New Improved Varieties (NIV) but also for local varieties (LV). The use of NIV, inorganic fertilizers, and pesticides cannot be separated from the role of extension workers who can fuse with the culture of the Cisungsang village community. Changes in aspects of production inputs are not always followed by changes in the way of cultivation. Changes are adjusted to customs. The following table presents Changes in Technology Innovation and the effect of changes in cultural practices (Table 1).

| Technological Innovations | Year | Cause of Changing | Changing Agents | Inputs to Production | Procedures for Cultivation |
|---------------------------|------|-------------------|-----------------|----------------------|---------------------------|
| New Superior Varieties    | 2008 | Government Program | agricultural extension workers | Ciherrang, Mekongga | 25 kg/h | Seeding by panicles |
| Inorganic Fertilizers     | 1986-1990 | Government Programs | agricultural extension workers trough Puun (customary leaders) | Urea, SP-36, NPK | 100 kg/h, 150 kg/h, 150 kg/h | Only organic fertilizer is applied during tillage only |
| Tractor                   | 1990 | Government Programs | agricultural extension workers trough Puun | Hand traktor | - | 100% Human and animal power |
| Pesticides 2006           | 2006 | Technological innovation of Instructors | agricultural extension workers trough Puun | Insecticides, Mollusicide, Fungicide | According to the recommended dosage | prayer spells, organic pesticides |
| Caplak 2007               | 2007 | Technological innovation of Instructors | agricultural extension workers trough Puun | Traditional planting equipment | - | Planting backwards and no adjustable size |

Source: interviews with key persons.

New technology was introduced and brought by agricultural instructors who had close relations with the customary leader. Agricultural extension workers have a large influence on technology adoption. Agricultural extension workers are playing a critical role in the transfer of new agricultural

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The table contains the following columns:
- **Technological Innovations**
- **Year**
- **Cause of Changing**
- **Changing Agents**
- **Inputs to Production**
  - **Type**
  - **Amount**
- **Procedures for Cultivation**
  - **Before**
  - **After**

- **Fertilization based on crop period:**
  - When planting
  - 7-20 HST
  - 30-40 HST

- **Carry out pest control according to the advice of the field instructors**
  - NIV 25 X 25 cm
  - LV 27 X 27 cm
technologies to farmers, which they can adopt to increase productivity, incomes, and standards of living [11, 12].

The introduction of NIV rice has been known since 2008 with Ciherang varieties. Local rice is planted earlier (October), while NIV rice is planted two months after local rice (December). This cropping pattern is beneficial because farmers can harvest the products simultaneously. The NIV planting, harvesting, and post-harvest systems are presented in Table 2.

Table 2. Differences in local technology and new improved varieties (NIV) (Figure 2).

| No | Activity       | Technological / Cultural Activities applied                  | Remarks                                      |
|----|----------------|-------------------------------------------------------------|----------------------------------------------|
|    |                | Local Varieties                                            | New Improved Varieties                       |                                               |
| 1. | Pre-planting   | Pre-planting ceremony                                      | -                                            | Syukuran melak pare/Sapang Jadian Pare       |
| 2. | Seedling       | Seedling in the form of malai                              | the seeds are spread                         | Nibakeun Sri ka Bumi                         |
| 3. | Planting       | half planting backward and a half planting forwards         | planting forwards with organic plus inorganic fertilizers | Syukuran tanam                              |
| 4. | Fertilization  | organic plus inorganic fertilizers                         | the dosage and application method are the same |                                               |
| 5. | The pre-harvest| ceremony before harvest                                    | -                                            | Ngamitkeun Sri ii Bumi                       |
| 6. | Harvest        | harvested tied                                            | harvested seeds                              |                                               |
| 7. | Drying         | in the rice fields/fields                                  | houses or hullers                            |                                               |
| 8. | Storage        | Leuit/traditional warehouse/barn                           | Leuit/traditional warehouse/barn             | Ngunjal ceremony for local rice, which is a ceremony to store rice in a barn floor     |
| 9. | Distribution and consumption | Not sold                                               | can be sold directly                        |                                               |

Source: Interview with key persons.
Government programs that lead to the intensification of agriculture by using high-yielding and early-age varieties result in the erosion of local varieties [13-15]. Types of local varieties in the Kasepuhan Cisungsang area are still developing approximately 20 species out of the 30 types of local rice found in this survey. The performance of local varieties and NIVs, which are still developing, are shown in Table 3.

Table 3. Types of rice growing in the Kasepuhan Cisungsang.

| No.  | Type of rice       | Agroecosystem | Characteristic                        |
|------|--------------------|---------------|---------------------------------------|
| 1.   | Nemol              | Wet land      | local varieties, longevity, white rice|
| 2.   | Tampeuy beureum    | Wet land      | local varieties, longevity, red rice  |
| 3.   | Tampeuy bodas      | Wet land      | local varieties, longevity, white rice|
| 4.   | Terong papak       | Wet land      | local varieties, longevity, white rice|
| 5.   | Ketan alean        | Wet land      | local varieties, longevity, sticky rice|
| 6.   | Ketan ulam         | Wet land      | local varieties, longevity, sticky rice|
| 7.   | Ketan hideung rante| Wet land      | local varieties, longevity, black sticky rice|
| 8.   | Srikuning          | Wet land      | local varieties, longevity, white rice|
| 9.   | Marileun           | Wet land      | local varieties, longevity, brown rice|
| 10.  | Pare Beureum       | Dry land      | local varieties, longevity, brown rice|
| 11.  | Ciherang           | Wet land      | NIV, Early maturing, white rice       |
| 12.  | Situbagendit       | Dry land      | NIV, Early maturing, white rice       |

Figure 2. (a) Leuit, a traditional local rice long-term storage; (b – d) local rice drying directly in the fields by hanging it on a "gantar" made of bamboo in Kasepuhan Cisungsang.
4. Conclusion
Cisungsang traditional culture is known as the local rice cultivation system, which the implementation adheres to customary rules. Technological innovations can be accepted even though cultural internalization must remain through cultural cohesion or cohort agreements. One example is the adoption of New Ciherang Rice Superior Varieties, inorganic fertilizers (Urea, TSP, KC1, NPK), and chemical pesticides used by pest control. Types of local varieties in the Kasepuhan Cisungsang area are still developing, approximately 20 species out of 30 types of local rice are found in this survey, including Nemol, Tampay Beureum, Terong Papak, Sticky Rice Ulam, Marileuen, etc.

Acknowledgment
Our special thanks of gratitude belong to Agus Halim Lesmana (for the Maps), farmers Rendangan Cisungsang Kasepuhan Mr. Juhaedi, Cibeber Extension Officer Mr. Asep, and his team, as well as the people of Cibeber region for their help and support.

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