Cultural Space Methodology on Assessment of Authenticity of Indigenous Community Forest and Conservation Area in Indonesia

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Abstract

Indigenous knowledge is proven to be one of the foundations of sustainable land and marine management. While indigenous knowledge is acknowledged as of important factors on maintenance of biodiversity of the planet, it also ensures the sustenance of social and economic system of indigenous community. To facilitate the application of indigenous knowledge on management of customary forest in Indonesia, since 2012, the Government of Indonesia has been providing formal access for indigenous communities to their forests to maintain forest sustainability and to enhance the welfare of indigenous community. Nonetheless, the achievement of sustainable development goals in the scope of forest and conservation area management is threatened by various competing interests and power imbalance, which mostly leads to conversion of naturally vegetated area, as well as the inability of the community to integrate new economic opportunities to its institution. Moreover, the Government of Indonesia has not been regulating the involvement of indigenous community on the management of conservation area. Most importantly, such a program provides no reference on indigenous community, especially on the assessment of authenticity of indigenous community's forest. Cultural space methodology may fill the aforementioned gaps. The methodology was developed based on the notion of cultural space and land administration, particularly the people-and-land/marine space relationship. Moreover, such a methodology was also constructed based on the experiences of agricultural and maritime communities in Indonesia on the administration of their territories. The methodology provides a procedure to convert information on the interrelation of indigenous community, its cultural space in forest and conservation area, and indigenous knowledge into geospatial information and data that represent the cultural space unit as a geographic feature. Therefore, such methodology may be utilised to assess the authenticity of a long-existing relationship between a community, especially an indigenous one, and its land, particularly that serves conservational function.

Keywords: cultural space, indigenous community, Indonesia, methodology

1. Introduction

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Indigenous knowledge is proven to be one of the foundations of sustainable local land and marine management. Indigenous knowledge is understandings, skills and philosophies developed by local communities in a long period of time based on their interaction with their surroundings (Hiwasaki et al., 2014). Such knowledge is spatially, physically and/or culturally very detail, context specific, collective, holistic and adaptive (Altieri, 2001; Mistry, 2009). The knowledge acts as the basis for local level decision-making, which is considered as of the important factors to achieve food security, to maintain human and animal health and to ensure the performance of educational, economic and social activities (Kanyama-Phiri et al., 2017). Especially on indigenous people welfare enhancement, application of indigenous knowledge on land management also provides economic opportunities for indigenous community (Sangha et al., 2020).

Indigenous knowledge is also responsible for maintaining biodiversity of the planet. Although indigenous peoples make up only 4% of the world's population (Sobrevila, 2008), they maintain 11% of the world's forest (White et al., 2004, as cited in Sobrevila, 2008). While their territories cover 22% of the world's land surface, these communities have been maintaining 80% of biodiversity of the Earth (World Resources Institute, 2005, as cited in Sobrevila, 2008).

Social forestry, which is also known as community-based forestry or participatory forestry (Gilmour, 2016), is one of the options to provide access to forest for various types of community, to enhance people's welfare and to maintain environmental carrying capacity (Gilmour, 2016, Stanzel et al., 2020). Social forestry has even been employed to solve global problems, such as trade liberalisation, climate change, illegal logging and payment for environmental services (Gilmour, 2016). Furthermore, social forestry may provide authority for indigenous community to apply indigenous knowledge on management of the customary forest (Abdulharis et al., 2019).

Having been driven by the result of the judicial review of Forestry Act of 1999 by the Constitutional Court, a revolution on forest administration in Indonesia, particularly by means of social forestry, has been on-going since 2012. In the aforementioned act, it was previously regulated that customary forest was classified as state forest that is located within indigenous community territory. Constitutional Court granted the claim of indigenous communities in Indonesia that customary forest should be managed by the indigenous community in question.

The verdict urged the Government of Indonesia (GoI) to revolutionise forest administration in Indonesia in two ways. First, indigenous community becomes the eligible subject of forest tenure. Under 1960's Indonesia land law, it is either individual(s) or enterprise who is eligible to be the subject of various types of land tenure, including forest tenure. Furthermore, although Article 34 of 1999's Forestry Act states that indigenous community may manage forest, not until 2014 did GoI promulgate derivative regulations that allow indigenous community to become a subject of forest tenure.

Unlike individual or enterprise who can automatically become the subject of any type of land tenure in Indonesia, indigenous community must go through processes of identification, validation and verification of authenticity of its institution and territory. According to the Decree of Ministry of Internal Affairs (MoIA) no. 52 of 2014, the processes should be initiated by local government by considering five factors, namely (1) history, (2) territory, (3)

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customary law, (4) property and/or wealth and (5) institution or customary government system of the indigenous community in question.

Second, GoI may delegate the authority to manage customary forest to the indigenous community, which acts as an enhancement of social forestry scheme in Indonesia. In 2014, four ministers, namely MoIA, Minister of Environment and Forestry (MoEF), Minister of Public Work (MoPW) and Minister of Agrarian Affairs and Spatial Planning (MoAASP), promulgated a joint decree to regulate the conveyance of forest tenure to indigenous communities. MoEF further regulates the implementation of the joint decree by means of the Decree no. 32 of 2015 and no. 83 of 2016 concerning forest tenure and social forestry consecutively. Furthermore, the President of Indonesia promulgated the Decree no. 88 of 2017 to synchronise the conveyance of forest tenure to communities, including indigenous community. Moreover, MoEF promulgated the Decree no. 34 of 2017 on the recognition and protection of indigenous knowledge on indigenous community forest management. In 2019 MoEF revised the 2015's regulation on forest tenure, which was revised again in 2020.

Delivery of forest tenure to indigenous community is expected to lead to the application of indigenous knowledge on forest management, not only to maintain forest sustainability but also to enhance the welfare of indigenous community. As reflected in the Article 18B and 33.3 of the 1945 Constitution of Indonesia, the objectives of recognition of indigenous community forest are two-fold, namely to acknowledge and respect indigenous communities and their customary rights, including indigenous knowledge, as well as to provide a greatest benefit from forest management to such communities. Moreover, Act no. 41 of 1999 concerning Forestry regulates in more detail sustainable forest management. Most importantly, objectives of sustainable forest management in the scope of recognition of indigenous community forest are expected to be achieved by acknowledging and protecting the application of indigenous knowledge on forest management, which is regulated by the Decree of MoEF no. 34 of 2017 on the Acknowledgement and Protection of Indigenous Knowledge on Management of Natural Resources and Environment.

While social forestry promises benefits for people and the environment, it also poses several threats (Wittayapak & Baird, 2018). Among the identified threats and their effects is, first, the competing interests and power imbalance among actors that tend to marginalise less powerless actors on making their land (Yusran et al., 2017; Fisher et al., 2018). Second, multiple use of protected forests and/or conservation areas is likely to lead to conversion of naturally vegetated area (Françoso et al., 2015; Ferreira, 2018). Third, the inability of community to integrate new economic opportunities to its institution (Fisher et al., 2018) and to secure operational funds (Scudder et al., 2018) may lead to failure of social forestry to enhance community's welfare. Among the cause of such a failure is the lack of capacity building program for the community on sustainable forest management (Erbaugh et al., 2016; Galudra, 2019, Watts et al., 2019; Erbaugh, 2019).

Most importantly, indigenous knowledge is not yet considered to be the factor to validate and verify customary forest claims in Indonesia. As previously mentioned, there are five factors, including customary law, which are utilised on validation and verification of customary forest claim. Nonetheless, indigenous knowledge is not the same as customary law. The knowledge represents the identity of the people and acts as a basis on the establishment of indigenous law (Tobin, 2008; Friedman, 1975). Indigenous knowledge also guides the development of institution, as well as institutional and personal capacity building programmes within the community in question, which, in turn, creates a balance between social and economic

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development goals and social values and environmental carrying capacity preservation objectives (Abdulharis, 2014).

Cultural space methodology is proposed to be a tool to acquire a comprehensive proof on the authenticity of indigenous community, as well as indigenous community's forest and conservation area. Moreover, such a methodology is also proposed to be utilised on validation and verification of the above in the scope of alienation of indigenous community's forest and conservation area in Indonesia. Cultural space methodology is a set of procedures to identify and assess interrelationship between people and land, in this case indigenous community and its territory, as well as its dynamics, which is described by cultural space and indigenous knowledge on related matters that has been utilised on management of the aforementioned space. Cultural space itself is defined as an accumulation of social activities that are carried out in spaces in territory in question over time (St. Clair & Williams, 2008).
Above all, the cultural space methodology is capable of providing solutions for the aforementioned threats. The methodology utilises cultural space and land administration concept to analyse the above interests, which was recommended by Maryudi and Sahide (2017) on the implementation of Actor-Centred Power (ACP) approach. By combining the aforementioned concepts, the methodology may be utilised to identify the real and competing interests on the management of indigenous community's forest and conservation area by assessing the application of indigenous knowledge in the areas. The methodology is also capable of identifying the outcomes of application of indigenous knowledge, particularly concerning the sustainability of social and environmental system in the area in question. Furthermore, the methodology can also be utilised to assess the institutional and human resources capacity on the management of forest and conservation area. Therefore, the utilisation of the methodology may predict future outcomes and impacts of application of indigenous knowledge on customary management of forest and conservation area.

A detailed description on the cultural space methodology is given in this paper. First, the methods that were utilised to develop the methodology are explained. Second, the concept that was used to develop the conceptual framework of this research, particularly on the administration of people-land relationship, are given. Third, findings on the evidence f the interrelationship between indigenous community and its territories, as well as the outcomes and the impacts of application of indigenous knowledge on customary sustainable management of forest and conservation area in the case study areas, are provided. Fourth, the construction of the methodology and the discussion on improving the policies and regulations to acknowledge indigenous community's forest and conservation area in Indonesia are revealed. Last but not least, conclusions on the application of cultural space methodology to assess the authenticity of indigenous community's forest and conservation area in Indonesia are given.

2. Methods

Cultural space methodology is a product of a long-term research in customary land and marine administration in Indonesia. Deductive-qualitative and case study were the main approaches that were utilised in this research. A study on customary land administration in Kasepuhan Ciptagelar was initiated in 2007. The 103,000 hectares territory of indigenous community of Kasepuhan Ciptagelar is located in the Municipality of Bogor and the Municipality of Sukabumi in the Province of West Java, as well as the Municipality of Lebak in the Province of Banten. The territory of this community also overlaps with Mount Halimun-Salak National Park. Having its root as a food-gathering community (Pers com.

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Rakasiwi, 2018), this indigenous community is known for their strong agriculture culture, both irrigated and non-irrigated, which relies on the sustainability of protected forest and conservation areas (Kusdiwanggo, 2007).

Furthermore, the cultural space methodology was also developed based on the outputs of researches in customary marine administration in the City of Ambon and the Municipality of Central Maluku, Province of Maluku, since 2008. Indigenous communities in the those areas have been customarily maintaining marine protected areas for centuries (Novaczek et al., 2001; Abdulharis, 2014).

The aforementioned case studies were chosen to acquire the common practices on customary management of forest and conservation area in Indonesia. According to Boelaars (1984), indigenous community in Indonesia is classified under four main groups, namely food-gathering, non-irrigated or irrigated agriculture, or maritime community. However, as indigenous knowledge is developed based on the interaction between the indigenous community in question and their surroundings, local social, economic and environmental characteristics shall be taken into account during the replication of this study.

The data used to develop the methodology was mainly collected by means of field observations and interviews. Parts of data and data analyses have been published, mainly in Common Room (2017) and Abdulharis (2014). During field observations, visual ethnography was also exercised to provide a more detailed input for analysis.

To develop cultural space methodology, analysis on customary land and marine administration in case study areas was performed. This also included analysis on its legal, institutional and technical aspects. The customary land and marine administration systems were structured using the concepts of land administration by means of classificational analysis. Conceptual frameworks of the researches were mainly developed by utilising secondary data analysis, while analysis on policy and regulations on land and marine administration, as well as acknowledgement of indigenous community's forest and conservation area in Indonesia, were done by content analysis.

3. Theory

People see land in different ways, while, on the other hand, such perception also evolves over time. People have long been relying on their land as part of the surrounding environment to provide them with the means of living, from common-pool resources attached to it to resources that are nurtured in, on and above the land (Williamson et al., 2010). Land was used to exhibit social status during feudalistic era and was evolving to become economic capital during industrial revolution (Ting and Williamson, 1999).

Furthermore, the meaning of land goes beyond its environmental, social and economic function for several societies. While several societies see land as communities' scare resources (Ting and Williamson, 1999), several other communities look at their land as the territory to implement indigenous knowledge, particularly in the scope of sustainable management of natural resources (Mulrennan and Scott, 2000; Williamson et al., 2010; Abdulharis, 2014). Several communities have even developed spiritual relationship with their land (Harsono, 2013; Abdulharis, 2014).

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Land administration concept has been developed to regulate people-land relationship (Dale and McLaughlin, 1999). Land administration regulates rights, restrictions and responsibilities (RRRs) of the people on the tenure, use, development and valuation of land by means of alienation of legal rights to land, valuation and taxation of land, spatial planning, land use controlling, construction planning and provision of permit of construction (Williamson et al., 2010). Moreover, land administration system represents the people's point of view on land as it acts as the main tool on the implementation of land policy and land management strategies (Williamson et al., 2010).

The concepts of cultural space and land administration are basically interrelated as they were developed based on social activities of people on the land. According to cultural space definition, social activities practised upon land over time shape cultural space. On the other hand, from the perspective of land administration, land administration is expected to manage RRRs by dealing with the business processes and administration systems affecting and influencing people's activities in relation to space (Williamson et al., 2010). Moreover, land tenure, which describes the manner in which rights in space are held, is defined by a broad set of rules that may be defined through laws or determined by custom (Dale & McLaughlin, 1999). While land tenure is a concept to explain how people approach and think about space (Williamson et al., 2010), the land tenure system is developed based on the social activities that are performed, which shape the approach and perception. Likewise, land use and development system are built in accordance with social activities that are practised upon space (Dale & McLaughlin, 1999). Furthermore, while the value of every space can be identified, every cultural space can be considered as tangible and/or intangible assets as well (Williamson et al., 2010). Additionally, land administration system is a dynamic one, which may evolve over time (Williamson et al., 2010). Therefore, both concepts consider time and space simultaneously on land management.

4. Findings

In this section, the interrelationship between indigenous community and customary forest and conservation area is given. Furthermore, this section also provides the outcomes and the impacts of application of indigenous knowledge on customary sustainable management of forest and conservation area in the case study areas.

Having analysed data collected by means of interviews and field observations, the interrelationship between indigenous communities and their forest and conservation areas are represented by (1) knowledge, practices and/or objects that represent the relationship; (2) arrangement on administration of forest and conservation area; and (3) social, economic and physical function of space for the community.

4.1 Knowledge, Practices and/or Objects of Relationship

The evidence on the relationship between the studied indigenous communities and their forests is abundant. Evidence on such a relationship is the existence of (1) shared narratives, folklores and collective memories; (2) toponyms; (3) archaeological remains and natural objects and/or phenomena; and (4) social practices that represent the relationship.

Shared narratives, folklores and collective memories represent the fundamental of existence of most indigenous communities over space that was, is and will be occupied. The narratives and folklores have been transferred for generations by means of a knowledge transfer system

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that are embedded in institutional arrangement of communities' space administration systems, which are explained later on in the section on forest and conservation area administration system of the studied communities.

Indigenous community of Kasepuhan Ciptagelar, which is a community with a strong padi culture, has been migrating its indigenous governance centres within an area that extends approximately 103,000 hectares since 1368 (Kusdiwanggo, 2017). The latest indigenous governance centre of this community is located in Ciptagelar Hamlet of Municipality of Sukabumi, Province of West Java. According to the elders, the area of Ciptagelar Hamlet was previously a forest reservation area of Cicemet Block, which was initially opened for rice fields of this community in 1942. The hamlet was founded at a part of the cleared forest in 2001.

Moreover, the indigenous community has been managing an approximately 50,000 hectares forest reservation area. According to the elders, the forest has been defined as a reservation area by their ancestors since time immemorial.

The forest of the community is classified further into forest zones, whose functions are explained later on in the next sub-section on social, economic and physical functions of indigenous community's forest and conservation area. Between the latest and the previous indigenous governance centre of Ciptarasa Hamlet, there are 13 forest zones within a 4,000 hectares forest of indigenous community of Kasepuhan Ciptagelar.

In Haruku Village of Municipality of Central Maluku, Province of Maluku, there is a folklore concerning the protection of *lompa* fish, *Trisina baelama* (Kissya, 1987). In the protected area of Learisa Kayeli River, it was believed that there once lived a female crocodile who lived with the people of Haruku Village. One day, at the end of its pregnancy, the female crocodile was asked by other crocodiles of Seram Island to help them fight a gigantic snake in the island. The female crocodile was able to kill the snake but it was badly wounded. Before it died, the female crocodile gave birth and, as a gift, the crocodiles of Seram Island provided *lompa* fish to feed its children. Having been returned to Learisa Kayeli River, the children of the female crocodile stayed in the estuary of the river and *lompa* fish annually return to be eaten by them. Based on the folklore, the estuary of the river has been defined as *lompa* fish conservation area. See Figure 1 for *lompa* fish conservation area in Haruku Village.

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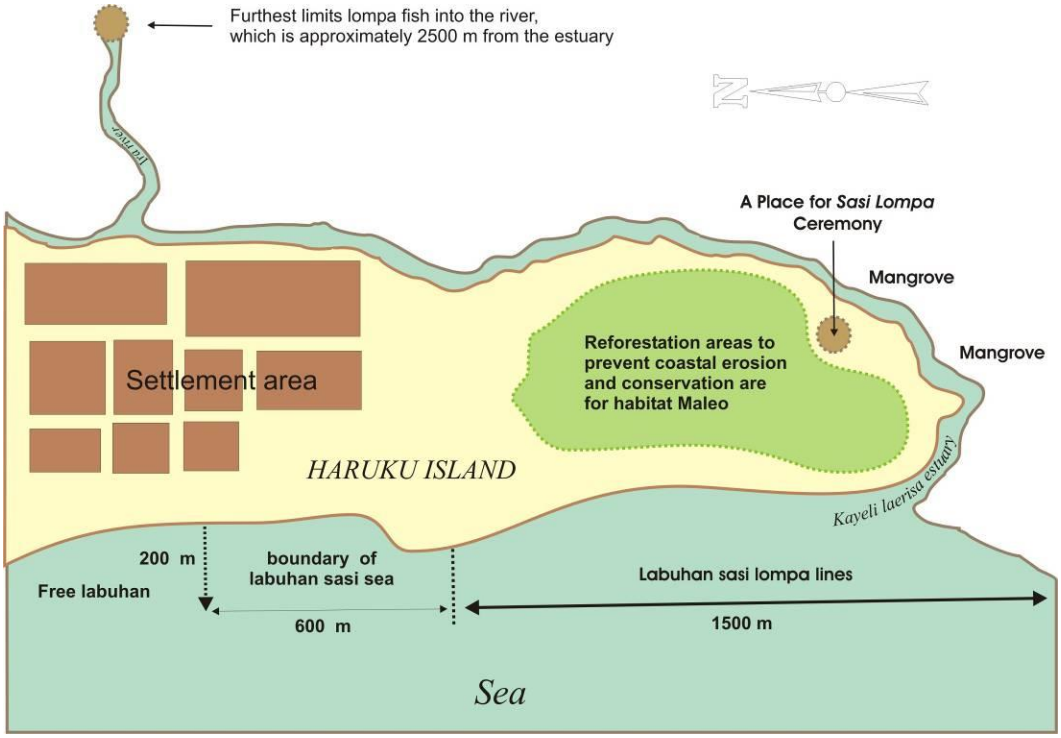

Figure 1 *Lompa* fish conservation area in Haruku Island, Municipality of Central Maluku, Province of Maluku (Kissya, 1987, as cited in Hernandi et al., 2011)

Moreover, the shared narratives and collective memories of indigenous communities in Maluku Islands have led to the sustainability of the Banda Sea, which is surrounded by in-shore conservation areas (Novaczek et al., 2001; Abdulharis, 2014). The aforementioned marine conservation areas uphold several functions but particularly act as a breeding ground of tuna (Abdulharis, 2014). Furthermore, the Agency for Local Development Planning of the City of Ambon (2006) reveals that indigenous knowledge on the exploitation of tuna has been able to limit tuna exploitation below its sustainable yield. These are several reasons to the fact that the stock of tuna in Banda Sea is considered among the largest in the world (Marten et al., 1982). See Figure 2 on in-shore conservation area of Nolloth Village.

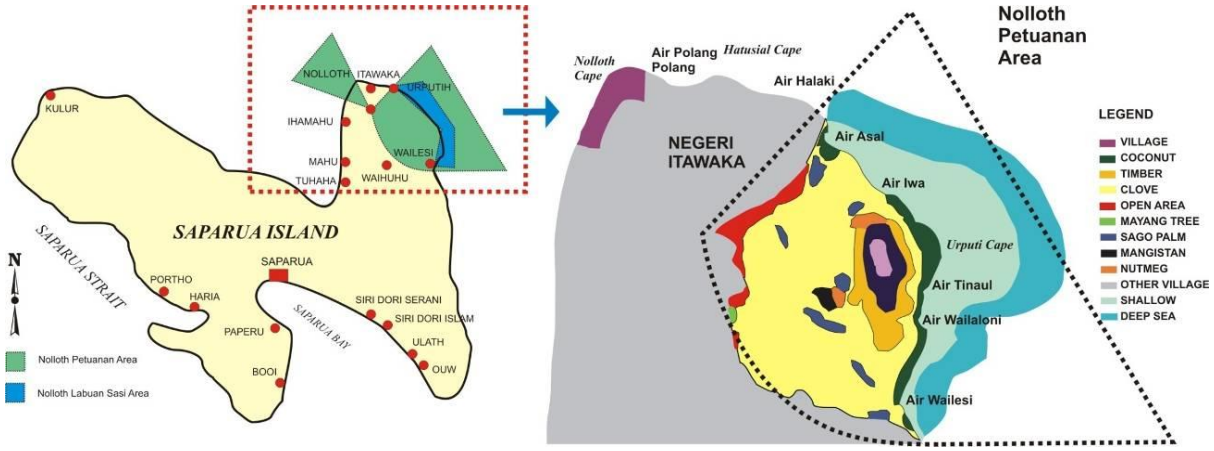

Figure 2 In-shore conservation area of Nolloth Village (Hernandi et al., 2011)

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Toponym also acts as evidence on the relationship between the community and its forest and conservation area. Each zone was named based on specific landmark, such as Bent Sugar Palm Block or *Blok Kawung Bingkeng*. Today, the sugar palm that was utilised as a landmark for naming the zone no longer exists. However, the location of the landmark is now identified by a ridge called Bent Sugar Palm.

Moreover, there are archaeological remains that provide another evidence on a long interrelationship between the community and its forest and conservation area zones. According to the elders, such remains were built by their ancestors. Each remain has a certain function, which is described in the section on social, economic and physical function of forest and conservation area. See Figure 3 for one of the archaeological remains in the territory of indigenous community of Kasepuhan Ciptagelar.

Figure 3 One of the archaeological remains in the territory of indigenous community of Kasepuhan Ciptagelar

In Maluku Islands, the indigenous community's in-shore conservation areas, known as *labuan* in the local language, are marked by the beginning of sea trenches (Abdulharis, 2014). The sea trenches are mostly located at 10 to 20 meters from the corresponding coastlines (Abdulharis, 2014). The *lompa* fish conservation area is also marked by the beginning of sea trenches (Hernandi et al., 2011).

Social practices also act as a strong evidence on the interrelationship between people and space. Social practices are practices that are typically and habitually performed in a society (Holtz, 2014). Indigenous community of Kasepuhan Ciptagelar has been continuously monitoring its forest. A special task force to monitor forest condition exists, comprising of representatives of clans that are responsible to perform this task for generations. The task

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force has been collaborating with the Mount Halimun-Salak National Park to perform its duty.

Agricultural practices of indigenous community of Kasepuhan Ciptagelar with regard to forest protection also exist. Several important forest products, such as housing materials, firewood and medicinal plants, have been cultivated in orchards that belong to the members of this community. Such arrangement has been proven to protect the forest from overexploitation.

Most importantly, such community performs a special ritual that precedes any activity of the community for generations, including forest-related activity. Before performing any activity related to its forest, the leader of the activity burns an incense on a coir and explains the purpose of the activity in front of participants. As this community believes that natural objects are alive, such ritual also acts as a means to inform all natural objects in the area concerning the activity. Most importantly, such ritual is expected to maintain a balance between human activity and environmental rhythm. Therefore, the ritual acts as a testimony on the importance of space to accommodate human activity. See Figure 4 for a ritual performed before initiating the mapping of forest of indigenous community of Kasepuhan Ciptagelar.

Figure 4 Ritual that preceded mapping activity, which was performed in one of the archaeological remains in the territory of indigenous community of Kasepuhan Ciptagelar

4.2 Administration of Forest and Conservation Area

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The existence of space administration system may represent an interrelationship between people and space by means of indigenous knowledge. As explained earlier, such an interrelationship drives the development of RRRs on space management, which normally exist in the form of indigenous knowledge and implemented by means of space administration. Furthermore, the system controls social behaviour of people in relation to space (Willamson et al., 2010).

To ensure the sustenance of their social, economic and environmental systems, the studied indigenous communities developed their own systems of space use. The indigenous community of Kasepuhan Ciptagelar divides its territory into forest reservation areas and production forest, in which settlements and fields are located. The utilisation of the term production forest instead of settlement, cultivation area, or rural area reveals the basic identity of this community as forest people, where the civilisation of Kasepuhan Ciptagelar has been evolving from food-gathering into agricultural culture. Moreover, the indigenous community of Kasepuhan Ciptagelar further classifies its forest reservation area based on social and physical functions of the forest.

The tenureship of forest was developed to guarantee a good performance of space use arrangement. Forest reserve is considered to be one of the types of tenure of the Kasepuhan Ciptagelar community besides production forest. The term forest reserve includes the right of the community to benefit from the forest, particularly for customary purposes, as well as restrictions on exploring and exploiting the forest for other purposes besides the customary ones. Even a twig is not allowed to be taken from the customary forest. The forest reserve also incorporates responsibility for the community to protect the sustainability of the forest based on the indigenous knowledge within the area in question.

Due to the above RRRs, most members of Kasepuhan Ciptagelar plant various types of plants on their private plantations, particularly to fulfil the needs on housing materials and firewood. While a lot of housing materials are required to renovate or build new houses every 10 years, firewood is needed every day in Kasepuhan Ciptagelar. Such a practice has been reducing the anthropogenic pressure to the customary forest of Kasepuhan Ciptagelar, which acts as one of the factors that leads to the sustainability of the forest.

In Maluku Islands, space is classified based on its social, economic and physical functions as well. *Labuan* is one of the space use classes in most indigenous communities' territories. *Labuan* also acts as a space tenure, which regulates RRRs of the indigenous communities in the islands. The eligible subject of *labuan* is the member of the indigenous community in question. In *labuan*, every member of the community in question is allowed to fish using only traditional boat without an engine attached to it. Further restriction is the use of fishing nets with a specified minimum mesh size. As mentioned in Section 4.1, *labuan* acts as the nursery ground of particularly pelagic fish of Banda Sea. Such a mesh size specification is regulated to ensure the pelagic fish seed will not be caught. Every member of the community is obliged to obey the rules and to inform the customary government in the case of violation of the rules.

4.3 Social, Economi and Physical Functions of Space

Social, economic and physical functions of space to indigenous community are considered to be other important factors that reveal the interrelationship between the community and its space. In the case of the studied indigenous communities in Indonesia, such functions contributed to development of the communities' space administration system. Furthermore,

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the performance of space administration by these communities drives the development of shared narratives and collective memories as one of the methods of intergenerational knowledge transfer, as well as the creation of space for social activities that are marked by toponym and archaeological remains. Space administration system also regulates social practices in relation to space that is managed by the communities.

While the function of space in forest and conservation area may mostly be identified from shared narratives and collective memories, particularly concerning social function of the areas, it is the physical function of space that initially shapes space administration system in the territories of indigenous communities that were studied. Such function may be explained mostly by in-depth research concerning social function of the space in question, which normally involves analysis of data concerning environmental characteristics of the space.

Having adapted to their environment and developed their space administration systems, the studied communities take benefit from their environment, both socially and economically. The communities acquire resources for their social and economic needs from their territory. Furthermore, space administration system lays the fundamental of interrelation between the communities and their spaces, whose main purpose is to ensure the environment to provide the communities with long-term social and economic benefits.

The 4,000 hectares forest of indigenous community of Kasepuhan Ciptagelar is functioning as a reserve for the community. According to the shared narrative from the elders, such area will mainly be functioning either for agricultural purposes and/or settlement. The forest upholds abundant stock of housing materials, as well as firewood. Moreover, such forest also acts as water catchment area and comprises of springs and streams, which were only identified by means of hydrological analysis. This was because the streams were covered by forest canopy, which could not be identified from the base map, particularly because the mapping was performed by photogrammetry. See Figure 5 for the hydrological system of the 4,000 hectares forest of indigenous community of Kasepuhan Ciptagelar. In Figure 5, streams within areas that are delineated by the boundary in red were acquired from hydrological analysis. Also, at the moment, the forest provides considerable natural resources for rituals practiced by the community, such as deer and various types of leaves. See Figure 6 for *rawun*, which comprises of several types of leaves, a stereometric ornament that is installed during *ngarawunan* ritual at patrimonial rice field after the pollination of rice. The leaves of rawun installation represent the expectation of the community to their crops. The leaf of *Ki Tai* or *Dysoxylum gaudichaudianum* in the installation represents the expectation on fertility of rice crops. *Tai* in Sundanese language means faeces, which is normally utilised as fertilizer. Also, chilli leaf acts as an expectation on delicious flavour of rice, particularly because chilli paste is used to add flavour to several typical dishes of Indonesia and this community.

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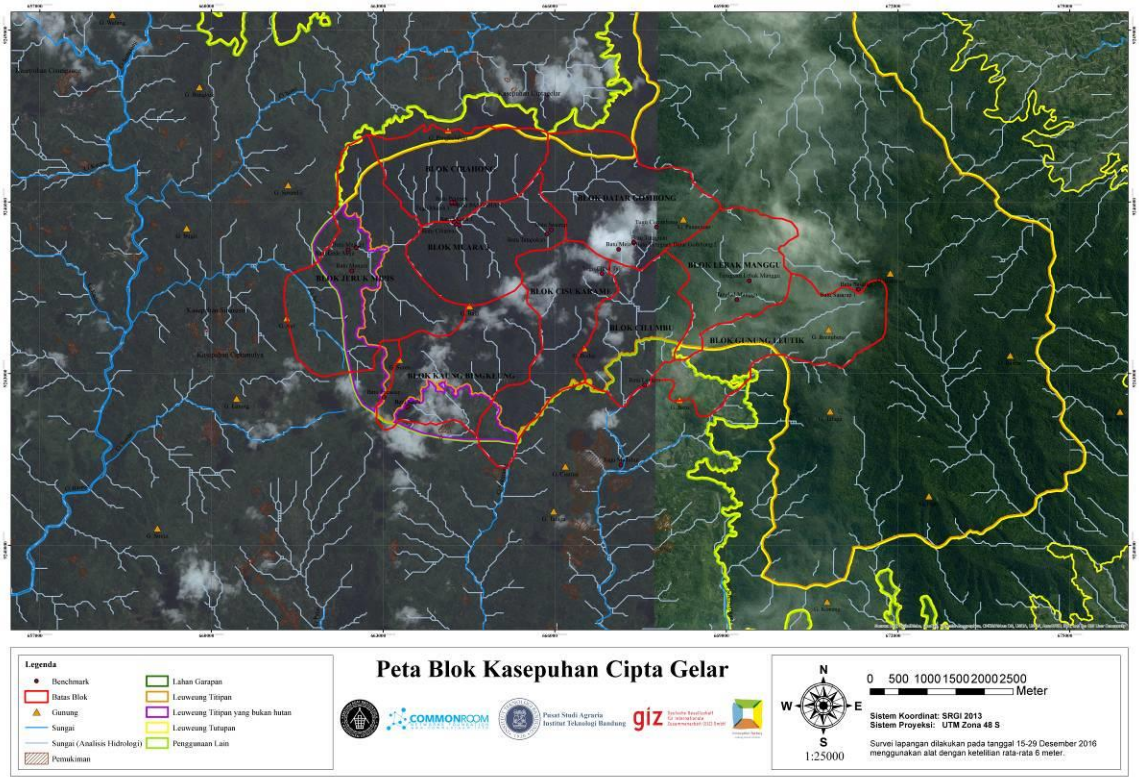

Figure 5 Hydrological map of the 4,000 hectares forest of the indigenous community of Kasepuhan Ciptagelar, which shows streams that were acquired from hydrological analysis in areas with the boundary in red.

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Figure 6 *Rawun*, a stereometric ornament installed in patrimonial rice field, which comprises of various types of leaves that represent the expectation of the community to their crops.

As described earlier in the previous sub-section, the forest of indigenous community of Kasepuhan Ciptagelar is classified further into several forest zones. In the 4,000 hectares forest of this community, there are 13 forest zones. Each forest zone upholds adequate resources for agricultural purposes and/or settlement. Moreover, each forest zone is functioning either as a forest reserve or forest buffer area. The forest reserves are surrounded by the buffer areas, reflecting the function of buffer areas to delineate the forest reserves. In the 4,000 hectares forest, there are 10 reservation forest zones, which are surrounded by 3 forest buffer areas.

Such arrangement indirectly contributes to the sustainability of the padi culture of indigenous community of Kasepuhan Ciptagelar. Due to a stable water supply from its forest, although the population increased from 14,625 in 2008 to 19,918 in 2017, the average annual rice

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production between 2008 and 2017 was 374 tonnes higher than the average annual rice consumption in the same period. See Figure 7 for rice production and consumption in Kasepuhan Ciptagelar between 2008 and 2017. Furthermore, due to its strong padi culture, the rice stock of the community in 2017 was 45,710 tonnes. With the average annual rice consumption of around 4,384 tonnes, the community will be able to consume its rice stock for the next 10 years. Nonetheless, because the average annual rice production is higher than the average annual consumption, the community is expected to achieve an eternal food sovereignty. See Figure 8 for rice consumption and stock in Kasepuhan Ciptagelar between 2008 and 2017.

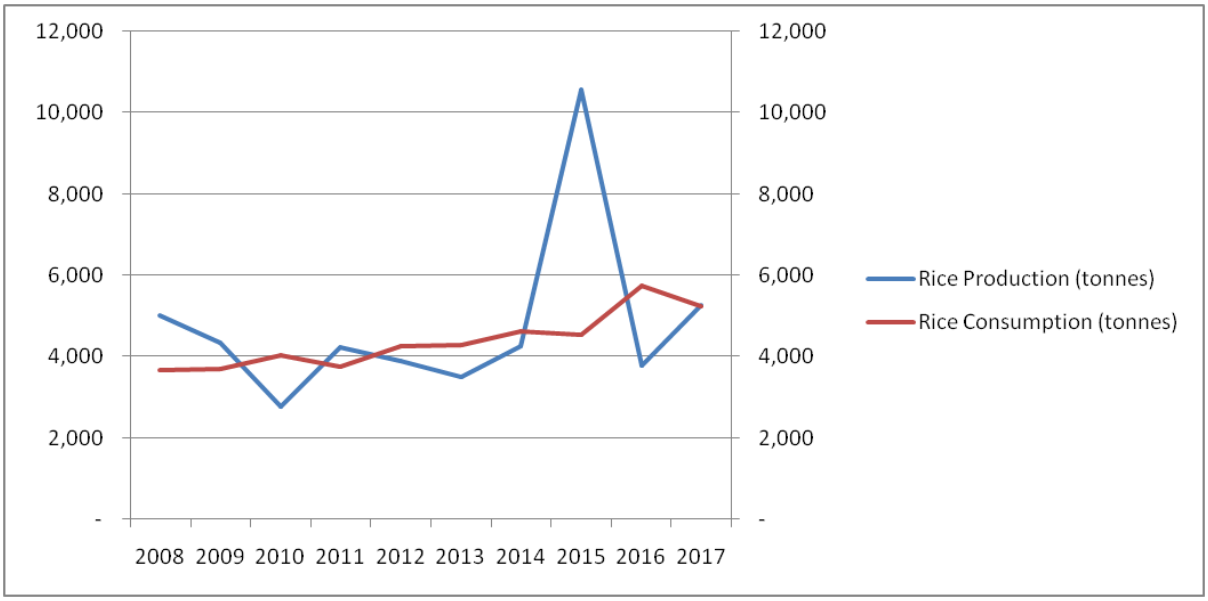

Figure 7 Rice production and consumption in Kasepuhan Ciptagelar between 2008 and 2017.

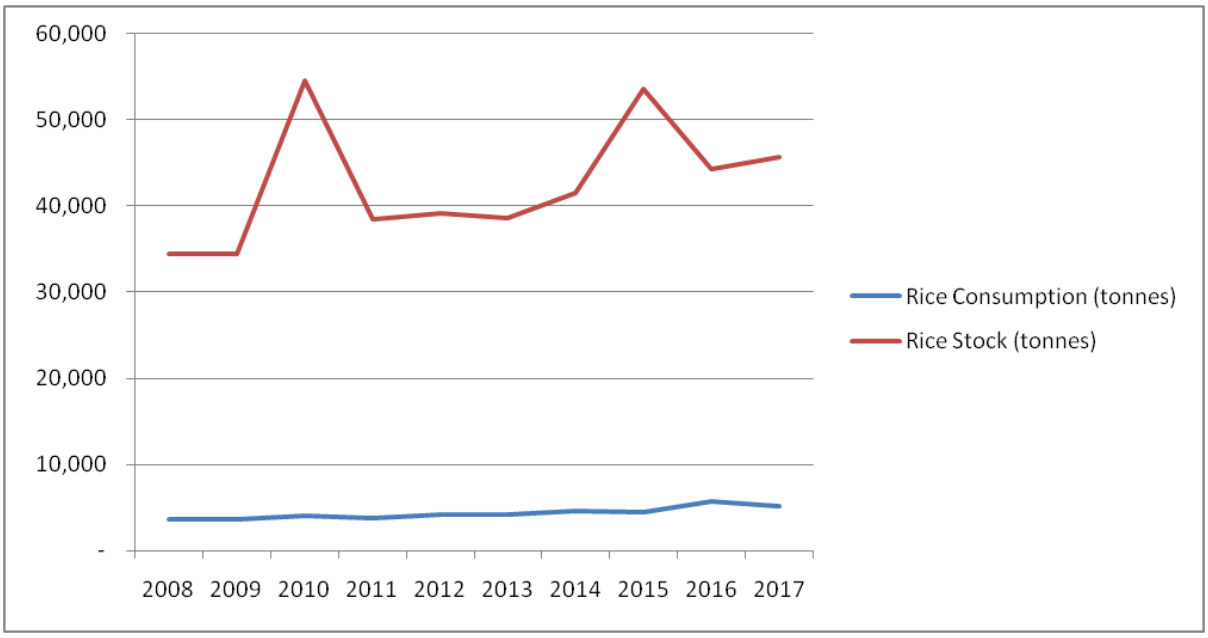

Figure 8 Rice consumption and stock in Kasepuhan Ciptagelar between 2008 and 2017.

 doi:10.20944/preprints202212.0402.v1

Most importantly, Kasepuhan Ciptagelar has been able to protect 4,000 hectares of forest. Having mapped the forest, Common Room (2017) concludes that 99% of the customary forest area was still in a very good condition.

In the case of *lompa* fish conservation area, such area is protecting the *lompa* fish from over-exploitation. *Lompa* fish lives in the estuary of Learisa Kayeli River but looks for food at sea at night (Kissya, 1987). Having protected the area, the annual catch of *lompa* fish in Haruku Village was 35 tonnes (Kissya, 1987).

Moreover, in *labuan* in the surrounding of Banda Sea, there are coral reef habitats, which act as nursery grounds for almost all species of tuna (World Wide Fund, 2011). This explains the abundant stock of tuna in Banda Sea (Marten et al., 1982). Such circumstance allows the fishermen in Latuhalat Village in the heart of Maluku Islands to acquire a monthly income between EUR 500 and 1,100, which is considerably above the poverty level in Indonesia (Abdulharis, 2014).

5. Discussion

5.1 Cultural Space Methodology Construct

As described in the Introduction, the cultural space methodology is a tool to identify, validate and verify authenticity of customary forest and conservation area by means of the interrelationship between indigenous community and the mentioned areas, which is mostly represented by indigenous knowledge. In order to serve such purpose, cultural space methodology was developed to facilitate a comprehensive assessment based on various interconnected domains.

The first domain is the evidence on the aforementioned interrelationship. This domain is used to identify the proof of such an interrelationship. In the Findings Section, it is described that the proof of the interrelationship exists in the form of (1) shared narratives, folklores and collective memories; (2) toponyms; (3) archaeological remains and natural objects and/or phenomena; and (4) social practices.

The employment of the aforementioned evidence on identifying the interrelationship between indigenous communities in Indonesia and their space suits the basic concept of cultural space. Time is embedded in space as the present is embedded in the cultural past and the future is embedded in the cultural present (St. Clair & Williams, 2008). Nonetheless, in the case of indigenous community of Kasepuhan Ciptagelar, the future is not only embedded in the cultural present but also in the cultural past. This is particularly because there exists shared narratives on the future functions of the forest.

In order to acquire the interrelationship between the indigenous community and their forest, as well as conservation areas, one or more evidence from above shall be collected for every smallest cultural space unit. Such evidence will also be utilised to lead to the identification ofcustomary administration system of forest and conservation area.

The second domain is the administration system of customary forest and conservation area. The objective of utilisation of this domain is to assess the existence of the administration of the aforementioned areas. Based on the findings from Kasepuhan Ciptagelar and Maluku Islands, the arrangement comprises of use, tenure and development of customary forest and

 doi:10.20944/preprints202212.0402.v1

conservation area. On the other hand, the valuation of the customary forest and conservation area is mainly related to social, economic and physical functions of the areas, particularly because the customary forest and conservation area hold intangible values for the studied communities. Furthermore, the administration of tenure, use and development of the customary forest and conservation area consists of several combinations of RRRs, which has been developed based on the social, economic and physical functions of the customary forest and conservation area.

As described in the Theory Section, evidence on interrelation among social, economic and environmental systems in the studied communities proves the importance of land administration concept on the construction of cultural space methodology. Interrelationship between the communities and their spaces allows the communities to socially and economically benefit from available resources in their territory. Furthermore, as also described in the Theory Section, land administration system regulates RRRs on tenure, use and development of customary forest and conservation area. In the case of the interrelationship between the studied communities and customary forest and conservation area, the above RRRs are represented by indigenous knowledge. This is because the communities expect long-term benefits from their territories, the communities develop space administration system and enhance the system over time for regulating social conducts over the space toward a sustainable social, economic and environmental system. This is in accordance with land administration concept, which is developed based on the interrelation between people and space, as describe in the section on cultural space methodology construct. Therefore, this domain can assess the authenticity of customary forest and conservation area by means of indigenous knowledge on the administration of the mentioned areas.

In order to assess the presence of the administration system of customary forest and conservation area, the existence of types of tenure and/or use and development permit should be identified first. In the customary forest of Kasepuhan Ciptagelar, forest reserve acts as a use and development permit, which is also considered as a type of customary forest besides the buffer zone. In Maluku Islands, *labuan* also acts as a tenure, as well as a use and development permit. The eligible subject of these tenure and use and development permits is the indigenous community itself, which is represented by the customary government in the area in question.

Furthermore, the identification of RRRs concerning every type of tenure and/or use and development is expected to be carried out to assess the authenticity of the customary forest and conservation area by means of this first domain. From the RRRs of the customary forest of Kasepuhan Ciptagelar, it can be concluded that the forest is expected to be sustained by limiting the exploitation of its various resources for customary purposes only. The outcomes of the application of the RRRs have been identified, such as less anthropogenic pressure to the forest, which allows the forest to be sustained. While the economic benefit from the forest management can only be enjoyed by the indigenous community of Kasepuhan Ciptagelar as an institution but not directly for its members, the application of the RRRs has sustained the indigenous knowledge on the administration of the indigenous community’s customary forest.

In Maluku Islands, RRRs have also been regulated in the administration of *labuan* and other types of in-shore conservation area such as *lompa* fish conservation area. *Labuan* is allowed to be continuously explored and exploited using strict rules. On the other hand, *lompa* fish

 doi:10.20944/preprints202212.0402.v1

conservation area can only be exploited at a designated period. The application of RRRs in both areas not only allows the physical environment to be sustained but also provide economic benefits for the members of the indigenous community in question. Most importantly, as occurred in Kasepuhan Ciptagelar, the application of RRRs has ensured the sustenance of indigenous knowledge on the administration of the customary conservation area.

The third domain is social, economic and physical functions of the customary forest and conservation area. The social, economic and physical functions of the area is assessed to identify the existing interests on the administration of customary forest and conservation area, as well as their outcomes and impacts.

As described in the Findings Section, although each case study area has different social, economic and physical settings, the indigenous communities have been economically benefiting from environmental services, particularly due to the sustainability of the carrying capacity of the customary forest and conservation areas. Therefore, forest and conservation area hold intangible value for the communities, which provides a basis for these communities to protect forest and conservation area. Moreover, as the sustainability of the customary forest and conservation areas has been maintained by means of indigenous knowledge applied in the customary forest and conservation area, it reflects the sustainability of the social system of the communities as well.

To identify the interrelationship between indigenous community and their forest and conservation area by means of the third domain, evidence concerning the social, economic and physical functions of the customary forest and conservation area for indigenous community shall be collected. Most importantly, the interrelationship can only be identified if the aforementioned functions are correlated one to another.

From the physical or environmental points of view, the evidence may be collected in the form of spatial data on cultural space unit, as well as the cultural space unit components and the condition of the unit in question, from various periods. In the territory of the indigenous community of Kasepuhan Ciptagelar, the latest map of its customary forest and the shared narration on the boundary of the forest reveal that the forest and its components are still in good condition. Having analysed such circumstance by considering the existence and the effectiveness of the customary forest administration system, it can be concluded that the social system of the indigenous community of Kasepuhan Ciptagelar is suitable and well-functioning to maintain the condition of the forest.

Furthermore, evidence on the economic function of the customary forest and conservation area may also describe a clear link between the indigenous community and the forest and/or conservation area. As explained in the Findings Section, the agricultural system of the indigenous community of Kasepuhan Ciptagelar has been benefiting from the sustainability of the forest. The constant supply of water during the padi season has been crucial to ensure the padi production of this community. Such fact also provides a solid proof that the social system of the community has been able to sustain the economic function of the forest.

In Maluku Islands, the customary marine conservation areas have been maintained by the indigenous communities. By putting in mind the income of the fishermen in the islands, it can be concluded that the economic system of the indigenous community has been benefiting from the sustainability of the conservation areas. While the physical function of the

 doi:10.20944/preprints202212.0402.v1

customary marine conservation areas has been maintained by the customary laws, it was concluded that the social system functions well to sustain the physical and economic functions of the customary conservation areas and the region in general.

5.2 Cultural Space Unit

Of the important features that is assessed on the application of cultural space methodology is geospatial data on cultural space. Geospatial data includes information on geographic feature's attributes and operations, as well as its associations with other geographic features, for either the same or different feature types (International Organization for Standardization, 2005). Geographic feature is an abstraction of real-world phenomenon associated with a location relative to the Earth (International Organization for Standardization, 2005).

Cultural space is considered a geographic feature, which acts as the core of application of cultural space methodology. Attributes of cultural space may include shared narratives, folklores and collective memories, as well as social, economic and physical functions. Cultural space may also store information on indigenous knowledge that is exercised in such space. The space is uniquely identified by its toponym. Cultural space may also have an association with other cultural spaces or other geographic features, such as archaeological remains and natural objects and/or phenomena, while the information on social practices may be stored in the form of geographic feature's operation.

On the assessment of authenticity of indigenous community's forest and conservation area, the location and coverage of cultural space act as important attributes of such space. As described earlier, cultural space is an accumulation of social activities in space over time. Furthermore, as described in the previous sections, different activities may be performed in every cultural space. Therefore, delineation of cultural space is crucial to identify specific activity that is performed in such space, as well as particular indigenous knowledge that is exercised in the operation of such activity, as well as social, economic and physical impacts of the activity. In the cultural space methodology, the delineated cultural space, known as the cultural space unit, is expected to be the geographic feature that is verified and validated as the feature contains all information concerning the interrelation among indigenous communities, their indigenous knowledge and their forests and conservation areas.

To define a cultural space unit, it requires an in-depth interpretation of every indicator of the aforementioned interrelationship. Cultural space is classified as a phenomenon in geographic reality as it does not represent a single geographic feature but the interrelationship itself. An in-depth interpretation of shared narratives, folklores and collective memories may result in an indication of location and coverage of a cultural space unit, as well as its function, particularly the social one. The above information may also provide linkages to toponym, archaeological remains and natural objects and/or phenomena, which is normally utilised to acquire the exact location and coverage of the unit in question. The information that is employed to perform an in-depth analysis on shared narratives, folklores and collective memories may be collected by interviews and/or Focus Group Discussions (FGDs). The exact location and coverage of cultural space unit may be acquired either by field observation or cartometric method.

Moreover, an in-depth interpretation of shared narratives, folklores and collective memories may also be employed to acquire the principles of development of indigenous knowledge and space administration system. On the other hand, an in-depth interpretation of space

 doi:10.20944/preprints202212.0402.v1

administration system may result in information on indigenous knowledge that is exercised in the unit in question.

In order to acquire information on social practices and space administration system, it normally requires data collection and analysis process. The methods that are normally employed on data collection are interviews, FGDs and/or field observation. In the scope of application of cultural space methodology on defining a cultural space unit, analysis of the collected data may be done by considering the basic concept of cultural space and land administration.

In particular, to obtain the information about economic and physical functions of cultural space unit, data collection and analysis are also required. Data that is expected to be collected vary depending on the characteristics of the cultural space unit. Generally, various base- and thematic maps, as well as demographic and economic data, are required to be analysed to acquire information on economic and physical functions of cultural space unit. Furthermore, to attain such information, data collection and analysis on a larger coverage than the coverage of cultural space unit and, even indigenous community's territory, is required. This is mainly because the existence of association among cultural space units, as well as cultural space unit in forest and conservation area, may provide support on the sustenance of carrying capacity of other cultural space unit outside forest and conservation area.

6. Conclusion

Throughout this paper, the premises stated in the Introduction Section on the importance of the cultural space methodology to maintain social, economic and environmental sustainability of the customary forest and conservation area has been proven. Moreover, in the Discussion Section, the construction of the methodology based on the facts revealed in the Findings Section is explained.

On the objectives of the delivery of social forestry in general and particularly in Indonesia, the cultural space methodology may be able to identify factors that lead to the enhancement of people's welfare and to the maintenance of the environmental carrying capacity. As described in the Findings Section, the sustainability of the customary forest and conservation area is identified from their current physical functions, which directly contributes to the sustenance of the economic system of agriculture and maritime indigenous communities of Kasepuhan Ciptagelar and in the Province of Maluku. The sustainability of the economic system of these communities is identified from data on the production or people's income. Most importantly, the sustainability of the aforementioned systems was preserved by means of a robust social system of these communities. The sustainability of the social system is proven by the existence of the customary forest and conservation area administration system. The evidence on the presence of the administration system is the existing knowledge, practices and/or objects of the relationship.

To identify the interests on management of the customary forest and conservation area, the cultural space methodology may be utilised by means of the outcomes of the social, economic and physical development, as well as by identifying the existence of the customary forest and conservation area administration system. Due to the significance of the customary forest and conservation area in Kasepuhan Ciptagelar and the Province of Maluku on ensuring the sustainability of the economic system of these communities, these areas hold both intangible and tangible values for the communities. The administration systems of the

 doi:10.20944/preprints202212.0402.v1

customary forest and conservation area of these communities were developed to preserve the such values. On the other hand, the methodology may also be used to identify the interests that differ from the objectives of the delivery of the social forestry. Based on the fact that the sustainability of the environmental carrying capacity is maintained by the social system, which contributes to the sustenance of the economic system, the interests that are not in accordance with the objectives of the delivery of the social forestry may be detected using cultural space methodology. Power imbalance and marginalization of less powerful actors may also be identified by analysing the extent of the administration system coverage and the number of the beneficiaries affected by the system, as well as social, economic and physical functions and the outcomes of the customary forest and conservation area management.

The past, current and future outcomes of the management of the customary forest and conservation area may also be identified or predicted using the methodology. The past outcomes may be analysed from the knowledge of the relationship between the community in question and the customary forest and conservation area, while the current outcomes may be examined from the data on production and/or people's income. Furthermore, by quantifying the environmental carrying capacity and the population projection, as well as the knowledge of the relationship, the future outcomes of the management of the customary forest and conservation area may be predicted. The latter is possible because, as stated in the Discussion Section, the future is also embedded in the cultural past and present.

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