

## **Diversity of Cultural Landscape and Potency of Sustainable Tourism Development in Rural Area of Lombok Island, Indonesia**

Slamet Mardiyanto Rahayu<sup>1</sup>, Luchman Hakim<sup>2</sup>, Jati Batoro<sup>3</sup>, Kurniasih Sukenti<sup>4</sup>

### **Abstract**

*Interaction between humans, nature, and culture creates a cultural landscape that provides various benefits. The pressure and threat to the existence of the cultural landscape is getting higher. This study aims to identify and analyze the diversity of cultural landscapes and determine potency of sustainable tourism development based on cultural landscape in rural area of Lombok Island, Indonesia. The area inhabited by the Sasak tribe is a rural area with distinctive pattern of spatial organization. Kinds of cultural landscapes observed in this research are ricefield (bangket), settlement (gubuk) and homegarden (leah), meadow (gumi pupak), garden (kebon), and forest (gawah) and sacred area (simbit). Research findings indicate that the cultural landscape of the Sasak tribe in rural of Lombok Island is the traditional settlements that are built and depend on the biodiversity and its environment. Sasak people in rural of Lombok Island still maintain the cultural traditions. Through their involvement in this area, Sasak people can carry out the preservation of their cultural landscape. The development of cultural landscape as sustainable tourism can play an important role in preserving regional cultural values as a national cultural asset, preserving plant diversity and landscape, and improving the welfare of local communities.*

**Keywords:** *Livelihood, Local Community, Sasak Tribe, Village, Traditional Settlement.*

### **Introduction**

The interaction between community and the natural environment creates a cultural landscape. Cultural landscapes have become an essential topic of rural studies worldwide (Shen and Chou, 2021). The setting of the cultural landscape is shaped by human society and nature, representing an essential storehouse of natural and human cultural resources. This setting is a place for people to perform their activities in the environment to produce socio-cultural, economic, and ecological configurations. Cultural landscapes sometimes called rural landscapes, are the most modified by humans (Farina, 2000). Rural landscape is a system consisting a human, nature, and culture (Yang et al., 2018). Rural landscapes are diverse and related to local natural resources, political and economic policies, social structures, and cultural awareness (Wu et al., 2020). The rural landscape is a continuous cultural landscape. Rural landscapes around the world represent cultures and cultural

---

<sup>1</sup> Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Islam Al-Azhar, Mataram, West Nusa Tenggara, Indonesia; Doctoral Program in Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, East Java, Indonesia. E-mail: slamet.mardiyantorahayu84@gmail.com

<sup>2</sup> Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, East Java, Indonesia. E-mail: luchman@ub.ac.id

<sup>3</sup> Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, East Java, Indonesia. E-mail: jati\_batoro@yahoo.com

<sup>4</sup> Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Mataram, Mataram, West Nusa Tenggara, Indonesia. E-mail: kurniasihukenti@yahoo.com

traditions. Rural landscapes provide economic and social benefits, multifunctional, cultural supports, and ecosystem services for people (Ashrafi and Shokrani, 2018).

Today, many cultural landscapes are under threat (Rossler and Lin, 2018). Pressures and threats to the existence of cultural landscapes are getting higher, including rapid development, conversion of cultural landscapes into other forms of use, deforestation, exploitation of natural resources, socio-ecological changes, loss of components of the cultural landscape, decreasing of the younger generation understanding and appreciation of the cultural landscape, and loss of knowledge about the biological component in cultural landscape (Jung and Ryu, 2015; Rahmi and Setiawan, 2021; Pora et al., 2022).

Indonesia is an archipelago country with a high level of diversity in term of biodiversity, cultural diversity, and diversity of landscape visual characters. These diversities are connected to one another and give tropical Indonesian traditional landscape (Gunawan et al., 2019). Indonesia is archipelagic country consisting of many tribes in Southeast Asia (Arif, 2019; Frederick and Worden, 2011). Sasak is the original tribe of Lombok Island, West Nusa Tenggara, Indonesia (Sukenti et al., 2019). Most Sasak people live in villages, predominantly Sasak or in mixed communities (Sukenti et al., 2016). Lombok Island is home to numerous tourist attractions (Sunarta et al., 2022), like Mandalika. One of a nation's pillars of economic growth is tourism (Ismail, 2021). The Government of the Republic of Indonesia established the Mandalika Special Economic Zone (MSEZ) based on the Government Regulation of the Republic of Indonesia No. 52 of 2014. MSEZ has an area of 1,035.67 ha and is located in Pujut District, Central Lombok Regency, West Nusa Tenggara Province (Government of the Republic of Indonesia, 2014). Today, Indonesia's leading development is the tourism industry's growth. As a result, the development of the tourism sector extends to the countryside (Untari and Suharto, 2020), such as villages around Mandalika, Lombok Island. Sasak people have inhabited the villages around MSEZ for hundreds of years and interacted with the natural environment to form a cultural landscape. Massive development occurred in MSEZ. The construction of various tourism-supporting facilities has also occurred around the MSEZ; it affects the cultural landscape of the Sasak people, including slope erosion, loss of soil and habitat, which will have an impact on reducing biodiversity.

Although Indonesia is home to many landscapes, the term "cultural landscape" is rarely mentioned in academic literature. As a result, it is difficult to get literature and knowledge about Indonesian cultural landscapes. Concerns about Indonesian cultural landscape diversity and protection are important (Hakim, 2011). The rapid loss of biodiversity due to habitat degradation and over-exploitation has made conservation priority (Singh and Samant, 2010). Cultural landscapes are homes and habitats for millions of people (Hakim, 2017). Therefore, there is a need for identification as an initial effort in cultural landscape preservation programs and sustainable tourism development.

Creating a tourism product in a cultural landscape is difficult unless scientific information about the object is available (Hakim, 2017). Until now there has been no research about the cultural landscape and the potency of sustainable tourism based on cultural landscape in rural around Mandalika, Lombok Island. Therefore, it is necessary to carry out this research which aims to identify and analyze the diversity of cultural landscapes and determine potency of sustainable tourism development based on cultural landscape in rural area around Mandalika, Lombok Island, Indonesia.

## Research Methods

### Study area

This study was conducted in some villages around Mandalika, namely: Sengkol, Kuta, Mertak, and Sukadana Villages, Pujut District, Central Lombok Regency (Figure 1). Pujut is the most expansive district in Central Lombok Regency, has an area of 23,355 ha or

occupying about 19.33% area of Central Lombok Regency (The Central Bureau of Statistics for Central Lombok Regency, 2022). Geographically, Pujut is located at the southern part of Central Lombok Regency which is a hilly area and bordered with Indian Ocean. Therefore, there are many marine tourism objects situated in this area.

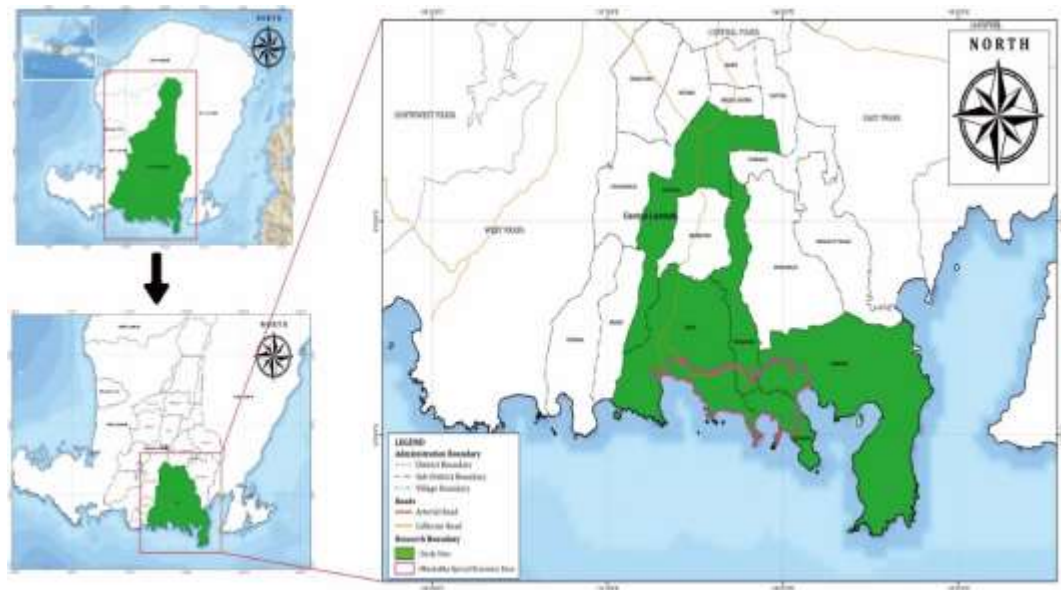


Figure 1. Map of the study area

#### Field survey

Identification of rural cultural landscapes is carried out through exploratory methods by conducting field observations. Observation is used as a data collection technique by systematically recording research objects. Field observations were made to obtain a direct picture of the physical conditions, spatial patterns, and architecture. Identification of plants in the cultural landscape refers to several identification books (Van Steenis, 2008; Henderson, 2009; Setyawati et al., 2015). Scientific name of plant is based on International Plant Names Index (2023). Altitude determination using Garmin Etrex GPS. Testing soil texture with the hydrometer method at the Soil Physics Laboratory, Faculty of Agriculture, University of Mataram. Interviews were conducted with traditional leaders, community leaders and the local community to obtain further information and to verify the results of observations about the cultural landscape.

#### Data analysis

Data of Cultural landscape altitude and soil texture are shown in pictures. All of these data along with the results of the interviews were then analyzed using descriptive and qualitative approaches. Thus, the understanding about the diversity of cultural landscape and potency of sustainable tourism development based on cultural landscape in rural area around Mandalika, Lombok Island can be interpreted comprehensively.

### Findings and Discussion

The area inhabited by Sasak tribe around Mandalika is a rural area with distinctive pattern of spatial organization. Atik and Erdogan (2017) stated spatial patterns of cultural landscapes are the product of long-term interactions between humans and nature in an area. The order of the cultural landscape is composed of the interweaving of the traditional norms of people's daily life which are formed as a manifestation of the expertise and creative abilities of the ancestors in the traditional landscape and architectural environment (Setijanti et al., 2015). According to Igit et al. (2017) that regarding economic, social, demographic, and cultural development, rural areas are areas that differ from other areas.

The spatial organization pattern of the Sasak tribe cultural landscape can be seen from the unity of cultural landscape consisting of ricefield (bangket), settlement (gubuk) and homegarden (leah), meadow (gumi pupak), garden (kebon), and forest (gawah) and sacred area (simbit), as seen in Figure 2.

Cultural landscapes frequently demonstrate particular methods of sustainable land use, taking into account the qualities and constraints of the natural environment they are established in as well as a particular spiritual relationship to nature. The preservation of cultural landscapes can contribute to current methods of sustainable land use and can preserve or improve the landscape's natural values. In many parts of the world, biological diversity is supported by the persistence of traditional land-use practices. Therefore, UNESCO (2008) stated preserving traditional cultural landscapes is beneficial for preserving biological diversity. The characteristics of the cultural landscape are related to environmental abiotic factors, for example: altitude and soil texture. This is related to plant species that grow in cultural landscapes and are used by the community. Altitude and latitude affect the ambient temperature. Thus, affecting the earth's vegetation, including plants that grow in the landscape. The vegetation in an area is a sensitive indicator of the local climate. The area around the equator receives sunlight all year round with low temperature fluctuations and tends to be stable. Such conditions allow various plant species to live comfortably and form a plant society that is rich in species and varieties (Hakim, 2014). The Sasak tribe community around Mandalika, Lombok Island utilizes land according to the altitude of the place (Figure 2) so that various cultural landscape units are grown by different plant species and are used to meet their daily needs.

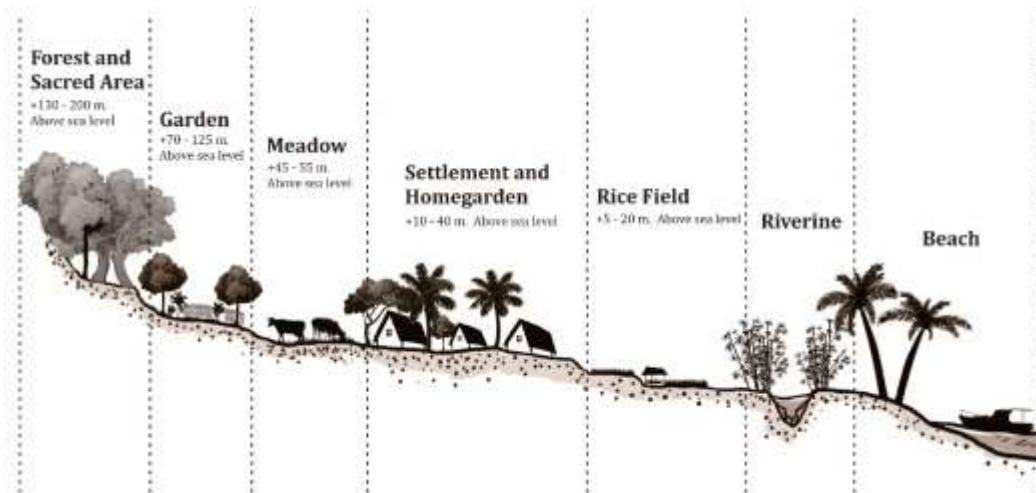


Figure 2. Various cultural landscape in rural area around Mandalika, Lombok Island  
Ricefield (Bangket)

The majority of Indonesian people rely heavily on the agricultural sector as an economic activity (Setyowati et al., 2023), including in Lombok Island. Predominantly, the Sasak people are farmers. Ricefield are landscapes used for growing rice and other food crops (Figure 3). Ricefields in rural area around Mandalika, Lombok Island are rain-fed rice fields. The ricefield get irrigation from rainwater and from smallscale reservoir during the dry season. The soil in the ricefield has a clay loam texture, making it suitable for growing rice. This is in accordance with Safitri et al. (2021) that clay loam is suitable soil texture for cultivating rice plant (*Oryza sativa* L.). Lehmann and Stahr (2010) stated the optimal soil texture for lowland rice is a smooth texture with low porosity so that the soil density is high. Fine textures such as clay and loam are textures that store a lot of nutrients and provide sufficient water content. The ricefields (bangket) around Mandalika are rainfed, usually planted with rice plant (*O. sativa* L.) once a year. In dry season, Sasak people plant drought-resistant crops, such as tobacco (*Nicotiana tabacum* L.) and chilli (*Capsicum*

frutescens L.). The ricefield boundaries are marked by presence of *Sesbania grandiflora* (L.) Pers.

Through the years and within a cultural environment that is becoming more anthropocentric, humans have been able to modify the land nearby for their own survival. Since the beginning of time, mankind has created methods to meet their basic needs, primarily the production of food to support society. As a result, agricultural systems have been developed that are adapted to the geographical environment in which they are located, to meet needs and the sustainable use of resources. Traditional agricultural systems have historically been used by communities as a means of subsistence because of their effective management and respect for the land's surroundings (Tarolli et al., 2019). Traditionally, community farming has been done through cultivation, covering methods, production, post-harvest, and use (Batoro, 2021).



Figure 3. Diversity of cultural landscape in rural area around Mandalika, Lombok island: (a). simbit (sacred area), (b) gawah (forest), (c) kebon (garden), (d) gumi pupak (meadow), (e) gubuk (settlement) and leah (homegarden), (f) bangket (ricefield)

Indonesia is still mostly an agricultural nation where dryland farming is the main form of sustenance (Rejekiningrum et al., 2022), such as in rural area around Mandalika, Lombok Island. The dryland cropping index, which is often only cultivated during the rainy season

(December-April), can be raised by combining more irrigation, water-saving techniques, and on-site water collection innovations (Rejkeningrum et al., 2022), such as small-scale reservoir. The Sasak people constructed a small-scale reservoir called mbung in the ricefield. Mbung means a place to store water. According to Saadi (2013), the term mbung was later adopted in Indonesian to become embung. The term embung has been used in many water resource project schemes outside Lombok Island. Mbung is a small rainwater reservoir known on Lombok Island and has been used for 700 years ago. The existence of mbung is essential in the history and development of agriculture (Saadi, 2013), especially in the dryland of Lombok Island, like rural area around Mandalika.

#### Settlement (Gubuk) and homegarden (Leah)

A rural settlement is a place where people live and work that is created by interactions between rural residents and the environmental, socioeconomic and cultural environments nearby (Feng and Long, 2020). The settlements of the Sasak people are in flat areas. At the beginning of the formation of the village, the settlement was built on a flat area surrounded by agricultural land. The arrangement of clusters in villages around Mandalika is a centralized pattern. Several hamlets form the cluster pattern of village. A hamlet leader leads each hamlet. Mayasari et al. (2023) stated that the harmonious interaction between humans, nature, and culture in a settlement with a distinctive order creates the concept of a cultural landscape.

The house of the Sasak people is called bale. Most bale has traditional buildings, namely: berugaq and lumbung, located in the front of bale. Berugaq is a traditional building with a stage concept and is separated from the main house (bale). Berugaq usually serves as a place to receive guests. Most Sasak people's houses have a granary, called lumbung, located outside, and separated from the bale. Lumbung serves to store the harvest. Berugaq and lumbung are made of natural materials: bamboo (*Bambusa vulgaris* Schrad.), weeds (*Imperata cylindrica* (L.) Raeusch.), and wood (*Cocos nucifera* L.). Howard and Pinder (2003) stated traditional buildings were developed as a response to climatic, cultural, and social demands in order to produce comfortable places and make use of natural resources. Traditional buildings support the fundamental components of sustainability, including social justice, support the sense of belonging of the community, environmental protection, and environmental conservation (Salameh et al., 2022). In their freetime, Sasak woman make woven cloth in outside of the house. Seseq (weaving) is a skill that must be possessed by Sasak women. A Sasak women can not marry before she can weave cloth. Woven cloth is used in various traditional Sasak ceremonies. Various cultural traditions, such as: the Peraq Api ritual, Sorong Serah Ajikrame, and others are carried out in the outside of the house. Mibtadin et al. (2023) stated tradition, culture and religion play an important role in uniting village communities and fostering social harmony based on shared values.

In settlement landscapes, between one house (bale) and another is used as a homegarden (leah) with plant species such as ornamental plants as well as vegetables and fruit, as seen in Figure 3. Soil texture in homegarden are loam and sandy loam. Homegarden has many important roles. Homegardens are widely researched to answer various global issues, ranging from climates changes mitigation, wildlife conservation, food security and community health. Home gardens conservation support Sustainable Development Goals (SDGs) achievements. The arrangement of leah makes diverse plant species live there. Plants in leah show an essential role the leah plays in the life of its owner. Leah is influenced by local knowledge of the Sasak tribe on managing the space around the bale. According to Abdoellah et al. (2020) homegarden is described as a deliberately managed, intensely maintained land-use agricultural system that includes multipurpose plants and livestock within individual residences. Homegarden is a family-managed microenvironment that frequently exhibits high levels of species diversity. It is carefully tended, well-delimited by a fence or hedge (Khanal et al., 2019). Homegardens are the most interesting cultural landscapes in tropical areas. Homegarden is the harbour of numerous plant species planted to provide food, medical material, aesthetics, social, and other functions. The physical

aspect of the environment and human socio-culture lead homegardens to have diversity in a plant structure (Rahu et al., 2013; Solossa et al., 2013). The homegarden is a component of the traditional settlement (Hakim, 2017).

The Sasak people plant various plants in their homegarden (leah). These plants have specific functions in cultural traditions, consumption, ornamental plant, medicinal, and other useful plants. Plants used for cultural traditions, such as: *Areca catechu* L., *Plumeria alba* L. *Ziziphus mauritiana* Lam. Plants used for consumption, such as: *Carica papaya* L., *Cocos nucifera* L., and *Mangifera indica* L. Plants grown for ornamental purposes are known for their colorful flowers and leaves, such as: *Euphorbia milii* Des Moul., *Dyopsis lutescens* (H.Wendl.) Beentje & J.Dransf, and *Syzygium myrtifolium* Walp. According to Rocha et al. (2022) ornamental plants are used in a variety of settings and circumstances, in landscaping, and in various green spaces, greatly enhancing rural living quality. Ornamental plants can be part of cultural landscape (Janecek et al., 2019). Plants used for medicinal, such as: *Kaempferia galanga* L. and *Zingiber officinale* Roscoe.

#### Meadow (Gumi pupak)

The meadow landscape is covered with forage plant species and is a grazing area, as seen in Figure 3. Soil texture in meadow are clay loam, loam, and sandy clay. Aside from being farmers, the Sasak people raise livestock. According to Maestre et al. (2022) livestock production has a significant impact on food security, the local economy, biodiversity, and biogeochemical cycles. Globally, ruminants such as cows, buffaloes, and goats are widely cultivated herbivores (Ickowicz and Moulin, 2023). Cows are used by farmers to plow bangket (ricefield) and cow dung as fertilizer. Cows are also useful as saving especially in the famine (paceklik). During the day, the Sasak people graze their livestock in the meadow landscape. The plant species that grow in the meadow landscape are *Cynodon dactylon* (L.) Pers., *Chloris barbata* Sw., and *Calotropis gigantea* (L.) Dryand. The Sasak people refer to the grassland landscape as gumi pupak. This landscape is managed traditionally. According to Babai et al. (2021), traditional management systems are responsible for creating and maintaining cultural landscapes. Eriksson (2022) stated that meadow landscapes represent cultural heritage and are appreciated for their beauty.

#### Garden (Kebon)

The garden landscape is located some distance from the people's homes and is used to grow food crops and other crops of economic value, as seen in Figure 3. Soil texture in garden are clay loam and sandy loam. Plants that are widely planted in the garden (kebon) include coconut (*Cocos nucifera* L.), banana (*Musa*), weeds (*Imperata cylindrica* (L.) Raeusch.), and elephant grass (*Pennisetum purpureum* Schumach.). Gardens in rural area around Mandalika, Lombok Island are widely used by Sasak people to cultivate coconuts (*C.nucifera* L.), and the cultivation area is called kebon nyiur (coconut garden). According to Sathyaseelan and Ravi (2022) that coconut may be grown in a wide range of soil types, from pure sand to clay and sandy loam. Directorate General of Estate Crops (2018) stated that in the economic, social, and cultural lives of many people in Indonesia, the coconut (*C.nucifera* L.) plays a significant part. Coconut is one of the important palm crops in Indonesia which is mostly owned by smallholders (Alouw and Wulandari, 2020). Coconuts, a significant plantation crop, are farmed in coastal regions and plains (Hebbar et al., 2022), such as in rural area around Mandalika, Lombok Island. Coconut is used to make coconut oil, while the shells are utilized as charcoal, while coconut leaves are used to produce brooms, and wood is utilized as building material.

#### Forest (Gawah) and sacred area (Simbit)

The forest landscape is at a higher altitude and is covered with a high density of trees, as seen in Figure 3. Rural area around Mandalika, Lombok Island have forests, including: Kamal Muluk Forest in Sukadana Village, Gunung Tunak Forest in Mertak Village, Gunung Pujut Forest in Sengkol Village, and Gunung Prabu Forest in Kuta Village. The

Sasak people consider the forest as a sacred area. The sacred area in the Sasak language is called simbit. There are also sacred areas at the top of the hill, for example: Gunung Pujut Ancient Mosque which is an archaeological site, as seen in Figure 3. According to Sullivan and Mackay (2012) archaeological site is a spot (or locus) where remnants of human activity from the past can be found, encompassing elements or components with cultural heritage value, where archaeology has contributed to the discovery, recognition, and/or research of these cultural values. Simbit is an area that has crucial spiritual meaning for the Sasak community. Simbit can be an important reference place that shows the cultural identity of Sasak community. Gunung Pujut Hill in Sengkol Village, for instance. At the top of Gunung Pujut Hill is an ancient mosque, a cultural heritage. According to Nilson and Thorell (2018), UNESCO defined cultural heritage is the legacy of tangible artifacts and intangible characteristics of a group or culture that are passed down from previous generations, preserved in the present, and given for the benefit of following generations. The older structures, particularly those that have been classified as cultural heritage monuments, are incredibly prone to harm (Rilatupa and Mangani, 2020), such as Gunung Pujut Ancient Mosque, so it is need to be preserved.

The roof of Gunung Pujut Ancient Mosque is made of *Imperata cylindrica* (L.) Raeusch. leaves and the walls are made of bamboo woven (*Bambusa vulgaris* Schrad.). Around the Gunung Pujut Ancient Mosque is a sacred area. There is a place of worship (pedewa). Ceremonies related to Moslem are carried out in mosque led by a religious leader (kyai). In comparison, the ancestral spirit worship ritual is led by traditional leader (mangku). Traditional leaders are believed to have succeeded in connecting the living with the spirit of their ancestors in the past. At the worship area (pedewa), many *Plumeria* trees are found.

Forest landscapes and sacred areas are guarded by the Sasak people, Lombok Island. Trees in the forest should not be cut down carelessly. This shows the existence of local wisdom in protecting the natural environment, including the preservation of the plants in it. The soil texture in forest are sandy loam and sandy clay loam. Forests in rural area around Mandalika, Lombok Island are overgrown with woody trees, such as: kukun (*Schoutenia ovata* Korth.), kesambik (*Schleichera oleosa* (Lour.) Oken), and Perek (*Streblus asper* Lour.).

Cultural landscape may contain both natural and cultural areas (Altaba et al., 2022). Research findings indicate that the cultural landscape of the Sasak tribe in rural area around Mandalika, Lombok Island is the traditional settlements that are built and depend on the biodiversity and its environment. According to Budiono et al. (2005), the traditional settlement is an area with cultural significance seen from one, part, or all aspects, namely: architectural aspects of buildings and the environment, aspects of social institutions (traditional rituals, social organization, and other local social identities) and aspects of cultural arts. Traditional settlements are built by communities taking into account the socio-cultural background and natural environment, are places of livelihood and reflect the close relationship between society and nature (He et al., 2019).

Potency of Sustainable tourism development based on cultural landscape in rural area, Lombok Island, Indonesia

Cultural landscapes are landscapes created by human actions and cultural structures in physical settings. Adhika et al. (2020) stated cultural landscapes play an important role in sustainable tourism. Sustainable tourism includes sustainable society, economy, environment, and culture (Pan et al., 2018). Cultural landscapes are attractive tourism resources for three reasons. First, the unique vegetation structure and composition plays a role as an object of interest in the development of quality tourism products. Second, the extraordinary appearance of the physical environment gives the landscape uniqueness. Third, there are cultural attributes as an attraction, for example: traditional lifestyles, local customs, festivals and the arts (Hakim, 2017). The development of cultural landscape as sustainable tourism can play an important role in preserving regional cultural values as a



national cultural asset, preserving plant diversity and landscape, and improving the welfare of local communities.

Promotional activities must be intensified so that the potential for sustainable tourism based on cultural landscape can be developed and has positive benefits for science, the tourism industry, culture, landscape, and the welfare of people in rural area around Mandalika, Lombok Island. Tour packages that can be developed include visiting diversity of cultural landscapes (ricefield, settlement and homegarden, meadow, garden, forest and sacred area), practicing preparing plants to be used in ritual, and planting and caring for these plants. Tourists can have the experience of participating in ritual, traditional ceremony, farming, raising and herding livestock, as well as other daily activities carried out by Sasak people in Lombok Island.

Numerous plant species found in cultural landscapes of rural area around Mandalika, Lombok Island, have the potential to contribute in tourism development. Innovations in the form of a combination of tourism and agriculture can be carried out (Santiago and Buot, 2018), such as gardening activities in cultural landscape of rural area around Mandalika, Lombok Island. From the perspective of tourist attractions and destinations, homegarden management is important. Homegarden plays a significant role in tourism development, specifically: related to efforts to improve the quality of the environment, homegarden role as an educational setting, and homegarden provides a lot of materials for tourism needs. The number of plants with aesthetic value (ornamental plants) that enhance the landscape beauty is related to the homegarden contribution to environmental quality. Diversity and unique character of plant species is an interesting object for education, that is important in conservation programs. This is beneficial for the development of ecotourism. Homegarden is full of fruit, vegetables and others that usually served in local dishes. It plays a role in development of culinary tourism using local ingredients (Alelang et al., 2018). The use of plants in ritual activities among the Sasak people in rural area around Mandalika, Lombok Island also has the potential to become a tourism commodity. This is in accordance with Hong et al. (2018) and Izzah et al. (2021), which stated that community ritual activities can become tourism commodities. The use of plants as handicraft materials also plays a role in tourism development in rural area around Mandalika, Lombok Island. Tourists can see and have direct experience in making the handicrafts. Handicrafts based on plants can also be sold to tourists so that they can increase the household income of local communities.

In the perspective of tourism destination planning, the diversity of ornamental plants in the homegarden is an important component in developing an appropriate location plan for ecotourism (sustainable tourism). The existence of several plant species has the potential to build authenticity as a key to destination competitiveness. It also has a key role in the conservation programs of rare and endangered plant species (Hakim and Nakagoshi, 2007). In various tourist spots, homegarden are important instruments in tourism accommodation, for example: homestays. Homestay frequently highlight plant diversity in the homegarden (Hakim and Nakagoshi, 2014). Tourism helps improve the socioeconomic community (Ibrahim et al., 2019).

From the perspective of tourism product development, the biocultural attributes of cultural landscapes can be appreciated, including their uniqueness and naturalness (Kikuchi et al., 2014). Seeing the unique cultural landscape is an authentic experience. The naturalness of the cultural landscape mainly depends on the abundance of green areas (vegetation) and the lack of modern man-made buildings. From the perspective of the tourism market, unique and extraordinary cultures can become tourism products that can be consumed or enjoyed by tourists. There are many tourism products in the cultural landscape, ranging from agricultural tourism to local culinary products. Recreational activities are very close to the attractions which are the core and magnet of the destination (Hakim, 2017).

The scientific approach supports tourism managers in defining tourism products and needs to pay attention to several important things. The first, knowledge, perception, and principles

of sustainable farmer life. Understanding how farmers use natural resources in a sustainable manner is critical to determining the stories behind cultural landscapes. Second, understanding the diversity of vegetation in cultural landscapes will facilitate the development of various tourism products, such as fruit harvest times, festivals, and specific plant-based culinary delights. It is also important to promote biodiversity mapping and exploration and provide understandable explanations to tourists. Third, investigate and compile data on the physical characteristics of land, fruit and vegetables, and provide understandable explanations. This can be the basis for better observation for tourists, appraising nature, and appreciation of the experience of harvesting, and enjoying local food (Hakim, 2017).

Based on these various things, several strategies for developing sustainable tourism based on cultural landscapes in rural area around Mandalika, Lombok Island, namely: 1) ensuring that all stakeholders have the same understanding and appreciation for promoting sustainable tourism based on cultural landscapes; 2) ensure that development (related to tourism, infrastructure, housing, etc.) supports and strengthens the authenticity of the cultural landscape; 3) minimize negative environmental impacts, enforce land use policies, and strengthen site management and monitoring through collaborative and participatory efforts; 4) Empowering local communities to be directly involved in sustainable tourism to improve their welfare; and 5) Promote the development of sustainable tourism products and services that respect local cultural values, protect landscapes, and conserve biodiversity.

## Conclusion

The area inhabited by the Sasak tribe around Mandalika is a rural area with distinctive pattern of spatial organization. This area forms the diversity of cultural landscape consisted of ricefield (bangket), settlement (gubuk) and homegarden (leah), meadow (gumi pupak), garden (kebon), forest (gawah) and sacred area (simbit). Research findings indicate that the cultural landscape of the Sasak tribe in rural area around Mandalika, Lombok Island is the traditional settlements that are built and depend on the biodiversity and its environment. Sasak people in the rural area around Mandalika, Lombok Island, still maintain the cultural traditions. Through their involvement in rural area around Mandalika, Lombok Island, the Sasak people can carry out the preservation of their cultural landscape. The development of cultural landscape as sustainable tourism can play an important role in preserving regional cultural values as a national cultural asset, preserving plant diversity and landscape, and improving the welfare of local communities.

Conflict in Interest: There is no Conflict in Interest

## Acknowledgements

The authors would like to thank Center for Higher Education Funding (Balai Pendanaan Pendidikan Tinggi, BPPT), The Ministry of Education, Culture, Research, and Technology of The Republic of Indonesia and Educational Fund Management Institution (Lembaga Pengelola Dana Pendidikan, LPDP) which have provided Indonesia Education Scholarship (Beasiswa Pendidikan Indonesia, BPI). I would also like to thank my supervisors for their patience in guiding me and all institutions, informants and all of them who participated in and supported this research.

## References

Abdoellah, O.S., Schneider, M., Nugraha, L.M., Suparman, Y., Voletta, C.T., Withaningsih, S., Parikesit, Heptiyanggit, A. and Hakim, L. (2020). Homegarden Commercialization: Extent,

- Household Characteristics, and Effect on Food Security and Food Sovereignty in Rural Indonesia. *Sustainability Science*, 15: 797–815.
- Adhika, I.M. and Putra, I.D.G.A.D. (2020). Reinvigorating Cultural Landscapes for Planning Cultural Tourism in Bali. *GeoJournal of Tourism and Geosites*, 33 (4): 1462-1469.
- Alelang, I.F., Hakim, L., and Batoro, J. (2018). The Ethnobotany of Abui's Homegardens and its Potentiality to Support Rural Tourism Development in Alor, Indonesia. *Journal of Indonesian Tourism and Development Studies*, 2: 120-125.
- Alouw, J.C. and Wulandari, S. (2020). Present Status and Outlook of Coconut Development in Indonesia. *IOP Conf. Series: Earth and Environmental Science*, 418: 012035.
- Altaba, P., García-Esparza, J.A. and Valentín, A. (2022). Assembling Cultural and Natural Values in Vernacular Landscapes: An Experimental Analysis. *Remote Sensing*, 14: 4155.
- Arif, A.S. (2019). Variety of Cultural Landscape as the Identity of Indonesia. *ACLA - IFLA CL WG International Workshop 'Cultural Landscapes vis-à-vis Sacred Places: Exposing National Identity'*. Seoul: Asia Center, Seoul National University.
- Ashrafi, M. and Shokrani, M. (2018). ICOMOS-IFLA Principles Concerning Rural Landscapes as Heritage. *Research Institute of Cultural Heritage and Tourism*, 39 (80): 3-14.
- Atik, D. and Erdoğan, N. (2017). A Model Suggestion for Determining Physical and Socio-Cultural Changes of Traditional Settlements in Turkey. *ITU Journal of The Faculty of Architecture*, 14 (2): 81-93.
- Babai, D., Jánó, B. and Molnár, Z. (2021). In the trap of interacting indirect and direct drivers: the disintegration of extensive, traditional grassland management in Central and Eastern Europe. *Ecology and Society*, 26 (4): 6.
- Batoro, J. (2021). Ethnobotany of Local Corn (*Zea mays* L.) in Ngawu Sub-Village, Tosari District, Pasuruan Regency, East Java, Indonesia. *Journal of Southwest Jiaotong University*, 56 (6): 610-615.
- Budiono, A., Prayudhi, A., Kusumosusanto, W., Sulaiman, U.R., Akhdiat, D.A., Irawati, D. and Handayani, D.R. (2005). *Revitalization of Traditional Residential Environments*. Jakarta: Public Works Department.
- Directorate General of Estate Crops. (2018). *Tree Crop Estate Statistics of Indonesia 2017-2019*. Jakarta: Directorate General of Estate Crops.
- Eriksson, O. (2022). Coproduction of Food, Cultural Heritage and Biodiversity by Livestock Grazing in Swedish Semi-natural Grasslands. *Frontiers in Sustainable Food Systems*, 6: 801327.
- Farina, A. (2000). The Cultural Landscape as a Model for the Integration of Ecology and Economics. *BioScience*, 50 (4): 313-320.
- Feng, Y. and Long, H. (2020). Progress and Prospects of Spatial Reconfiguration of Rural Settlements in Mountainous Areas of China. *Progress in Geography*, 39 (5): 866-879.
- Frederick, W.H. and Worden, R.L. (2011). *Indonesia: a country study*. Washington: Federal Research Division.
- Government of the Republic of Indonesia. (2014). *Regulation of the Government of the Republic of Indonesia No. 52 Year 2014 about The Mandalika Special Economic Zone*. Jakarta: Government of the Republic of Indonesia.
- Gunawan, A., Edison, F.M., Mugnisjah, W.Q., Utami, F.N.H. (2019). Indonesian Cultural Landscape Diversity: Culture-Based Landscape Elements of Minangkabau Traditional Settlement. *International Journal of Conservation Science*, 10 (4): 701-710.
- Hakim, L. (2011). Cultural landscapes of the Tengger Highland, East Java. In: S.K. Hong et al (eds) *Landscape ecology in Asian Cultures*: 69-82. Tokyo: Springer.
- Hakim, L. (2014). *Ethnobotany and Homegarden Management: Food Security, Health and Agrotourism*. Malang: Selaras.

- Hakim, L. (2017). Cultural Landscape Preservation and Ecotourism Development in Blambangan Biosphere Reserve, East Java. *Landscape Ecology for Sustainable Society*, 341-358. Tokyo: Springer.
- Hakim, L. and Nakagoshi, N. (2007). Plant species Composition in Home gardens in the Tengger Highland (East Java Indonesia) and its Importance for Regional Ecotourism planning. *Hikobia*, 15: 23-36.
- Hakim, L. and Nakagoshi, N. (2014). Ecotourism and Climates changes: the ecolodge contribution in global warming mitigation. *Journal of Tropical Life Science*, 4 (1): 26-32.
- He, Y., Chen, C. and Chou, R. (2019). The Key Factors Influencing Safety Analysis for Traditional Settlement Landscape. *Sustainability*, 11 (12): 3431.
- Hebbar, K.B., Abhin, P.S., Sanjo Jose, V., Neethu, P., Santhosh, A., Shil, S. and Prasad, P.V.V. (2022). Predicting the Potential Suitable Climate for Coconut (*Cocos nucifera* L.) Cultivation in India under Climate Change Scenarios Using the MaxEnt Model. *Plants*, 11: 731.
- Henderson, A. (2009). *Palms of Southern Asia*. New Jersey: Princetown University Press.
- Hong, S.K., Lee, G.A., Cho, M.R., Kim, J.E., Won, Y.T., Han, E.S., Park, H.Y. and Samantha, C.H. (2018). Interdisciplinary Convergence Research Design on Island Biocultural Diversity-Case Study in Wando-gun (County) Island Region, South Korea. *Journal of Marine and Island Culture*, 7 (1): 12-37.
- Howard, P. and Pinder, D. (2003). Cultural Heritage and Sustainability in the Coastal Zone: Experiences in South West England. *Journal of Cultural Heritage*, 4 (1): 57-68.
- Ibrahim, M.S.N., Ishak, M.Y. and Halim, S.A. (2019). The Impacts of Tourism Development on Community Well-being in Langkawi: The Case of Kampung Padang Puteh, Mukim Kedawang. *Journal of Marine and Island Culture*, 8 (2): 61-88.
- Ickowicz, A. and Moulin, C.H. (2023). *Livestock grazing systems and sustainable development in the Mediterranean and Tropical areas*. Versaille: Éditions Quæ.
- Igic, M., Mitkovic, P., Dinic-Brankovic, M., Dekic, J. and Mitkovic, M. (2017). Spatial and Functional Structure of Rural Settlements in Municipalities of Niš. *Facta Universitatis Series: Architecture and Civil Engineering*, 15 (1) Special Issue: 85-101.
- International Plant Names Index. (2023). International Plant Names Index. viewed 14 July 2023. <https://www.ipni.org/>
- Ismail, Y. (2021). Creating Sustainability Natural Tourism Destination. *GeoJournal of Tourism and Geosites*, 39 (4spl): 1331-1335.
- Izzah, L., Rochwulaningsih, Y. and Sulistiyono, S.T. (2021). Commodifying Culture in A Frontier Area: The Utilization of Madurese Culture for Developing Tourism in the Eastern Tip of Java Island, Indonesia. *Journal of Marine and Island Cultures*, 10 (1): 118-137.
- Janecek, V., Rada, P., Rom, J. Horak, J. (2019). Rural Agroforestry Artifacts in A City: Determinants of Spatiotemporally Continuous Fruit Orchards in An Urban Area. *Urban Forestry and Urban Greening*, 41: 33-38.
- Jung, H-J. and Ryu, J-H. (2015). Sustaining a Korean Traditional Rural Landscape in the Context of Cultural Landscape. *Sustainability*, 7 (8): 11213-11239.
- Khanal, S., Khanal, D. and Kunwar, B. (2019). Assessing the Structure and Factors Affecting Agrobiodiversity of Home Garden at Katahari Rural Municipality, Province 1, Nepal. *The Journal of Agriculture and Environment*, 20: 129-143.
- Kikuchi, Y., Sasaki, Y., Yoshino, H., Okahashi, J., Yoshida, M. and Inaba, N. (2014). Local visions of the landscape: participatory photographic survey of the world heritage site, the rice terraces of the Philippine Cordilleras. *Landscape Research*, 39 (4): 387-401.
- Lehmann, A. and Stahr, K. (2010). The Potential of Soil Functions and Planner-Oriented Soil Evaluation to Achieve Sustainable Land Use. *Journal of Soils and Sediments*, 10 (6): 1092-1102.

- Maestre, F.T., Le Bagousse-Pinguet, Y., Delgado-Baquerizo, M., Eldridge, D.J., Saiz, H. and Berdugo, M. (2022). Grazing and ecosystem service delivery in global drylands. *Science*, 378: 915–920.
- Mayasari, M., Antariksa, and Wulandari, L.D. (2023). Cultural Landscape of Minangkabau Traditional Settlement in Nagari Sijunjung Traditional Settlement. *International Journal of Architecture, Arts and Applications*, 9 (1): 6-13.
- Mibtadin, Rosidin, Rachmadhani, A., Khalikin, A., Reslawati, Suhanah, Isnanto, M. and Najib. (2023). Ruwahan Tradition, Spiritual Balance, and Religious Expression of Javanese People. *Migration Letters*, 20 (3): 534-550.
- Nilson, T. and Thorell, K. (2018). *Cultural Heritage Preservation: The Past, the Present and the Future*. Halmstad: Halmstad University Press.
- Pan, S-Y., Gao, M., Kim, H., Shah, K.J., Pei, S-L. and Chiang, P.C. (2018). Advances and challenges in sustainable tourism toward a green economy. *Science of the Total Environment*, 635: 452-469.
- Pora, M.P, Setyabudi, I., and Alfian, R. (2022). Study of Architecture and Cultural Landscape of the Dhawe Tribe, East Nusa Tenggara. *Local Wisdom*, 14 (1): 1-17.
- Rahmi, D.H. and Setiawan, B. (2021). Selokan Mataram in Yogyakarta as a Cultural Landscape: Heritage Values and Pressures. *IOP Conference Series: Earth and Environmental Science*, 879: 012012.
- Rahu, A.A., Hidayat, K., Ariyadi, M. and Hakim, L. (2013). Ethnoecology of Kaleka: Dayak's Agroforestry in Kapuas, Central Kalimantan Indonesia. *Research Journal of Agriculture and Forestry Sciences*, 1 (8): 5-12.
- Rejekiningrum, P., Apriyana, Y., Sutardi, Estiningtyas, W., Sosiawan, H., Susilawati, H.L., Hervani, A., and Alifia, A.D. (2022). Optimising Water Management in Drylands to Increase Crop Productivity and Anticipate Climate Change in Indonesia. *Sustainability*, 14: 11672.
- Rilatupa, J. and Mangani, K.S. (2020). Forensic Analysis of Cultural Heritage Building Maintenance. *Journal of Southwest Jiaotong University*, 55 (4): 1-9.
- Rocha, C.S., Rocha, D.C., Kochi, L.Y., Carneiro, D.N.M., Dos Reis, M.V., and Gomes, M.P. (2022). Phytoremediation by ornamental plants: A beautiful and ecological alternative. - *Environmental Science and Pollution Research*, 29: 3336-3354.
- Rössler, M. and Lin, C.H. (2018). Cultural Landscape in World Heritage Conservation and Cultural Landscape Conservation Challenges in Asia. *Built Heritage*, 2: 3-26.
- Saadi, Y. (2013). Post-construction problems of embung in lombok island and the operation and maintenance works. *Procedia Engineering*, 54: 648-660.
- Safitri, D.A., Ahmad, A. and Nathan, M. (2021). Study of Soil Management in Ricefields in Bantimurung District Maros Regency. *IOP Conf. Series: Earth and Environmental Science*, 807: 042008.
- Salameh, M.M., Touqan, B.A., Awad, J. and Salameh, M.M. (2022). Heritage Conservation as A Bridge to Sustainability Assessing Thermal Performance and The Preservation of Identity Through Heritage Conservation in The Mediterranean City of Nablus. *Ain Shams Engineering Journal*, 13 (2): 101553.
- Santiago, J. and Buot, I. E. (2018). Conceptualizing the Socio-Ecological Resilience of the Chaya Rice Terraces, a Socio-Ecological Production Landscape in Mayoyao, Ifugao, Luzon Island, Philippines. *Journal of Marine and Island Culture*, 7 (1): 107-126.
- Sathyaseelan, N. and Ravi, B. (2022). Coconut Planting and After Care. *Indian Coconut Journal*, 2022: 20-25.
- Setijanti, P., Defiana, I., Setyawan, W., Silas, J., Firmaningtyas, S. and Ernawati, R. (2015). Traditional settlement livability in creating sustainable living. *Procedia Social and Behavioral Sciences*, 179: 204–211.

- Setyawati, T., Narulita, S., Bahri, I.P. and Raharjo, G.T. (2015). *A Guide Book to Invasive Alien Plant Species in Indonesia*. Bogor: Research, Development and Innovation Agency, Ministry of Environment and Forestry of Indonesia.
- Setyowati, Rahayu, E.S., Irianto, H. and Sutrisno, J. (2023). Production and Price Risk Analysis of Shallot (*Allium Stipitatum* Regel) Cultivation Among Farm Households in Brebes District, Indonesia. *Applied Ecology and Environmental Research*, 21 (3): 2625-2640.
- Shen, J. and Chou, R. (2021). Cultural Landscape Development Integrated with Rural Revitalization: A Case Study of Songkou Ancient Town. *Land* 10: 406.
- Singh, A. and Samant, S.S. (2010). Conservation Prioritization of Habitats and Forest Communities in The Lahaul Valley of Proposed Cold Desert Biosphere Reserve, North Western Himalaya, India. *Applied Ecology and Environmental Research*, 8 (2): 110-117.
- Solossa, A.H., Soemarno, I.R., Sastrahidayat and Hakim, L. (2013). Homegarden of the local community surrounding Lake Ayamaru, West Papua Province, and its consequences for tourism development and lake conservation. *Journal of Biodiversity and Ecological Conservation*, 3 (3): 1-11.
- Sukenti, K., Hakim, L., Indriyani, S. and Purwanto, Y. (2019). Ethnobotany of Sasak traditional beverages as functional foods. *Indian Journal of Traditional Knowledge*, 18 (4): 775-780.
- Sukenti, K., Hakim, L., Indriyani, S., Purwanto, Y. and Matthews, P.J. (2016). Ethnobotanical study on local cuisine of the Sasak tribe in Lombok Island, Indonesia. *Journal of Ethnic Foods*, 3: 189-200.
- Sullivan, S. and Mackay, R. (2012). *Archaeological Sites: Conservation and Management*. Los Angeles: The Getty Conservation Institute.
- Sunarta, I.N., Suyarto, R., Saifulloh, M., Wiyanti, W., Susila, K.D., and Kusumadewi, L.G.L. (2022). Surface Urban Heat Island (SUHI) Phenomenon in Bali and Lombok Tourism Areas Based on Remote Sensing. *Journal of Southwest Jiaotong University*, 57 (4): 504-521.
- Tarolli, P., Rizzo, D., and Brancucci, G. (2019). Terraced Landscapes: Land Abandonment, Soil Degradation, and Suitable Management. In: Varotto, M., Bonardi, L., Tarolli, P. (eds) *World Terraced Landscapes: History, Environment, Quality of Life*. Environmental History, 9. Cham: Springer.
- The Central Bureau of Statistics for Central Lombok Regency. (2022). *Central Lombok Regency in Figures 2022*. Praya: The Central Bureau of Statistics for Central Lombok Regency.
- UNESCO. (2008). *Operational Guidelines for The Implementation of The World Heritage Convention*. Paris: UNESCO World Heritage Centre.
- Untari, S. and Suharto, Y. (2020). The Development of Youth and Woman Entrepreneurship Program in Village Tourism Through Partnership. *GeoJournal of Tourism and Geosites*, 33 (4spl): 1538-1544.
- Van Steenis, C.G.G.J. (2008). *Flora for schools*. Jakarta: Penebar Swadaya.
- Wu, Y., Wang, H., Wang, Z., Zhang, B. and Meyer, B.C. (2020). Knowledge mapping analysis of rural landscape using citespace. *Sustainability*, 12 (1): 66.
- Yang, Q., Duan, X., Wang, L. and Jin, Z. (2018). Land use transformation based on ecological-production-living spaces and associated eco-environment effects: A Case Study in the Yangtze River Delta. *Scientia Geographica Sinica*, 38 (1): 97-101.